

**PROCEEDINGS ON MULTI-SECTORAL
CONFERENCE ON DAIRY DEVELOPMENT
STRATEGIES IN THE PHILIPPINES**

1986



Published by
THE ACADEMY
Bicutan, Taguig, Metro Manila
Philippines

**PROCEEDINGS ON MULTI-SECTORAL
CONFERENCE ON DAIRY DEVELOPMENT
STRATEGIES IN THE PHILIPPINES**

1986



Published by
THE ACADEMY
Bicutan, Taguig, Metro Manila
Philippines

National Academy of Science and Technology
Bicutan, Taguig, Metro Manila
Philippines

Copyright 1987 by
The National Academy of Science and Technology

All Rights Reserved

No part of this book may be reproduced without written permission from the Academy, except for brief excerpts or quotations in connection with the text of a written paper or book.

ISBN 971-8538-16-X

Printed in
THE REPUBLIC OF THE PHILIPPINES

**THE PHILIPPINE DAIRY INDUSTRY:
AN AGENDA FOR ACTION**

**Executive Report
of the Multi-Sectoral Workshop
on Problems and Prospects of the
Philippine Dairy Industry**

- Workshop I – Oct. 17, 1986, UPLB Union, Los Baños “Status, Problems, Issues of the Philippine Dairy Industry”
- Workshop II – Oct. 23, 1986, NAST, Bicutan “Support Systems for the Dairy Industry”
- Workshop III – Oct. 30, 1986, PCARRD, Los Baños “Government Thrusts and Programs for the Dairy Industry”
- Symposium on Dairy Development
in the Philippines – April 2, 1987, Asian Institute of Tourism,
Diliman, Quezon City

TABLE OF CONTENTS

	Page
Introduction	
Rationale of Workshop	v
Highlights	
Problems/Needs/Plausible Solution	vi
Production	
Processing	
Marketing	
Support Systems to Hasten Dairy Development	viii
Production	
Processing	
Marketing	
Recommendations	ix
Production	
Processing	
Marketing	
Executive Summary	xii
Imperatives	
Prospects and Potentials	
Workshops Recommendations	
Indorsement	

EXECUTIVE REPORT

“Multi-Sectoral Conference on Dairy Development Strategies in the Philippines” October 17, 23 and 30, 1986

Introduction

Rationale of the Workshop

The numerous programs, projects and activities aimed at increasing the local milk production through government and private sector involvement have not reduced meaningfully our dependence on imported milk and dairy products. In 1985, the Philippines imported 82.3 thousand metric tons of milk and dairy products valued at US\$71.8 million representing 98 per cent of our domestic requirements.

Twenty-four years ago, the Dairy Training and Research Institute (DTRI) established to assist in promoting dairy industry development, was mandated to set directions and thrusts of the national dairy development efforts. In 1968, DTRI established the Los Baños Milk Collection Scheme covering the provinces of Laguna, Rizal and Cavite and in 1973 it was expanded to include Batangas and Quezon. Ten years later, DTRI turned-over the milk collection program to the KKK-Pilot Rural Dairy Project of the Ministry of Human Settlements. Noticeably, the Bureau of Animal Industry (BAI) had initiated such milk collection schemes in the provinces of Bulacan and Sorsogon. In 1979, the Philippines Dairy Corporation (PDC) was created by virtue of Batas Pambansa Blg. 21 to coordinate policies and programs of the national dairy industry.

In the private sector, a number of commercial and semi-commercial dairies have been established over the past years but not one of them survived except San Miguel Corporation's Magnolia Dairy Farm. The small farmer-cooperators of the Dairy Training and Research Institute, Bureau of Animal Industry and Kilusang Kabuhayan sa Kaunlaran-Pilot Rural Dairy Project are also involved in the industry. Also, 12 primary cooperatives in Laguna and Quezon were organized and federated into the Southern Tagalog Dairy Cooperative. Still, there are numerous dairy-based cottage industries that are operating.

Unfortunately, despite these efforts of both government and private sectors, the dairy industry remains underdeveloped. It is in this view that the multi-sectoral workshop on dairy development strategies in the Philippines, sponsored by the DTRI, the National Academy of Science and Technology, (the advisory body of the government in science and technology), the Bureau of Animal Industry and the

Philippine Genetics, Inc. was held to identify the real problems and seek or formulate plausible solutions.

The multi-sectoral workshop was held for three days in different places. In the first workshop, held in U.P. at Los Baños, the views of concerned sectors were gathered and at the same time identified the issues and problems. The second workshop held in NSTA, Bicutan, identified the support systems for a viable dairy industry. The third workshop held in PCARRD, Los Baños identified the needed national thrusts and programs for the dairy industry. Three working groups namely: Production, Processing and Marketing were organized.

Highlights of Workshop

Problems/Needs/Recommendations

A. Production Aspect

The workshop group on production identified the following needs/problems:

1. Re-orientation of policy-makers on the general concept and importance of dairying so that it becomes a priority program of the government.
2. Organization of strong extension and research services by tapping the existing dairy agencies and involving private groups as well as defining their roles and commitment.
3. Authorization of the Ministry of Agriculture and Food (MAF) particularly the Livestock Development Council (LDC) instead of the Ministry of Trade and Industry (MTI) to import dairy raw materials.
4. Adoption of the contract-farming system in dairying (which was found successful by Magnolia in their poultry ventures).
5. Involvement of women, children and retirees to engage in dairying.
6. Creation of a task force to expedite funding of dairy projects.
7. Oblige the private filled milk manufacturers to engage in dairy farming or to buy certain amount/percent of locally produced milk as a prerequisite and/or to limit importation of milk and milk products.
8. Increase ad valorem tax on imported milk and milk products, proceeds of which shall be used for dairy development.

B. Processing Aspect

The processing group identified the following problems:

1. Present market shares of local milk production is only 2%, 98% is dependent on imported raw materials broken down into 40% canned milk, 30% milk powder and 30% other dairy products. Within last year, even ready to drink milk are liberally coming into the country.
2. Poor quality milk produced by small holder dairies.

3. Inadequate processing technology at the village level due to lack of extension activities.
4. Lack of proper milk collection and storage facilities.
5. High milk processing inputs.
6. Lack of products diversification by small scale milk processors.
7. Inadequate storage facilities for finished products at the village level.
8. Milk and milk products caters only to the A and B markets.

The workshop group likewise identified the following needs:

1. Concentration of efforts in producing low cost milk and milk products incorporating locally produced milk.
2. Training and extension on proper milk handling and processing technologies.
3. Providing incentives on the production of quality milk.
4. Establishment of Philippine Standards (microbiological and chemical) for milk and milk products.
5. Provide appropriate milk collection and storage facilities.
6. Fabricate and utilize local dairy equipment and packaging materials.
7. Introduce developed appropriate technologies of dairy product other than the traditional ones.

C. *Marketing Aspect*

The marketing group identified the following constraints in the local market for milk:

1. Dumping price of milk powder.
2. Inaccurate data on local milk market.
3. Lack of dealer support in terms of storage facilities.
4. Low quality of local fresh milk due to lack of/or poor quality of education/training received by milkers.
5. Transforming present local milk into acceptable product lines.

The workshop group offered the following solutions:

1. Provide dumping shield – the government should ask industrial processors of milk and milk products to use local components.
2. Provide better information system.
3. Provide financial support for dairy distributors.
4. Provide better education for appropriate dairy technology.
5. Require industrial plants to absorb milk produced locally at realistic prices.
6. Disseminate technical information for processing raw milk into intermediate product.
7. Establish processing facilities at product sites.
8. Privatization of dairy operation.
9. Representation of dairy sector in government policy-making bodies.

Support Systems to Hasten Dairy Development

A. *Production Aspect*

The production group identified the following support systems/services needed:

1. **TRAINING:** production and milk handling, entrepreneurship, cooperative endeavors, leadership, and develop habit of milk drinking among school children through the inclusion of nutrition education with emphasis on milk in the school curriculum from kindergarten through grade school.
2. **CREDIT:** financing scheme for animals, infrastructure, equipment, subsistence and land rent.
3. **DIAGNOSTIC CENTERS:** for ruminant reproduction and other veterinary services.
4. **GOVERNMENT INCENTIVES AND SUBSIDIES:** assistance in establishing a realistic price policy for milk and milk products, animal dispersal, assistance in milk collection/marketing and assistance in organizing the farmers.
5. **FOREIGN AID ASSISTANCE:** ask European Economic Community and other dairy developed countries to give aid in terms of milk products from which the cooperative can generate funds for operation.
6. **RESEARCH:** allocation for dairy research funds and lifting dairy commodity to higher priority in the national research program.

B. *Processing Aspects*

The processing group identified the following support services to solve poor quality milk from the villages:

1. Review/update existing milk products standards by a designated group.
2. Develop low cost quality control method that can be done in the farm.
3. Create a body to do spot testing in the farm.
4. Put up training programs on quality control for technicians and farmers.
5. Intensify education campaign on the standard for milk and milk product quality, hygiene/sanitation, and proper processing.
6. Create a monitoring group and develop appropriate referral system.
7. Conduct research on pesticide residues, radioactive materials, heavy metals and other toxicants in milk.

Support systems to solve the problem on too much dependence on imported dairy processing equipment:

1. Design and fabricate appropriate equipment and facilities through research linkage with NIST, inventor's society and other groups.
2. Learn equipment design from neighboring countries like India.

Support systems to solve problems for need of more product development:

1. Develop technologies for milk and milk products processing for household level in cheese, butter flavor, milk drinks, dessert, confectionaries, etc.
2. Develop new low-cost milk-based product.

Support system to solve lack of information dissemination and technology transfer:

1. Develop information education materials on above technologies, recipes, health and nutrition information, and develop household small scale livelihood project for milk products.

Support systems to solve the problem regarding local market being flooded with dumping priced imported milk and milk products:

1. Political will of government to resist overflowing local market with imported milk and milk products.
2. Limit importation by requiring local processors to buy locally produced milk.

C. *Marketing Aspect*

The marketing group identified the following support systems to solve the identified problems:

1. Interface with filled milk sector.
2. Intensify information drive.
3. Strengthen marketing strategies to include:
 - a) review of existing product lines and identification of potential or new product.
 - b) transformation of these products into acceptable forms/packaging.
 - c) expansion of market base to include immediate and provincial center and provision of technical support.
 - d) strong government support to dairy marketing.
4. Provide credit facilities for small scale processors/marketers.
5. Development of an efficient Management Information System (MIS).
6. Phasing out government involvement in business operation and turn-over of the same to the farmers.

Recommendations

A. *Production Aspect*

The production group strongly feels the need to strengthen research and development as the government's main thrust to hasten dairy development in the Philippines.

The research thrusts shall be towards strengthening on farm research, establishment of dairy farm modules based on size of herd/by farm/by area/local cropping system, technology verification of researches identified by PCARRD for:

breed and strain improvement, reproduction and physiology, nutrition, management, dairy cattle diseases and parasites.

1. The development thrusts shall be towards strengthening and improving the dairy animal dispersal scheme, veterinary services, artificial insemination and implementing an effective support systems such as: technology assessment to include benchmark survey on farmer's felt needs in areas identified for dairy development and data on destruction rate of dairy animal and technology generation on AI, breeding and physiology.
2. Adoption of mature technologies on the following:
 - use of milk replacer for calf raising
 - zero grazing for dairy animals
 - use of urea as NPN source at the rate of 1% of concentrate ration
 - proper milk handling at village level
 - use of Zebu x Holstein crosses
 - urea-molasses mineral block
 - use of dried poultry manure for dairy cattle
 - supplementation of rice straw with ipil-ipil and dried poultry manure
 - backyard silage making

B. *Processing Aspect*

The processing group recommended the following:

1. Develop an integrated national program for technology generation, transfer and adoption and creation of a coordinating body to oversee/monitor the different programs/activities.
 - a. Review/update existing milk product standards.
 - b. With the huge importation of milk and milk products and the present policy on import substitution, R and D activities, training, nutrition education, and extension in dairy technology must be given top priority.
 - c. Develop low cost and appropriate quality control testing methods and facilities applicable to the village level.
 - d. Oversee the optimum utilization of dairy products received as food and minimize wastage.
2. Formulate a policy to give incentives to local dairy producers and processors to increase local milk production and decrease importations of milk and milk products.
 - a. Give premium for high quality milk.

- b. Provide low-cost locally fabricated milk processing equipment and facilities.
 - c. Provide incentives to the development of low-cost and new products processing technologies.
 - d. Give recognition to outstanding men and women in the dairy industry.
3. The government should provide the necessary budgetary allocation to support the above-mentioned provisions.

C. Marketing Aspect

The Marketing group recommended the following:

1. Require industrial milk plants to buy local milk.
 - Corollary to this are:
 - Tariff to support local dairy development
 - Defining a ratio between local and imported milk
 - ... Local milk must be sourced from local producers, or if not possible, the plants should set up their own dairy farms.
 - ... An interfacing mechanism to effect the importation of local milk into industrial plants should be set up. The mechanism should consider the quantity, quality and price of locally produced milk. In the event of disagreements about these aspects, the decision should be made in favor of the local producers.
2. Encourage the production of good quality milk thru the provision of funds for training, information services, milk collection and chilling facilities and adoption of premium pricing for quality milk.
3. Encourage and support farmer cooperatives/organizations to undertake marketing and other dairy-related activities with the end in view of having the coops of the said enterprises.
4. Pricing strategies of the government should be such that it will not unduly undermine the private sector, specifically the small producers.
5. Import restriction on selected dairy products:
6. Government support to marketing shall consist of the following:
 - a. market information services
 - b. credit for dealers
 - c. tax incentives for sales outlets
 - d. advertising and promotion strategies.
7. Establish an efficient monitoring and evaluation system for the dairy industry starting with a definite and comprehensive benchmark on the status of the industry.

Executive Summary

In the workshops, the following dairy industry status were gathered:

1. continuing dependence on imported powder milk:
2. malnutrition problem particularly for pre-school children:
3. foreign exchange cost amounts to millions of dollars annually; and
4. the priority to develop the rural sector under which dairy production had proven to be a viable involvement of farmers.

On the other hand, there are definite and strong prospects/potentials for development such as:

1. the presence of a substantial number of cattle, carabao and goats in the rural areas;
2. the acceptance of the idea by the small-holder farmers and their participation in the dairy productions;
3. the untapped potentials for feeds and fodder and the existence of marginal agricultural lands, crop residues, by-products and other marginal areas; and
4. the presence of the technical infrastructure which can be developed by milk collection systems, chilling and processing facilities; and
5. the presence of a gradually emerging marketing work.

The workshops therefore recognize that the development of the dairy industry is critical, and it can be done based on the present services, facilities and programs.

In general, the workshops recommend for the Philippine government to give highest priority to the development of the local dairy industry. This would require:

1. The continuation of the current programs including milk collection system and technical information support system in dairy development zones in Southern Tagalog, Central Luzon, Northern Mindanao, and Bicol areas.
 - a) Funds already programmed for dairy activities should be released
 - b) The current programs of lead agencies namely:
 - i. Bureau of Animal Industry (BAI)
 - ii. Dairy Training and Research Institute (DTRI)
 - iii. Philippine Dairy Corporation (PDC)

in this activity should continue.

This will require the release of loan funds under the Asian Development Bank and the International Fund for Agricultural Development (ADB/FAD) for the Philippine Smallholder Livestock Development Program (SLDP), for the BAI, DTRI and PDC.

- c) Incremental funds other than those already programmed are not needed.

2. The protection by the Philippine government of the fledgling industry through the imposition of gradually accelerating tariff on imported dairy products consumed by the high income group, the proceeds of which should be used to support the development of the dairy industry.
3. The striking of a harmonious balance between local production and imported ingredients for milk manufacture. This is necessary since in the present set-up the industrial milk plant is now absolutely dependent on imported milk powder.
4. The need for a continued support for the establishing of dairy co-operatives to handle production, processing and marketing of locally produced milk.
5. The need to establish a dairy coordinating body whereby all government and private sectors involved in the industry shall participate with particular emphasis on the representation of smallholder producers in the body along with the creation of an atmosphere conducive to the participation of private and commercial enterprise.
6. The continuation of support for research and development designed to develop a local dairy type of animal, the establishment of specification and standards of optimal conditions for production, processing and marketing.

Indorsement

In this light, the workshops earnestly request from the Philippine government, through the Minister of Agriculture and Food its strong commitment to and support for the development of a local dairy industry, consistent with its concerns for rural development, food security, economic recovery and national self reliance.

TABLE OF CONTENTS

	Page
Introduction	1
Adoption of the Agenda	2
Working Groups	2
Programme	2
Conclusion and Recommendations	3
Welcome Address	7
Raul P. de Guzman Chancellor, University of the Philippines, Los Baños	
Introductory Papers	
Rationale of the Workshop/Symposium	9
Dr. Franklin D. Aglibut Director, Dairy Training and Research Institute	
Workshop Mechanics and Procedures	11
Dr. Felix Librero Chairman, Department of Development Communications University of the Philippines, Los Banos	
Status of the Philippine Dairy Industry	12
Noemi K. Torreta Division Chief, Philippine Dairy Corporation	

WORKSHOP PAPERS ON PROBLEMS AND ISSUES OF THE PHILIPPINE DAIRY INDUSTRY, October 17, 1986, UPLB UNION

“Dairying as a Business Enterprise: Experiences and Problems”	
– The Magnolia Dairy Farms	17
Ricardo G. Acabado	
– The Monterey Farms, Inc.	21
Arturo Tolentino	
– The Aberdeen Farms, Inc.	23
Antonio Zuniga	
– The Magnolia Dairy Products Plan	26
Conrado Nievera	

“Dairying on a Smallhold Level”	
The PDC Experience	29
Adolfo Gabatino, Southern Tagalog Dairy Cooperative	
Invitational Paper	
The Guarantee Fund for Small and Medium Enterprise	32
Jesus Tirona	
Plenary Session	38
WORKSHOP PAPERS ON SUPPORT SYSTEMS FOR A VIABLE DAIRY INDUSTRY, October 23, 1986, NSTA Executive Lounge, Bicutan	
Introduction	43
Welcome Address	
Dr. Melecio S. Magno	44
Vice President, National Academy of Science and Technology	
Workshop Papers	
The Nutritional and Health Aspect of the Dairy Industry	45
Dr. Lina E. Manapsal, Ministry of Health, delivered by Dr. Estrella Payumo	
Importance of Fresh Milk to Infant and Growing Children	58
Dr. Rodolfo Florentino delivered by Dr. Stella Marie Gonzales, FNRI	
Research and Development in Dairy Production	66
Dr. Alberto Y. Robles, DTRI	
Research and Development in Dairy Technology	74
Dr. Clara L. Davide, DTRI	
Extension and Training Program for Dairy Development	82
Prof. Pedro O. Ocampo, DTRI	
Experiences in Advanced Breeding Technique	91
Mr. Joseph S. Serus, Jr., President, Philippine Genetics, Inc. delivered by Mr. Gerry Ledesma, PGI	
Invitational Papers	
Credit Program for Dairy Farmers	95
Dr. Pedrito T. Rabonza, DBP	
Dairy Industry and Dairy Cooperatives in India	103
Hon. Krishnam Raghunata delivered by Katar Singh	

Plenary Session	111
Workshop Report and Recommendations	

Closing Remarks	
Dr. Perfecto K. Guerero, NRCP	113

**WORKSHOP PAPERS ON GOVERNMENT THRUSTS AND PROGRAMS FOR
THE PHILIPPINE DAIRY INDUSTRY**

October 30, 1986, PCARRD, Los Banos, Laguna

Introduction	117
--------------------	-----

Welcome Address	
Dr. Patricio S. Faylon, PCARRD	117

Workshops Papers:

National Dairy Research and Development Program	119
---	-----

 Dr. Patricio S. Faylon, PCARRD

The Role of BAI on National Dairy Development	124
---	-----

 Mr. Jesus de Guzman, BAI

The Changing Role of LDC Circa 1986 to 1992	128
---	-----

 Dr. Vito F. del Fierro, LDC

DTRI's Thrusts and Programs for Dairy Development	131
---	-----

 Prof. Pedro O. Ocampo, DTRI

Concept Paper of a National Breeding Program	139
--	-----

 Dr. Edwin G. Wagelie, DTRI

Government Thrusts and Policies Towards Dairy Development	146
---	-----

 Atty. Dante Barboza, MAF

Plenary Session/Open Forum	149
----------------------------------	-----

Summary and Recommendations

Participants and Guests	150
-------------------------------	-----

Organizing, Steering and Working Committees	153
---	-----

SYMPOSIUM ON DAIRY DEVELOPMENT IN THE PHILIPPINES

April 2, 1987, AIT, Diliman, Quezon City

Welcome Address	156
-----------------------	-----

 Dr. Melecio S. Magno, NAST

Opening Remarks	158
-----------------------	-----

 Dr. Edwin Magallona, UPLB

Presentation of Workshop Recommendations	161
--	-----

 Dr. Dioscoro L. Umali, NAST

Workshop I

**STATUS, PROBLEMS AND ISSUES OF
THE PHILIPPINE DAIRY INDUSTRY**

UPLB UNION, 17 OCTOBER 1986

REPORT OF THE OCTOBER 17, 1986 WORKSHOP

Introduction

1. The Multi-sectoral Conference on Dairy Development in the Philippines was organized by the Dairy Training and Research Institute (DTRI) and the National Academy of Science and Technology (NAST) in cooperation with the Bureau of Animal Industry (BAI) and the Philippine Genetics, Inc. (PGI). The participation of both government and private enterprises engaged in dairy activities strengthened linkages (the Agricultural Credit and Cooperatives Institute (ACCI), the Development Bank of the Philippines (DBP), the Land Bank, the Guarantee Fund for Small and Medium Scale Enterprises (GFSME), the National Economic Development Authority (NEDA), the Philippine Dairy Corporation (PDC), the Philippine Council for Agricultural Research and Resource Development (PCARRD), the Magnolia Farms, the Aberdeen Farms, Inc., Monterey Farms) with the dairymen particularly the smallholder dairy farmers – the Southern Tagalog Dairy Cooperatives. The presence of private individuals, notably, the former Governor of Sorsogon, Juan Friyaldo and Rene Abad for Beth Day Romulo was also a great boost to the sectors concerned.
2. An Organizing and Steering Committee was created to formulate the Provisional Agenda and Timetable for the Conference. The general objective of the conference is stated rhetorically thus. . .
 - . . . political will,
 - . . . government support,
 - . . . institutional linkages,
 - . . . perseverance and continuity. These are the grains of a truly visible dairy industry – attainable only through a more cohesive programs of action by all concerned, hence this multi-sectoral workshop.
3. The first workshop was held Friday, 17 October 1986 at the UPLB Union Function Hall. The Chancellor of UP Los Baños, Raul P. de Guzman commended the organizers of the seminar-workshop.
4. The Rationale for the Workshop was delivered by Dr. Franklin B. Aglibut, Director, DTRI. The workshop mechanics was delivered by Dr. Felix B. Librero, Chairman of the Dept. of Dev. Communication of UPLB-CA.

Adoption of the Agenda

5. The conference noted that the Provisional Agenda and Timetable had been formulated with the intention:
 - a. to obtain the considered views of the participants as a group of government and private representatives engaged in dairying towards the main objective of **HASTENING DAIRY DEVELOPMENT IN THE PHILIPPINES**.
 - b. to identify "Issues and Problems on Dairying," elected as theme of Workshop I, October 17, 1986 at the UPLB Union, UPCA.
 - c. to identify "Support Systems for a Viable Dairy Industry," adopted as theme for Workshop II, October 23, 1986 at NSTA, Bicutan.
 - d. to unify "National Thrusts and Programs for the Dairy Industry," adopted as theme for Workshop III, October 30, 1986 at PCARRD, Los Baños, Laguna.
 - e. to come up with policy recommendations to be presented to the government at a symposium through the Minister of Agriculture and Foods, Hon. Ramon V. Mitra, Jr.

Working Groups

6. The conference established three workshop groups, namely: Group I – **PRODUCTION**, Group II – **PROCESSING** and Group III – **MARKETING**. The core group members were distributed to these disciplines considering their specialization and expertise. Expert consultants were free to join any group and were called upon by any group where their views were needed.
7. The reports of the working groups were considered in plenary; as a result, the workshop arrived at a number of conclusions and adopted a number of recommendations relevant to the topics discussed prior to the workshop.

Programme

8. The Programme for Workshop I included the following workshop papers:
 - A. **DAIRYING AS A BUSINESS ENTERPRISE**. Experiences and Problems presented by the following speakers:
 - i. Ricardo Acabado
Manager, Magnolia Dairy Farm
Alfonso, Cavite City
 - ii. Arturo Tolentino
Manager, Monterey Farms, Inc.

- iii. Antonio Zuniga
Aberdeen Farms, Inc.
- iv. Conrado Nievera
Magnolia Dairy Products Plant

B. DAIRYING ON A SMALLHOLD LEVEL: The PDC Experience

Adolfo Gabatino
President, Southern Tagalog Dairy Cooperatives
Sta. Cruz, Laguna

Each topic presentation was followed by an Open Forum.

9. An invitational paper on **GUARANTEE FUND FOR SMALL AND MEDIUM ENTERPRISE** was delivered by Jesus Tirona, Managing Director, GFSME.

Conclusions and Recommendations

10. The production group agreed that the strategies/approaches to make a dairy enterprise viable are:

- a. Re-orientation on the general concept of dairying among policy makers. The workshop agreed to come-up with a position paper considering all aspects of dairying, namely: production, processing and marketing to convince the policy makers to elevate dairy as a priority program with support of farmer organizations.
- b. Organizing strong extension services and research by:

tapping existing agencies and involving new ones: the two dairy zones now identified are the Southern Tagalog and Northern Mindanao region with 2,500 dairy farmers. The role of each agency involved has to be defined.

The Southern Tagalog (S.T.) region shall have the following government agencies involved: PDC, BAI, PTC-RD, Regional-MAF, NABC, NKKK, PGI, NEDA, banks and institutions as UPLB, Bicol Univ., CSSAC. The non-government agencies found in the region are PBSP, SMC (MDF), HPI, MFC.

The Northern Mindanao (N.M.) region shall involve the same government agencies as in the Southern Tagalog region. The institutions are Xavier Univ., CMU and the non-government agencies are PBSP, SMC (MDF), HPI, MFC, PPC, Vitarich, Nestle.

- c. Authorizing the Ministry of Agriculture and Food, the LDC in particular to import dairy raw materials instead of the Ministry of Trade and Industry.

- d. Adoption of the “contract-farming system” as practiced by Magnolia both to smallhold and commercial farms.
 - e. Tap women, children and retirees to engage in dairying – train them as to:
 - * feeding management
 - * sanitation
 - * milking techniques
 - * milk handling probably processing
 - f. To come-up with programs by creating a task force for possible funding.
 - g. Compel/oblige the private filled milk manufacturer to engage in dairy farming or to buy certain amount/percent of locally produced milk as a pre-requisite in importing milk and milk products.
 - h. Increase ad valorem tax on imported milk and milk products. (long term plan with the hope that farmers will then be encouraged to produce for themselves).
11. The processing group presented the status of the industry and identified problems being encountered and listed them as follows:

Status and Problems:

- Present market shares of milk and milk products
 - 40% canned milk (filled evaporated and sweetened condensed)
 - 30% milk powder
 - 30% other dairy products, cheeses, ready to drink milk
- Poor quality of milk produced at the village level, etc.
- Inadequate processing technology at the village level due to lack of extension activities.
- Lack of proper milk collection and storage facilities since milk is highly perishable.
- High milk processing inputs.
- Lack of product diversification by small scale milk processors.
- Inadequate storage facilities for finished products at village level.
- Milk and milk products cater only to the A and B markets.

The workshop proposed solutions and recommendations as follows:

For problems 1, 7 & 8, concentration of efforts in the production of low cost milk and milk products incorporating locally produced milk.
For problems 2 & 3

- i) training and extension on proper milking, milk handling and processing technologies

- ii) provision of incentives on the production of quality milk
- iii) establishment of Philippine standards (micro and chem) for milk and milk product

For problem 4

- i) provision of appropriate milk collection and storage facilities
- ii) fabrication and utilization of local dairy equipment and packaging material
- iii) introduction of developed appropriate technologies for dairy products other than traditional products e.g. kesong puti, pastillas de leche

12. The marketing group decided that in order to come up with recommendations, policies and programs to effectively market dairy products, the workshop tried a problem-analysis approach with the use of the 5 W's – What, When, Where, Why and Who. The identified constraints in the local market for milk includes the following:

- a. dumping
- b. inaccurate data on local milk market
- c. lack of dealer support in terms of storage facilities
- d. low quality of local fresh milk due to lack of or poor education /training of milkers and
- e. the problem of transforming the local milk into acceptable product lines.

Faced with these constraints the following recommendations were forwarded:

- a. Provision of dumping shield – the government should be asked to require utilization of local component by all milk companies.
- b. Provide a better information system – that is, accurate data must be provided by the government
- c. Provide financial support for dairy distributors, i.e. A/R financing, soft loans by GFSME, IGLF and Quedan-NFA financing.
- d. Provide better education for better milking technology – this can be provided by BAI, PDC, DTRI, and model dairy farmers. Some guidelines on this may be provided by the production workshop.
- e. Milk companies should be requested to market milk produced by small and medium dairy farmers and help achieve required quality by providing technicians seminars, etc. and purchase of the milk at reasonable prices.
- f. Dissemination of technical information for processing raw milk into condensed and evaporated milk and encourage the establish-

ment of small facilities in production sites. Facilities may be provided by DTRI/Lamot, PDC, KKK, etc.

- g. All government agencies active in commercial dairy operations must eventually be turned over to basic dairy producers and dairy marketers as priority beneficiaries; and, finally,
- h. Dairy representation in government policy-making bodies.

Closing Remarks

- 13. Closing remarks was delivered by Dr. Dioscoro L. Umali, National Scientist. He thanked every participant for the way they conducted the workshop and pledged support for obtaining financing whether here or abroad as long as a development program results from the workshop/symposium.

WELCOME ADDRESS

Dr. Raul P. de Guzman

Chancellor, University of the Philippines, Los Baños

Dr. Magno, Dr. Banzon, Dr. Aglibut and other colleagues in the University of the Philippines at Los Baños, participants in this multi-sectoral conference on dairy development strategies in the Philippines, friends:

May I in behalf of the administration, the faculty and staff of the University of the Philippines at Los Baños extend to you all, particularly our guests, a warm welcome to this campus.

I was reading the statement given to me by Dr. Aglibut on the need and rationale for calling this multi-sectoral conference on dairy development in the Philippines. I was struck by the review of all the previous efforts to promote the dairy industry and the conclusion that was reached despite all the efforts, including the establishment of DTRI in UPLB and of the Philippine Dairy Corporation, despite the establishment of these institutions and of other efforts, it seems that not much progress has been achieved in the dairy industry.

I remember about a year ago when I attended a cocktail reception of the people in animal science in Manila and I asked: "What is really the situation in the dairy industry?" and they painted not too bright a picture about it and they also mentioned then the need to do something. I am glad you are making these efforts and I hope that the renewed efforts being made by our Dairy Training and Research Institute together with the National Academy of Science and Technology would lead to some visible signs of progress in the dairy industry.

As you know, within the UPLB campus we have identified certain institutes as Centers of Excellence. Some, of course, of these Centers of Excellence were given that label through an Executive Order issued by then President Marcos. That is how we got the Institute of Biological Sciences, the Institute of Chemistry, Institute of Mathematical Sciences and Physics to be given the title Centers of Excellence, like the National Institute of Physics in Diliman and the National Institute of Geological Sciences, also in Diliman.

Of course, within this campus we have older institutes which we have recommended to the Board of Regents for recognition as Centers of Excellence. These include the Institute of Animal Science, the Institute of Plant Breeding, National Crop Protection Center, Institute for Food Science and Technology and Farming Systems and Soil Resources Institute. At that time the College of Agriculture recommended also that DTRI be considered a Center of Excellence. Of course, DTRI is one of the older institutes in this campus having been established some 24 years ago. We are still reviewing the case of DTRI when Dr. Aglibut took over. He reiterated that in terms of the track record of DTRI, it might have a better

claim to being considered a center of excellence than, say, some other units either here or in Diliman. And I am pretty sure that this would serve as a challenge to the new DTRI leadership to indeed lay a good basis for a claim that DTRI should be a center of excellence. And my hope is that the efforts in DTRI in turn would get reflected in the dairy industry through some development and progress in that particular sector.

Let me just give one bit of information in this welcome address for those of you who are here not too often or for the first time. Let me tell you one effort that we are doing in Los Baños. We are now trying to formulate a project on university-community relations. Of course, we have efforts like what DTRI is doing. Right now in this campus there is also a seminar-workshop sponsored by our Agrarian Reform Institute together with Xavier University on preparing a research agenda for agrarian studies, as other institutes have been active in linking with government policy-makers, program implementors, the private sectors and NGO. We realize that in the university, we must reach out to other groups: government, private sectors and NGOs in our effort to be more relevant to meeting the needs and problems of the country.

And also along this line, we are trying to develop a model of university-community relations. We are making some plans here in the university to be of direct service to the people of the municipalities of Bay and Los Baños and the province of Laguna by organizing livelihood projects for them such as giving them instruction on ornamental growing, on seedlings production and other aspects.

We are also making some big plans for presentation to the national government like the establishment of a national Botanical Garden in the Mount Makiling area and the establishment of a national Zoological Garden.

We are preparing an urban development plan for this Los Baños – Bay area that has been referred to when President Aquino was here the other day, as the agricultural science city. And maybe this place some time in the future would not be only an agricultural science city in terms of academic institutions and research and training institutions, but would be an attractive place to visit with the presence of a botanical garden, a zoo, a Museum of Natural History and a few other attractions that would make Los Baños not only a destination for educators, scientists, but for the people in general.

With this, let me express the hope that you would have a fruitful dialogue in today's workshop and the succeeding workshops being organized these coming few days.

Thank you very much.

MULTI-SECTORAL CONFERENCE ON DAIRY DEVELOPMENT STRATEGIES IN THE PHILIPPINES

Franklin B. Aglibuf
Director, Dairy Training and Research Institute

Rationale

The growth and development of our dairy industry appears to be static. Despite the launching of numerous programs, projects and activities aimed at increasing local milk production through government and private sector involvement have not induced a pace of development towards reducing our dependence on imported milk and dairy products. In 1985 alone, the Philippines imported 82.3 thousand metric tons of milk and dairy products valued at US\$71.8 million. This represents about 98 per cent of our domestic requirements. What seems to exist now is a flourishing dairy processing industry which includes reconstitution and repacking of dairy imports.

The development of the dairy industry has been the ongoing concern of the Philippine government — its agencies and institutions. Twenty-four years ago, the Dairy Training and Research Institute (DTRI) was established to assist in promoting dairy industry development. Through research, the Institute provides the answers to some basic and applied problems of production and dairy technology. Through formal and informal methods of education, it develops the manpower needs at all levels to promote and sustain the industry. Through extension, it promotes awareness and adoption of improved dairy and related technologies. In addition, the Institute is mandated to assist in setting the directions and thrusts of our national dairy development efforts.

In 1968, the Los Baños Milk Collection Scheme was established by DTRI which covered the provinces of Laguna, Rizal and Cavite. In 1973, this was expanded to include Batangas and Quezon. Ten years later, DTRI turned-over the milk collection program to the KKK-Pilot Rural Dairy Project of the Ministry of Human Settlements. Prior to all these activities, however, the Bureau of Animal Industry had initiated such milk collection schemes in the provinces of Bulacan and Sorsogon.

In 1979, the Philippine Dairy Corporation (PDC) was created by virtue of Batas Pambansa Blg. 21 or more popularly known as the Dairy Industry Development Act of 1979. Its mission is to coordinate policies and programs of the national dairy industry. However, not long after that tearful February affair, the implementation of the plan of operations of the Corporation was suspended.

The private sector also has its own share in helping develop the country's dairy industry. A number of commercial and semi-commercial dairies have been established over the past years but only few are still flourishing and/or surviving.

Some of these pioneering dairy enterprises are: Yulo's Hardie Milk, Araneta's Grassland Farms, SMC's Magnolia Dairy Farm, Selecta Farms in Novaliches, the JALSOR Farms in Negros, Alonzo's Dairy Farm in Cebu, PPC Dairies in Bukidnon, Inigo's Dairy Farm in Davao, Tayag's Aberdeen Farms in Angeles City, Monterey Corporation in Cavite, and Puyat's Bulacan Dairies.

The significant involvement of the smallholder sector must not be overlooked. Some farmer-cooperators of DTRI, BAI and KKK-PRDP are still engaged in small scale dairy business. The farmer-cooperators of PDC continue to milk their animals and let DTRI process the milk through a few intermediaries. In the provinces of Laguna and Quezon, 12 primary cooperatives with a total membership of some 205 dairy farmers were organized and federated into the Southern Tagalog Dairy Cooperative which now handles their own milk collection, product processing, distribution and marketing.

In addition, numerous dairy-based cottage industries have been successfully operating. For instance we have the famous "Kesong Puti" of Sta. Cruz, Laguna, "Pastillas de Leche" which is Tuguegarao's pride and other milk-based products.

Unfortunately, however, despite these efforts of both government and private sectors, the dairy industry remains underdeveloped. The ultimate irony perhaps is that while local milk production is low, this is not effectively and efficiently marketed.

There are indeed constraints in our efforts to develop the country's dairy industry. It is imperative to identify the real problems and seek or formulate plausible solutions.

Questions are thus raised:

- Is the national strategy, the concept of implementation/operations, and policies of government inappropriate to realize a significant headway?
- Are the efforts exerted by all concerned sectors disconcerted?
- Are the investment opportunities in dairying not conducive to attract private capital?
- Shall we have to wait for another Chernobyl tragedy to push concerned constituents to act vigorously?
- Shall we abandon bold development programs we have already initiated after being allocated critical human, financial and material resources?

These and many other issues have to be tackled and resolved to ensure the industry's growth.

The urgent need to develop an industry, the severity of the problems, the diversity and apparent absence of concerted efforts among the sectors involved dictate the need for a forum where all these shall be addressed to. It is essential that concrete course of immediate, short-term and long-range actions which integrate production, processing, and marketing capabilities of all concerned sectors be formulated and recommended.

**MULTI-SECTORAL CONFERENCE ON DAIRY DEVELOPMENT
STRATEGIES IN THE PHILIPPINES
WORKSHOP MECHANICS AND PROCEDURE**

Dr. Lex Libreto
(General Rapporteur)

This conference is structured in such a way as to hold workshops on a weekly basis. There are three workshops and one symposium. The first workshop shall be held on 17 October 1986 at the Student Union Building, UPLB. The second workshop shall be held on 23 October 1986 at the NSTA Executive Lounge in Bicutan. The third workshop shall be held on 30 October 1986 at PCARRD.

Workshops are structured as follows:

1. The main papers and presentations shall be presented in the morning. The morning session shall be followed by an open forum. We will break up for lunch at 12:00 and resume our sessions and workshops at 1:00.
2. There will be three workshop groups, namely: Workshop I-Production; Workshop II-Technology; and Workshop III-Marketing. Workshop members have been identified, as indicated herein. Workshop group leaders, too, have been identified and a rapporteur has been assigned to each workshop group.
3. This is going to be followed-up by a plenary session where the workshop groups shall report on their respective outputs.

There shall be workshop output reports. These reports shall be formally presented in a symposium to be held on 28 November 1986. That symposium shall cap the series of workshop activities. During that symposium, we hope to present to the Ministry of Agriculture and Food, as well as other high government officials, the output of this Conference. It is our expectation that our output shall serve as the basis for future government and private actions on the dairy industry.

STATUS OF THE PHILIPPINE DAIRY INDUSTRY

Noemi K. Torreta

Division Chief

Philippine Dairy Corporation – Ministry of Agriculture and Food

Good Morning. Our acting President, Mr. Enrico Endaya would have wanted to be with you in this workshop. However, he has some pressing commitments which have to be attended to. That's why he requested my colleagues and me to be with you today. Our President, Mr. Conrado Gozun has just arrived from the United States and likewise, he could not attend. Just the same, allow us to contribute something for the workshop.

There are two (2) parts in this paper: one is the Philippine Dairy Industry, in general, and the other is the Philippine Dairy Corporation's experience.

Brief History of the Dairy Industry in the Philippines

Let me first discuss with you a brief history of the dairy industry in the Philippines.

Way back in the pre-Spanish period, the Filipinos had known and consumed milk which was solely provided by the carabaos. The milk, which is much sweeter and fatter than cow's milk, was treated as an insignificant by-product. The carabao was traditionally reared for its lean meat which was usually reserved for special occasions like religious festivities.

A number of different milk-based products was introduced by the Spaniards. However, consumption of these products never became a regular diet for the Filipinos and most of the limited supply was consumed by the Spaniards.

Then came the American period where the American public school teachers stressed the importance of milk and dairy products in proper nutrition. Cheap, plain cheeses, like American Cheddar, became popular during this period. It was also during this period that the modern Philippine dairy industry was started. Ice cream became the most popular among the products introduced. Milk powder which was sent to the Philippines in massive amounts as food aid was reconstituted or repacked by the newly established processing plants for distribution and sale in the country. Gradually, the desire of the Filipinos to consume milk was developed, but the ever-increasing demand and the stagnant local supply caused the country to constantly increase dairy imports.

The increase in the number of multinational firms engaged in dairy product manufacturing is another notable development. These companies have dominated

the local sector ever since the first was established during the American period. These companies which provide more than 90% of the country's dairy requirements produce products of foreign brands and with imported-based ingredients.

For the past 25 years, the Philippine government had initiated the establishment of pilot dairy farms, dairy project and dairy plants. Even dairy farms operated by the private sector pushed their way towards developing the country's dairy industry. However, despite numerous efforts, dairying in the Philippines could hardly be considered in its way towards success.

The Philippine Dairy Industry Today

The Philippine dairy industry is virtually underdeveloped. Efforts to develop the local base for the dairy industry have been dampened by the influx of powdered milk coming from dairy producing countries where agricultural policies protect domestic producers and where its surplus milk is dumped in the international market. Unfortunately, the Philippines is just one of the dumping grounds for surplus milk. Ninety-nine percent of our total dairy supply comes from countries like New Zealand, Australia, Canada, the United Kingdom, U.S.A, Denmark and the Netherlands.

For the past ten years our average annual imports translate to 95,000 metric tons and worth US\$105 million. At current exchange rates, this is equivalent to ₱2.1 billion per year. Dairying in the Philippines therefore is practically a repacking and reprocessing industry. What more, it causes drains on our dollar reserves which we could not afford at the present.

The strikes at Nestle Philippines (Filipro) and Holland Milk Products late last year and early this year had caused a drying up of milk supply and consequently effected significant price increases in supermarkets and retail stores. The Chernobyl incident further magnified the state we are in. Such disaster resulted in partial dislocations of our dairy supply. Apprehensions on buying repacked/recombined imported-based products prevailed among the public consumers. These events and the events of the last Philippine Revolution and the potential at that time for an outbreak of a civil war would necessitate a local dairy industry.

The stockpiles of butter and powdered milk in the international market are due to subsidies, price support programs and domestic policies in exporting countries. However, these exporting countries are currently trying to reduce surpluses and cut back on subsidies. In the very near future, this will mean a tighter supply situation and higher prices on the Philippine side.

The annual milk consumption in the country had stood at 1 billion liters liquid milk equivalent for the past ten years. However, due to increased population growth, the per capita consumption for milk and milk products had been declining. Currently, it is 16 kg per capita per year as against the recommended rate of 36 kg per capita per year.

With the ever-growing Philippine population and the wider spread of the vulnerable age group, where should the Philippines direct its thrusts? The Philippines has to achieve even partial self-sufficiency in milk to provide for food security and fill the needs of an ever-growing population. It is unfortunate, however, that our domestic milk production accounts for only one percent of our total dairy supply: 88% of which is produced by private and commercially owned dairy farms and the rest by the government-supported smallholder dairy producers. It is sad to note further that even the private and commercially owned dairy farms in the country which comprise a major portion of the domestic milk supply come and go without even making a significant headway in developing the local dairy industry.

Not any one agency, be it private or government can solely do the task of developing the local dairy industry. The private sector could concentrate on areas where it is most familiar: processing and marketing. As private individuals with farms within the production zones, they could perhaps go into dairy farming. And as milk processors, they could buy local milk for use as production input. On the government side, its declared commitment to the objectives of self-sufficiency in milk needs to be reiterated and supported by policy responses to the evolving dairy situation. A need to clarify, reassess, re-define and delineate the roles and responsibilities of each agency concerned is urgent. Coordination and support from among all agencies in dairying is therefore essential.

With everybody doing his share, we can achieve targets and goals and be on the right course.

Dairying: The PDC Experience

The signing into law of the Batas Pambansa Blg. 21, otherwise known as the "Dairy Industry Development Act of 1979" paved the way for the creation of the Philippine Dairy Corporation. The PDC, an attached agency of the Ministry of Agriculture and Food has the following objectives:

1. To promote production of and achieve self-sufficiency in milk;
2. To generate employment and increase the level of income in the rural areas through dairy production; and
3. To conserve foreign exchange.

The PDC formally started its operations on July 03, 1981. There are two milk production zones where PDC operates: The Southern Tagalog, consisting of the provinces of Batangas, Laguna, Cavite and Quezon; and the Northern Mindanao, consisting of the provinces of Bukidnon and Misamis Oriental. For the past five years, PDC had:

1. Distributed 2500 dairy animals in the milk production zones and upgraded 27,000 cows/municipalities in coordination with the MAF regional offices.

2. Produced 860,000 liters of milk through the smallhold and semi-commercial farms.
3. Trained technical personnel and performed delivery of technical services and extension activities.
4. Trained backyard and semi-commercial farmers on the care and management of dairy animals, forage development, milking techniques, quality control and para-veterinary practices.
5. Established support facilities such as milk chilling centers in Batangas and Cavite and a milk processing plant in Alabang, Muntinlupa.
6. Devised milk collection prints and accessible routes to facilitate transport of milk from farmers to chilling centers and/or processing plants.
7. Promoted milk consumption in rural homes and urban centers.

Despite these major accomplishments, PDC was not spared of problems, among which were:

1. Absence of standard policies for implementation in the project areas;
2. Wide coverage of areas resulting to minimum use and allocation of resources;
3. Inability to provide market for milk produced by farmers in the project areas;
4. High maintenance and operating costs of chilling and processing plants; and lastly,
5. Financial constraints which hampered the field operations and caused delay of payments to farmers.

During the second quarter of this year, PDC had to temporarily suspend its operations due to budgetary constraints. Milk continued to flow and calves dropped but still, PDC could not collect the milk, deliver it to the chilling and processing plants and market it. Milk payments to farmers were delayed and the field personnel unwillingly had to practically stop from delivering technical and extension services. Farmers' milk was literally thrown away. This continued in the next quarter. In the process of threshing out the problems, operations were seriously affected. It was a no-go situation from the top. Everybody was at a standstill.

The impact of what happened to PDC operations in the past six months is a growing concern to us. It could, however, be noted that these developments triggered a sense of awareness to the farmer-cooperators of PDC. The once resilient farmers now ardently seek the continuity of the dairy program. Farmers have benefited from this endeavor. They have learned the value of dairying. Aside from the extra income they get, the feeling of owning a calf through the calf-sharing system boosted their morale. They have imbibed the idea of the technology and is now receptive to the dairy industry. Not only was dairying a supplementary source of income but it had turned to be a major source of livelihood for some farmer-cooperators. The problems that have cropped up did not deter them to revive their dwindling hope. Some PDC farmer-cooperators consolidated themselves into

groups. . . some even federated. . . the cause of which is to take positive measures to save the program from collapsing. One good example is the Southern Tagalog Dairy Cooperatives (STDC).

This secondary cooperative is composed of 12 primary cooperatives which now handles the collection and marketing of milk. With PDC's inability to assist the farmers, other concerned agencies like UPLB-DTRI and ACCI came to STDC's rescue. Today, the STDC is composed of 250 farmers from the provinces of Laguna and Quezon.

However, STDC is just a portion of the PDC farmer-cooperators. PDC still has around 900 more farmer-cooperators scattered in the two milk production areas.

While the suspension of PDC operations posed serious problems, this could however be taken into a more favorable light. The natural course of events that took place proved helpful in awakening and entrepreneurial concerns of the farmers and the cooperatives. Because of this, PDC had re-assessed its directions, its thrust now being to handle the developmental concerns: introduction and initiation of the project; technology transfer and the creation of business awareness among farmers to prepare them to become self-reliant and not forever dependent on government support. These, however, are not the only roles of PDC. Again, it is hoped that through this workshop, the roles and responsibilities of PDC could be defined in relation to the other roles and responsibilities of each and every agency involved in dairying.

DAIRYING AS A BUSINESS ENTERPRISE: EXPERIENCES AND OPPORTUNITIES

Ricardo G. Acabado
Magnolia Dairy Farm

Introduction

The approach used in this presentation is based on the premise that the audience has basic knowledge and some degree of understanding in regard to dairy cattle production.

I am pretty sure that most, if not all of you, had already heard of the Magnolia Dairy Farm, its location, breed of cattle being raised there, the designs of barns and milking parlor, milking systems, forages grown and some other things. This being the case, I purposely omitted this portion and will go directly to the success factors influencing dairy farming.

I had always been told, and from time to time read in some technical papers, that the only successful commercial dairy farm in the country is the Magnolia Dairy Farm. With due respect to other dairy farms, I would say this is true. However, let me inform you at this point that there is an upcoming commercial dairy farm that has also the ingredients of success. This is the Monterey Dairy Farm in Gen. Trias, Cavite.

So, what makes a dairy farm successful? According to Dr. Etgen and Prof. Reaves in their book entitled *Dairy Cattle Feeding and Management*, "dairying is a business as well as a way of life". This is the same doctrine that the staff and management of Magnolia Dairy Farm subscribe to. And this, I believe is a major factor that makes the biggest purebreed Holstein Friesian dairy farm in Southeast Asia successful. Another factor is, being a part of San Miguel Corporation, we conduct our business with honor.

Aside from these guiding philosophies, the other factors which are more technical in nature are:

- i. Business Management Skills and Competence
- ii. Technical Expertise
- iii. Marketing and Logistic Support
- iv. Adequate Herd Size
- v. Highly Motivated and Innovative Manpower Complement
- vi. Quality Output

Let me elucidate on these.

Business Management Skills and Competence

In any business enterprise, the very basic thing to do in order to have a high degree of success is to:

1. Identify the strategic direction the business should pursue.
2. Establish and implement production and investment costs monitoring systems.
3. Gather accurate and complete financial and technical records.
4. Monitor productivity measures such as feed conversion, capacity utilization, machine efficiency and others.

Technical Expertise

Dairy farming, being a dynamic field, requires a lot of technical expertise from the management group. As such, there is a great need to establish strategic programs related to:

1. Genetics and Breeding — programs should include ways of improving herd genetic composition and breeding efficiency.
2. Feeding and Nutrition — quality control measures should be imposed on the feedstuff to use after identifying the nutrients required by the cattle.
3. Animal Health — prevention of the occurrence of a disease is still the cheapest way of ensuring the health of the animals.
4. Hygiene, Sanitation and Safety — there should be standards for both animals and personnel. Strict compliance to the measures and procedures is compulsory to both employees and guests.
5. Land, Buildings, Machineries and Equipment Management — normally this portion accounts for about 45% to 55% of the total funds invested. Proper management is but necessary.

Marketing and Logistic Support

Support in this context does not mean subsidy. Historically, almost all of the dairy farms set up since WW II to present had folded up primarily due to marketing difficulties. The strength of the dairy farm depends largely on its ability to market its produce and the availability of logistic supports such as laboratory facilities for disease diagnosis and feeds evaluation, training modules for employees and independent audit group. Therefore, it is imperative to have:

1. An assurance of continuing tie-up with a very strong marketing unit;
2. Reliable milk hauling and distribution units;
3. Reasonable milk payment scheme.

There should be a policy to ban importation of liquid milk and other flavored milk drinks.

Adequate Herd Size

In the U.S. today, the minimum number of milking cows that appeared to be workable is in the vicinity of more than 30 heads. A rule of thumb could be any number that should make a farmer work full time and make dairying his way of life. The herd should have the ideal composition of 45% cows-in-milk, 10% dry pregnant cows, 24% heifers above 10 months of age, 13% young calves of 1 1/2 to 10 months old, and 8% nursing calves below 1 1/2 months old.

Highly Motivated and Innovative Manpower Complement

The most powerful resource a dairy farm could have is the people who actually do the work in accordance with established rules, procedures and practices. Thus, it is necessary to provide:

1. proper working environment
2. programs for personnel development
3. system to involve the workers in decision making
4. year-round sports and physical fitness programs.

Quality Output

This is the culmination of all the efforts of everyone involved in the business. The output of a dairy farm would be the milk, veal calves or male fatteners and other miscellaneous items including technology in varying degrees. Allow me to deal some more on the first one – milk which is normally about 80-85% of the total output of a dairy farm.

To produce quality milk, we should have the following basic ingredients:

1. Hygienic and proper working environment
2. Disease-free herd and personnel
3. Effective cleaning and disinfection systems and procedures
4. Efficient milk cooling system

I am confident that you will agree with me without reservation if I say that the major reason why Magnolia products sell anywhere is because of its quality products, quality people and quality service.

In conclusion, let me state the fundamental thrust that Magnolia has envisioned in support of the dairy industry. The Farm is intended to be a pilot and control project where technical experiments can be conducted. We do not intend to produce all the fresh milk that the market can absorb. The major thrust is to

encourage other entities to go into dairy farming with government support and for Magnolia to guarantee the market for their produce. In this way, we think, we shall be able to expand fresh milk production at a faster rate. It is our feeling that the bulk of fresh milk production should come from others. And since Magnolia is today the biggest and the most extensively developed marketing group for milk then our function is to continually develop the local market to ensure that we can absorb all production of all farms.

DAIRYING AS A BUSINESS ENTERPRISE: EXPERIENCE AND PROBLEMS

Arturo M. Tolentino
Cattle Technical Operation Manager
Monterey Farms Corporation

Introduction

In 1978 as a part of MFC's cattle upgrading program, holstein semen was introduced into the herd. Brahman-Zebu cross cows artificially inseminated while the heifers were naturally bred. This program still continue except the bulls are only used for clean up.

Milking operation in confinement was started on experimental basis in 1982 among 50 percent holstein blood cattle to gather information on:

- a) Milk production potential
- b) Lactation period
- c) Calving interval
- d) Growth rate
- e) Feeding
- f) And other related problems

Currently we are milking seven hundred head of two different holstein cross blood groups: fifty and seventy five percent.

Experiences and Problems

In any business venture income should be realized soonest possible to be able to assess its continuing prospects.

In the case of dairying, I have enumerated six major related areas that would determine success or failure. Always our goal is to produce more milk over a long period but not over ten months to realize extra income for the calf that is to be born after every twelve to thirteen months. Similarly, the growth rate from growing bulls should at least be at a level to pay for their daily maintenance and cost of money. Replacement heifers should be growing at a rate that would enable us to inseminate them at around twenty five to twenty seven months with size and weight we wanted them to be.

Hereunder are some areas I would like to address this workshop.

Feeds and Feeding

It is always aimed at growing, maintaining, reproducing the animals at least to their optimum and producing maximum milk yield at the cheapest feed cost possible.

How are we going to attain them?

1. With cross bred holsteins predominantly in the country for milking, how should we feed them?
2. With only grass to feed, how much are we going to achieve? What kind and quality of grass do we have to feed?
3. With grass and concentrate combination to feed, how much of each do we have to give?
4. What feed cost can we afford to maximize production and remain in business?

These are questions that most of us doesn't know to answer. What's happening now are purely trial and error. Say when you feed this stuff singly or in combination with others you achieve this or when you don't have enough of this your production goes like this. So its really difficult most especially for the small to medium size dairy farmers who don't have the technical background on nutrition.

Housing

Under our humid tropical condition, how should we house our animals? How much space is allowable under total concrete, dirt, combination of concrete and dirt lot for each different classes? What about roofing provision; how big an area should be under roof? What type of roof?

What about barn or pen sanitation of the area under roof. When you go into hosing down of pens especially if your herd size is big, how do you do this? It would require a big volume of water, render the barn wet making the condition favorable for harmful organisms to multiply fast. If we provide beddings, what bedding are we going to use? How do you source for your requirement 365 days a year? How would you prevent outside infection from the bedding to come into your herd? What and how much compromise can we afford to stay on business?

Manure Disposal

Manure disposal becomes a problem if you don't have enough land. What would happen if your daily manure output is more than what you need?

I have seen in one country a system whereby cattle manure is processed into fertilizer sold by the tons and the income earned is a significant supplement to the dairy business.

What about other ways of processing to make use of it aside as fertilizer?

These are some of the major concerns earned in the last four years we've been milking.

DAIRYING AS A BUSINESS ENTERPRISE: EXPERIENCES AND OPPORTUNITIES

Antonio Zuniga
Aberdeen Farm

My topic for this workshop is "Dairying as a Business Enterprise Experience and Problem", but what I shall tackle is quite different from what the preceding speaker, Mr. Acabado of Magnolia Farms has mentioned. I am going to impart to the participants our experiences when we established the Aberdeen Dairy Farm. For your information, this small dairy farm is located in Angeles City, Pampanga. It was founded by Atty. Manuel S. Tayag who is also the president of the company.

Aberdeen Dairy Farm initially started with a ₱6 million capital. Some ₱1.5 million was raised by the stockholders and the rest was borrowed from the Development Bank of the Philippines. It is registered with the BOI, as a pioneering company. In 1980, we started the construction of buildings, layouting of the pastures, fencing, and other activities. We followed everything based on the plan or the feasibility study we had, and we encountered some problems foremost with the importation of animals. Our initial plan was to import Holstein X Sahiwal. Way back in 1981, we were supposed to import some 120 heads of this breed from New Zealand. Thinking about the Holstein Freisian X Sahiwal not being commercially grown in the Philippines, it was a big task for us to prove that this really fitted our location. Angeles City is a dry area and we thought that a more tropical dairy breed fitted our condition. Also in 1981, the DBP was supposed to open a Letter of Credit for the company so it could import the 120 heads from New Zealand. I was sent there in February of the same year to select the animals and have a look at their grazing habits and particularly at how they were to be managed later on. However, a certain presidential decree was issued requiring animals coming from New Zealand or Australia to be quarantined in Busuanga. We were apprehensive whether they will be kept real well in that area. This prompted us to write deposed President Marcos to seek for an exemption from this PD. He signed the letter and endorsed it to former Minister of Agriculture and Food, S. Escudero III who at the time was the Director of BAI. He merely stated how many heifers, pregnant cows, and total number of animals we should get. There seemed to be a certain political tone in this problem that the Director thought he was bypassed. Other efforts were made but to no avail. The Ambassador of New Zealand even talked to the Minister but still, we failed to get the animals. In May 1981, Mr. Manuel Tayag and his brother Renato S. Tayag, Jr. went to Israel to again sort animals because they were carefully looking for a breed adaptable to the climate of

Angeles City. Seeing that Israel was more of a country quite comparable to ours, I was again asked to go there to pick the animals. But before I was able to go, we received this letter from then Director S. Escudero III saying that importation of animals from Israel was banned because of a strain of hoof and mouth disease. So again, we were delayed.

Finally, it was almost one and a half years after when they permitted us to import the animals which we did from the United States' Midwest area. The problem was that, we were in a hurry since time is not on our side and we had already accumulated so many feeds at the farm. We had established the pasture of Napier and guinea grass and also had ensiled 140 tons of canetops and 70 tons of corn silage.

Incidentally, it was noteworthy that our people at the farm were trained by DTRI, two of whom were taught in dairy technology and eight were taught about the practical skills in animal handling. This was a one-month training, February-March of 1981, prior to the projected date of arrival of the animals from New Zealand which was April 1981.

By March 1982, the animals arrived in the Philippines. Unluckily during that time, the United States has the severest winter and the animals arrived here in summer. So what happened was that, of the 91 heads, 14 died within 30 days after arrival. Our hope was recovered when the suppliers replaced the 14 animals after two months, as stipulated in the insurance which covered the imported animals. During the time of quarantine, we were able to get two veterinarians, Drs. Martin and Rayos, who helped us in this predicament.

After the problem on importation came other problems such as incidences of epidemic and adjustment which were solved six months after when the animals were able to adjust to the conditions in the farm. After this, we were confronted by the problem about marketing of milk. At first when our production was only about 400 liters, we marketed it in Angeles City, San Fernando, and Olongapo. There came a time when it went up to 700 to 900 liters a day and we found it hard to dispose such a large volume. So then we diversified it into other dairy products with the help of Dr. Dulay. We had to tap expertise from outside because we lacked technological knowhow to be able to cope with the business. Subsequently, we were able to establish new product in our market in Angeles City, San Fernando, Olongapo City and Metro Manila. There was even a time when we were supplying KKK-PRDP with raw milk.

Now let us talk about consumption. In our observation, we found out that the market for fresh milk is the A & B class, thus selling is not a simple thing to say or do. We started selling milk in 1982 at ₱5.50/liter which we thought is affordable to all, but there is more to consider when marketing milk. Then in the latter part of 1982, there was this anchor project concept brought up by KKK-HSDC. Aberdeen Farm will serve as anchor farm wherein dairy animals were to be dispersed to prospective dairy farmer-cooperators within the vicinity or neighboring towns. Under the agreement, the HSDC will finance the dispersal project and Aberdeen

Farm will give the technical support in addition to purchasing, marketing, and processing of milk. Payments pertaining to the loans of the farmers will be based on the milk collection and sale of male offspring was also a part of the agreement. There were two phases of the project. The first phase was pushed through in middle part of 1983. HSDC bought the preferred shares of the company so they infused some working capital. The second phase was to expand the dairy plant and to disperse animals in Angeles City, Porac and Magalang area, with farmers already identified. The second phase never pushed through for reasons I vaguely know but that was the time when a lot of political instability was an issue as well as economic survival. Maybe it was a well conceived plan but nobody ever picked it up and say look, Pampanga can be another dairy zone. We have a dairy plant here and maybe have a look at it and give us another chance specifically this time when rural development is needed.

I think the years 1982-85 were not really favorable for the businessmen in particular. There were times when we felt that a lot of people seemed economically and politically unstable. Prior to this, the interest rate for loan was only 14% and suddenly rose to 27 to 29% and sometimes, 30% and higher.

So, those were some of the problems and actually we are not trying to compete with Magnolia nor trying to compare ourselves with it. What we are trying to say is that, dairying as a business is really a venture. When it comes to the question of will and possibility, we have shown that dairying is possible. If you merely look at dairying, define it in simple context, having it pertain to farmer producing milk, then that is not really what dairying is all about. The other aspects we can consider are, for example, some farmers can grow forage crop to supply other dairy farmers as what we have done considering our limited area for forage; some can probably go into breeding and produce replacement heifers, other activities related to the dairy industry. In Australia and New Zealand where the dairy industry is specialized and well organized such that whenever a farm needs feed supply, they can call up suppliers to bring them, say, 10 tons of hay. They are organized in the form of a cooperative and with a good marketing board for their dairy products for local and export demands.

As of now, I cannot really define the direction of our dairy industry except that we have commercial farms, small holders, and now, the Southern Tagalog Dairy Cooperatives. What we can actually say is that dairying is possible and can exist. The option for the development of dairy industry lies in the government and the private sector for help or support. I believe that with this multisectoral meeting at least, we are again trying to see which direction we are going and probably we could come up with what I may say a "survival kit" for the local dairy industry.

DAIRYING AS A BUSINESS ENTERPRISE: EXPERIENCE AND PROBLEMS

C. V. Nievera
Magnolia Division
San Miguel Corporation

Dairying, as a business enterprise, could be classified into two primary areas, namely: a) dairy farming or milk production and b) dairy processing. Dairy farming, being more basic has more deep-rooted problems involving, among other things, government planning, policies, and assistance. Dairy processing, on the other hand, has comparatively gained more ground as a business undertaking.

The dairy manufacturing industry in the Philippines is still almost wholly a recombined-milk type of business since its principal raw materials have to be "recombined or reconstituted" with water to produce the desired dairy product. Except for vegetable oil and in certain cases, sugar, the bulk of these materials (e.g., milk powders, milkfat) are imported. San Miguel Corporation is so far still the only successful dairy farm since the early 60's, producing milk as Magnolia fresh milk in bottles or tetra brik, besides being used also in some of Magnolia's other dairy products. Except therefore for SMC, the rest of manufacturers or repackers producing canned evaporated milk, sweetened condensed milk, canned milk powders are entirely dependent on imported raw materials.

In view therefore of the country's dependence on the use of imported dry dairy materials, the technology of milk recombination has to be developed as a matter of necessity. Expertise in this area today is relatively highly developed, sometimes surpassing those in other advanced countries for products such as recombined milk and butter, recombined whipping cream, etc. This is understandable because other countries, particularly those with highly developed dairy farming find no need to recombine or reconstitute milk and milk products from milk powders and milkfat. However, there appears to be no reason for us to be jubilant over our being experts in dairy processing because in the long-term, it could be to our own disadvantage.

The milk industry is very much dependent on imports. At present, the cost of locally produced milk is about 50% more than the equivalent milk reconstituted from imported milk powders. This cost advantage is only true as long as the cost of the imported material is kept low through the exporting countries' dairy subsidies and as long as our government maintains low ad valorem rates on imported dairy materials. Countries, particularly New Zealand, Australia, Holland, Germany (to name a few) wherein dairy products are one of their major exports, have

developed sophisticated marketing network and technical services to ensure continued patronage of these products. Despite these major accomplishments, PDC was not spared of problems, among which were:

1. Absence of standard policies for implementation in the project areas;
2. Wide coverage of areas resulting to minimum use and allocation of resources;
3. Inability to provide market for milk produced by farmers in the project areas;
4. High maintenance and operating costs of chilling and processing plants; and lastly,
5. Financial constraints which hampered the field operations and caused the delay of milk payments to farmers.

During the second quarter of this year, PDC had to temporarily suspend its operations due to budgetary constraints. Milk continued to flow and calves dropped but still, PDC could not collect the milk, deliver it to the chilling and processing plants and market it. Milk payments to farmers were delayed and the field personnel unwillingly had to practically stop from delivering technical and extension services. Farmers' milk was literally thrown away. This continued in the next quarter. In the process of threshing out the problems, operations were seriously affected. It was a no-go situation from the top. Everybody was at a standstill. The impact of what happened to PDC operations in the past six months is a growing concern to us. It could, however, be noted that these developments triggered a sense of awareness to the farmer-cooperators of PDC. The once resilient farmers now ardently seek the continuity of the dairy program. Farmers have benefited from this endeavor. They have learned the value of dairying. Aside from the extra income they get, the feeling of owning a calf through the calf-sharing system boosted their morale. They have imbibed the idea of the technology and is now receptive to the dairy industry. Not only was dairying a supplementary source of income but it had turned to be a major source of livelihood for some farmer-cooperators. The problems that have cropped up did not deter them to revive their dwindling hope. Some PDC farmer-cooperators consolidated themselves into groups. . . some even federated. . . the cause of which is to take positive measures to save the program from collapsing. One good example is the Southern Tagalog Dairy Cooperatives (STDC).

This secondary cooperative is composed of 12 primary cooperatives which now handles the collection and marketing of milk. With PDC's inability to assist the farmers, other concerned agencies like UPLB-DTRI and ACCI came to STDC's rescue. Today, the STDC is composed of 250 farmers from the provinces of Laguna and Quezon.

However, STDC is just a portion of the PDC farmer-cooperators. PDC still has around 900 more farmer-cooperators scattered in the two milk production areas.

While the suspension of PDC operations posed serious problems, this could however be taken into a more favorable light. The natural course of events that took place proved helpful in awakening the entrepreneurial concerns of the farmers and the cooperatives. Because of this, PDC had re-assessed its directions; being its thrust now is to handle the developmental concerns: introduction and initiation of the project; technology transfer and the creation of business awareness among farmers to prepare them to become self-reliant and not forever depend on government support. These, however, are not the only roles of PDC. Again, it is hoped that through this workshop, the roles and responsibilities of PDC could be defined in relation to the other roles and responsibilities of each and every agency involved in dairying.

SMALLHOLD DAIRY FARMING The PDC Experience

Adolfo Gabatin

Southern Tagalog Dairy Cooperative

Magandang hapon po sa inyong lahat. Ako po'y humihingi ng paumanhin sa nangyari kanina sapagkat hindi ko po nalalaman na may pagbabago pala yung programa na aking natanggap. Kung kaya ang akin pong inaasahan ay mamayang alas tres pa ako haaharap sa inyo para sabihin ang mga karanasan namin sapul po nang kami ay magkaroon ng mga bakang gatasan. Ganunpaman, kahit po huli ay pinilit ko rin pong ako'y makarating ngayon upang maghain nang tulad ng inyong inaasahan. Bago po ako magpasimula, ako po'y magpapakilala na ako'y isang taal na magsasaka na sa pulungang ito inaasahan ko po na inyo sana akong uunawain sapagkat tulad ng sabi ko ako'y magsasaka hindi ako sanay magsalita ng mga wikang banyaga kaya ang paumanhin at pang-unawa ninyo ay aking inaasahan.

Ang totoo po, sa ngayon, kami po ay nasa maselang kalagayan at hanggang ngayon din po mayroong problema pa rin po kaming masasalimuha. Ngayon, ang masasabi ko dahil sa nakatalaga po sa akin ay isiwalat o sabihin ko ang mga naging karanasan namin sa pag-iimplementa o pagsasakatuparan noong mga bakang gatasan dito sa ating bansa ay ito po ay nagsimula noong dumating sa aming lugar ang Philippine Dairy Corporation, nag-alok ng mga bakang gatasan na ang layunin po ay para makatulong sa aming mga mahihirap, sampu ng ating pamayanan sapagkat nasabi nila na ang ating kinukunsumong gatas dito sa ating bansa halos nobenta. Mahigit 90% po ay ating inaangkat kung kaya't sila po ay lumapit sa amin para tulungan daw ang ating bayan. Naglakas-loob kami sapagkat ang kanilang hain sa amin ay pawang magaganda na inakala namin ay makatutulong sa aming pangkabuhayan doon sa kabukiran. Ang totoo nga po, noong mga unang panahon ng pagsasakatuparan ng paggagatas, kami po ay walang kamuwangan. Sapagkat dala ng programa nila na kami'y pagkalooban ng kanilang baka — may kasama po yang tekniko, beteryaryo at suplemento sa pangangailangan ng hayop. Kung kaya po nang magsimulang bigyan kami ng pagkakataong maggatas ay kasabay din po ng programang yan na sila rin po ang kumukuha sa amin at sila rin po ang nagbabayad. Kung kaya't kami ay naliligayahan, nagkaroon ng karagdagan kita para sa aming mga pamilya. Noon po, nang mga panahong 'yon, siguro humigit-kumulang mga isang taon, sapul nang matanggap ang baka, lahat po ng pangangailangan sa aming pamilya ay aming nasustentuhan sampu ng hayop na ipinagkaloob sa aming ng PDC ay amin pong natustusan sa pangangailangan din po ng hayop na 'yan. Ngunit, dala po siguro ng sitwasyon, na nitong mga nakaraang panahon, nakaraan siguro na mga

buwan ng Enero, naramdaman po namin na meron tayong isasakatuparang, eleksiyon. At 'yon pong eleksiyon na 'yan, dala kasi ng politiko — 'yun po ang naging pangitain namin o saloobin. Kung kaya't 'yung magandang naging karanasan namin sapul ng kami maggatas ay bigla pong lumabo at nagkaroon ng lambong makatapos itong eleksiyon. 'Yun pong mga biyaya na aming natatanggap na ang gatas na nakukuha namin sa kanilang baka ay nagiging pera at nakatutulong sa amin at sampu ng kanilang hayop na nasa aming pangangalaga'y amin ding natutulungan. Ngunit nang magpalit po ng administrasyon, bigla pong tumigil ng pangongoleksiyon ng gatas at tinigilan na rin po 'yung pagbabayad sa amin, hanggang sa kasalukuyan, 'yun pong aming inaasahang bayad sa gatas na kinolekta sa amin ng PDC hanggang ngayon po ay hindi pa namin natatanggap. Kung kaya po't naging sawikain naming magsasaka dito sa parte ng Laguna, "bakit nagkaganoon? Dati-rati 'yang bakang 'yan tayo ang tinutulungan. Ngunit ngayon ay nabaligtad yata. Sapul nang mawala ang kanilang tauhan at suporta, ay tayo ngayon ang nagsasakripisyo sa bakang yan. . . tayo ang bumubuhay." Dala kasi ng aming pagmamalasakit at pagmamahal sa isang hayop na pinakikinabangan, kahit po utang ay amin pong ipinangungutang ang hayop na 'yan, sapagkat umaasa pa rin po kami na ang PDC, kahit na kami iniwanan sa gitna ng kalungkutan, may panahon pa rin po siguro na sila'y babalik sa amin, mauunawaan ang aming isinasagawa ngayon, at ang aming katatayuan ay kanilang maunawaan. Kung kaya po't sapul nang kami'y iwanan ng PDC, sa magagandang naganap sa amin ay biglang lumungkot at lumabo, kami po na mga magsasaka ay nagkaisa, nagsama-sama at sa ngayon po ay humantong po kami sa isang lupon o grupo na hindi namin inaasahan sa aming buhay na kami ang makapagtatag ng grupong ito, dahil sa ang inaasahan namin noon ang PDC ang siyang mangunguna sa amin para buuin ang tinatawag naming kooperatiba ngayon. Ngunit dala po ng aming problema — matinding problema sa larangan ng paggagatas ay nagkaisa po kami kahit na kami ay mga magsasaka na walang kamuwangan sa pagpapatakbo ng negosyo, naglakas-loob po kami na lumapit — inihanap po namin ng solusyon ang aming iisang problema — iisang problema ng mga magsasakang nakatanggap ng baka sa PDC. At sa kasalukuyan po, sa amin pong hindi pagpigil sa pagsasaliksik — paghahanap ng lunas, nakarating po kami sa tanggapan ng isa pong institusyon dito sa Unibersidad, 'yon po and DTRI. . humingi po kami ng tulong doon, inihatid po kami, tinulungan din po kami kung paano mabubuo kami — tinulungan kami na ikunsulta sa institusyon ng ACCI. At dahil sa matinding pagnanais ng mga institusyon na 'yon sa kami'y tulongan, sa ngayon po, kami ay nabuo at 'yan ang tinatawag naming Southern Tagalog Dairy Cooperative. Sapul po nang kami ay mabuo at magkaroon ng pagkakataon na kumilos bilang isang kooperatiba, lumabas po na. . . ewan ko lang po kung talagang ganito nga ang isang kooperatiba. . . wala po yatang katapusan ang problema. Noon po, ang inaasahan namin pag kami ay nabuo, ay tapos na ang problema. Hindi po pala. Sapagkat sa kooperatiba po pala pagka kayo'y nabuo kinakailangan merong negosyo. Nandiyan po ang lumabas, problema namin sa mga teknikal, nandiyan po ang problema sa pinansiyal, nandiyan po ang problema sa aming mga farmers — na hindi namin malaman kung paano namin

maisasagawa nang bigla-biglaan. Kung kaya po't sa ngayon ang kasalukuyan naming karanasan na nagaganap at maaari pa po sigurong magaganap para sa amin ay itong problema na kinakailangan namin ang pagtuklas – pag-aaral, sapagkat kami po tahasan naming sasabihin sa inyo, kami po sa grupo namin ngayon na nakaengkuwentro ng masasakit na problema ay parang nakasugal na ang buhay namin na handa kaming tumalima, lumaban para makatayo kami nang hindi habang panahon 'yung ginawa sa amin ng PDC noong araw nang kami ay binigyan ng magandang pagkakataon tapos nang kami'y napapasarap na bigla kaming iniwanan na hindi namin malaman kung ano ang aming gagawin. Kung kaya po't ya'y naging isang hamon sa aming maliliit na magsasaka. Kaya tahasan kong sasabihin sa inyo, ang STDC po at ang mga miyembro nito ay mga nauntog at nasaktan. Kung kaya't ito pong silang lahat sa aking pangunguna handa pong lumaban sa katagumpayan po ng industriya ng paggagatas dito sa ating bayan. 'Yan po ang masasabi ko na magandang karanasan na medyo lumabo at ngayon po ay medyo gumaganda. Hanggang diyan na lang po at sana po sa inyo na mayroong mga pagkakataon, may bukal na puso na handang tumulong sa aming mga nangangapang magsasaka sa pagpapatakbo ng kooperatiba, kayo po ay aming inaasahang tumulong sa amin, alang-alang sa sitwasyon ng ating bayan, sa krisis na pagkakataon ngayon, tayo po, sa pamamagitan po namin, kami po ay handa nang tumulong sa ikatatagumpay ng industriya, makatulong tayo sa ating mga mamamayan, na ang produktong aming inilunsad sa inyo sa tulong ng mga institutes na tumulong sa amin, 'yan po, siniguro ko malaking tulong sa ating mga mamamayan at sa atin pong bayan. Marami pong salamat, hanggang dito na po lamang.

THE GUARANTEED FUND FOR SMALL & MEDIUM ENTERPRISES

Jesus Tirona
Managing Director

Lending Guidelines

The Guarantee Fund for Small and Medium Enterprises (GFSME) shall guarantee loans under the following guidelines:

1. *Loan Purposes*

The loan availed under the GFSME Program shall be utilized only for the following purposes:

- a. Acquisition of fixed assets;
- b. Construction of plant facilities;
- c. Working capital; and
- d. Payment of existing obligations: Provided, That such is deemed crucial in rationalizing contemplated expansion.

2. *Minimum Borrower Eligibility Criteria*

For eligibility under the GFSME program, the project must satisfy the following minimum criteria:

- a. The proponent must be a Filipino stock corporation where at least 60% of its subscribed capital stock is owned by citizens of the Philippines;
- b. The project must be small or medium scale, i.e., the total project assets must not be less than ₱250,000.00 nor more than ₱10 Million;
- c. In the case of a large-scale corporation that may wish to invest in a small or medium scale project, said corporation has to incorporate anew a subsidiary corporation solely for the project;
- d. The project must have a capital-to-labor ratio of at most ₱40,000.00 to 1, where capital represents total project assets;
- e. The project must have a projected internal rate of return on investment of at least 20% p.a.
- f. The project cash flow statements should show positive cash balances after payment of obligations due;
- g. The project must have a firm, determined and reliable market;
- h. The proponent must have proven managerial capability.

3. *Investment Area*

Projects which are or will be engaged in the direct production and/or processing of food intended for biological consumption, as well as those projects which are indirectly involved in food production, up to one level of backward or forward integration or linkage (from said food production) shall be eligible for financial assistance under the GFSME Program.

4. *Amount of Loan*

The amount of loan shall be as follows:

- a. For small scale loan – ₱200,000.00 to ₱2,000,000.00;
- b. For medium scale loan – more than ₱2,000,000.00 to ₱8,000,000.00

Provided, That in case of borrowers with interlocking directorships or stockholders, the combined loan amount thereof shall not exceed ₱8,000,000.00.

5. *Maturity of Loan*

Loan maturity shall be as follows:

- a. For working capital loan – maximum of five (5) years inclusive of first year grace period on principal payment;
- b. For acquisition of fixed assets – maximum of ~~ten~~ (10) years inclusive of first two (2) years grace period on principal payment.

The grace period shall be reckoned from the date of initial release of the loan.

6. *Rate of Interest*

The Management Board shall determine at the start of every calendar quarter the applicable interest rate for said quarter. A loan approved by the accredited financial institutions during said quarter shall bear the applicable interest rate, compounded monthly.

The interest rate of loan approval shall continue to be the loan's interest rate until the maturity of the loan.

7. *Fees*

The borrower shall pay the following fees:

- a. Origination Fee – One time fee of not more than three per cent (3%) of the principal loan amount payable upon loan approval deductible from the proceeds of the loan.
- b. Guarantee Fee – Two per cent (2%) per annum of eighty five per cent (85%) outstanding loan value of the start of the year, payable annually in advance.
- c. Documentary stamps, notarial fees, mortgage registration fees, and transfer, capital gains and other taxes, if any.

- d. Other charges of the originating financial institution, but not to exceed five per cent (5%) per annum of fifteen per cent (15%) of the outstanding loan value excluding interest, penalties and other charges, payable annually in advance.

8. *Loan to Equity Ratio*

The loan shall require a borrower's equity of not less than twenty per cent (20%) of the appraised value of the project in the form of cash or its fixed assets.

9. *Collateral*

The collateral shall consist of project assets, whether liquid or fixed, existing or to be acquired from the proceeds of the loan. In addition, the loan shall be secured by the joint and several signatures of the principal stockholders of the borrower.

10. *Loan Releases*

Releases shall be made in accordance with the following guidelines:

- a. For working capital loans, support documents must be submitted to the originating financial institution by the borrower before release (for example, List of Payroll for Salaries and Wages, Invoice for Raw Materials Requirement, etc.).
- b. For fixed asset loans, release shall be made directly to the supplier from which the fixed asset shall be purchased based on an invoice or purchase order.

Loan releases shall be in accordance with the project cash flow statement.

11. *Payment of Loan*

The loan shall be paid in equal monthly/quarterly amortization which include payment of interest during the grace period, and principal and interest after the grace period.

12. *Equity Participation Scheme*

The borrower shall make available to the GFSME a stock option with the following features:

- a. The option shall equal at most thirty per cent (30%) of the total of the subscribed capital stock and the stock option, i.e.: $\text{Stock option} = 30\% (\text{Subscribed Capital Stock} + \text{Stock Option})$ The option shall be exercised against the unsubscribed capital stock of the corporation: Provided, That in case the capital stock is not enough to accommodate the stock option of the GFSME, an amendment to increase the capital stock of the corporation must be made.

- b. The option shall be exercisable for at most three (3) years from the date of initial release of the loan;
- c. The borrower may negate the exercise of the option by the GFSME by paying the outstanding loan amount in full plus the corresponding interest subsidy paid for by the GFSME to the originating financial institution;
- d. The GFSME may sell the option to the borrower or to the public.

13. *Guarantee Ceiling*

A maximum of eighty five per cent (85%) of the loan outstanding which includes principal, interest and penalties shall be guaranteed by the GFSME against the risk of default.

14. *Insurance*

The borrower shall insure the project assets offered as collateral against loss and destruction or damage caused by fire, or other calamities during the term of the loan to the extent of the loan value. The assets used as collateral must be insured either with the Philippine Crop Insurance Corporation (PCIC) or the fire insurance pool organized by the GFSME for this purpose. The borrower shall be responsible for the payment of the insurance premium.

The Chief Executive/Operating Officer or the principal stockholder of the borrower shall also be covered by a credit life insurance for an amount not less than the outstanding value of the loan. All insurance policies shall designate the originating financial institution as the beneficiary provided that the policies shall be assigned to the GFSME upon the sale of mortgage or in case of default.

15. *Event of Default*

There is default in case the borrower fails to pay three (3) consecutive monthly amortizations or one (1) quarterly amortization including all applicable fees. In the event of default, the unpaid balance of the loan shall immediately become due and demandable. Failure to pay such unpaid balance shall cause the foreclosure of the mortgages.

16. *Penalty Fee*

Upon the occurrence of the event of default, or failure to pay when due any of his obligations, the borrower shall pay a penalty of one per cent (1%) of any unpaid amount (amortization fees and surcharges due) per month of delay or a fraction thereof, computed from the day payment became due.

17. *Loan Requirements*

The borrower shall submit to the originating financial institution the following minimum requirements:

- a. Project Application Form;
- b. Charter/Articles of incorporation;
- c. By-Laws;
- d. Board Resolutions on the loan request and the authorized signatories;
- e. Financial Statements – Balance Sheet, Income Statement, Cash Flow Statements;
- f. Bio-Data of Officers;
- g. Titles, tax declarations, lot plan, current tax receipts covering the collateral offered as security for the loan;
- h. Project plan which shall include the following:
 - 1. proposed investment outlay,
 - 2. project data
 - 3. feasibility study.

18. *Negative Covenants*

During the term of the loan, the borrower shall not, without the consent of the GFSME, directly, or indirectly:

- a. Declare cash or stock dividends;
- b. Incur new or additional loans from other financial institutions including unavailed portions of credit lines;
- c. Invest any of its funds in new ventures or projects nor open new accounts with other financial institutions;
- d. Dispose any of its assets, except those used in the ordinary course of business.

19. *Warranties*

The sales/rediscounting of a mortgage shall carry, as inherent in the transaction and/or deemed agreed upon without need of express stipulation, the following warranties of the originating financial institution in favor of the GFSME:

- a. Collateral – That in the execution of the mortgages, the originating financial institution exercised proper diligence and technical knowhow in the verification of the ownership/title of the borrower over the project assets used as collateral; that the same were found to be valid and sufficient to pass ownership of the collateral to the buyer(s); and that the ownership papers contained no vitiating defects which could not have been found or discovered with the exercise of proper diligence and technical skill.
- b. Valid Mortgage – That the mortgage constituted in the collateral has satisfied all the legal requirements of a valid mortgage.
- c. Use of Loan – That the originating financial institution exercised care and prudence in the release of the loan to ensure that such was used in accordance with the borrower's stated purpose.

- d. **Appraisal of the Collateral** – That the appraisal and valuation made on the collateral in support of the loan value pertained to the actual condition of the collateral at the time of approval of the loan.
- e. **Project Evaluation** – That the originating financial institution properly conducted the evaluation of the borrower's project feasibility study.
- f. **Credit Worthiness of Borrower** – That the originating financial institution has verified the credit worthiness of the borrower at the time of loan approval.
- g. **DOSRI Accounts of the Financial Institution** – That the directors, officers, stockholders and related interests of the originating financial institution are not in any way related/connected with the borrower.

20. *Accounting System*

- a. The borrower shall open a deposit account (year and/or savings) with the originating financial institution for the depository of all proceeds of sales, assets, etc. and all disbursements thereof of the borrowers with no compensating balance requirement.
- b. A uniform accounting system as may be prescribed by the GFSME in accordance with CB rules will be followed by all originating financial institutions or borrowers.

21. *Other Provisions*

- a. The originating financial institutions may, at its option, sit in the Board of Directors of the borrower.
- b. The borrower's books of accounts shall be open to examination by auditors from the GFSME.

List of Accredited Financial Institutions

Commercial Banks:

1. Allied Banking Corporation
2. Bank of the Philippine Islands
3. Commercial Bank of Manila
4. Consolidated Bank and Trust Company
5. Equitable Banking Corporation
6. Far East Bank and Trust Company
7. International Corporate Bank
8. Land Bank of the Philippines
9. Metro Bank and Trust Company
10. Philippine Bank of Communications
11. Philippine Commercial International Bank

12. Pilipinas Bank
13. Republic Planters Bank
14. Security Bank and Trust Company
15. United Coconut Planters Bank

Development Banks:

1. Agribusiness Development Bank
2. Asia Trust and Development Corporations
3. Bangko Makati
4. Bataan Development Bank
5. BPI Agribank
6. Development Bank of the Philippines
7. Luzon Development Bank
8. Northern Mindanao Development Bank, Inc.
9. Palawan Development Bank, Inc.
10. Peninsula Development Bank
11. PISO Development Bank
12. Planters Development Bank
13. Premiere Development Bank
14. Southern Negros Development Bank
15. Urban Development Bank

Qasi/Savings Banks:

1. Banco de Oro
2. Private Development Corporation of the Philippines
3. Savings Bank of Manila

PLENARY SESSION/SUMMARY

A general consensus emerged that the conference provided an excellent opportunity for exchanging experiences acquired in the field among those who are engaged in promoting dairy development in the country.

The participants attached great importance in defining the problem areas and came into a strong conviction at the end of the plenary to stress the **OVERRIDING NEED TO ELEVATE DAIRY DEVELOPMENT INTO HIGHER PRIORITY BY THE GOVERNMENT**. It was noted that while the desire to pursue dairy development among field workers are very strong, support from policy makers is very weak.

The conference gathered the following "sorry state" of the Philippine dairy industry along with proposal for hastening its development –

1. there are millions of lactating cows, buffaloes, and goats in the countryside that are with millions of farmers. Only less than 1% of these

animals are utilized for the production of milk either for the fresh milk or the white cheese market;

2. increasing the number of lactating animal put into production would greatly improve the socio-economic condition in the rural areas;
3. inability to utilize the maximum potential of the lactating animal in the countryside are due to:
 - i. lack of general comprehensive village-level dairy technology in the rural areas (therefore the felt need is technology assessment and transfer of mature technologies),
 - ii. prohibitive cost of even imported small-scale processing equipment and unavailability in the market of locally-fabricated dairy equipment,
 - iii. lack of adequate refrigeration facilities in the rural areas resulting to pre-mature spoilage of raw milk and processed dairy products,
 - iv. general dislike for white milk creating a "poor milk market" for the rural Filipinos. Majority like canned evaporated and sweetened condensed milk, cheeses, milk-based confectioneries, processed cheese, flavored milk and ice cream;
4. every year we import dairy products worth more than \$100 million. Thus, there is a big demand for milk and milk products in this country – a demand which the Philippines has a potential to satisfy through a comprehensible dairy development strategy.

The workshop participants strongly believe that the steps to be undertaken which needs strong support from the government are:

1. on the production aspect – increase number of farmers going into backyard dairy farming by increasing dairy animal holding through the animal dispersal scheme,
2. development of standard processes of preparing different kinds of dairy products, the processes and technologies of which are applicable to small to medium-scale of production,
3. on the marketing aspect –
 - i. sustained nutritional campaign with emphasis on fresh milk drinking in school curricular, radio, print media, etc. all aimed at increasing acceptance and consumption of milk.
 - ii. creation of a distribution system whereby the vulnerable sector/ smallhold producers will benefit from their own milk produce.
4. On the policy-making level
 - i. the creation of a National Coordinating Body to act as consultative council for farmers, cooperatives, processors, consumers, etc. whose main role shall be:

- a) to identify problem areas for PCARRD'S prioritization in allocation of research funds;
 - b) to disseminate information regarding dairy concerns;
 - c) to identify executive policies about dairying;
 - d) to unite into cohesive task force the different government agencies and institutions involved in dairying and promote a strong linkage with the private sectors.
- ii. the appropriation of funds to sustain the programs for dairy development including funds sought from foreign aid.

The conference also noted the following points raised by the speakers:

1. **Magnolia Dairy Farm** emerged as the only surviving dairy enterprise because of a systems approach rather than a piece meal method. **Magnolia** is adoptive of recent breakthroughs in technology i.e. animal stock and feeds and feeding, etc.
2. **Aberdeen Farm** has passed the test but it was emphasized that the timetable they have set in their feasibility studies were not met due to political red tape. **Aberdeen Farm** employed **DTRI** experts all along from conceptualization to operational stages.
3. The **STDC** (**Southern Tagalog Dairy Cooperatives**) experience reported the discontinued support of **PDC** which again was due to some change in government administration as forwarded by the **PDC** participants. **STDC** members however took steps among themselves and sought help from **DTRI** in processing their milk and are now on their own promoting their produce with the guidance of **Agricultural Credit Cooperatives Institute (ACCI)**.

Workshop II

**SUPPORT SYSTEMS FOR THE PHILIPPINES
DAIRY INDUSTRY**

**NATIONAL ACADEMY OF SCIENCE
AND TECHNOLOGY**

BICUTAN , 23 OCTOBER 1986

WORKSHOP II – SUPPORT SYSTEMS FOR THE PHILIPPINES DAIRY INDUSTRY

National Academy of Science and Technology
Bicutan, 23 October 1986

REPORT OF THE OCTOBER 23, 1986 WORKSHOP

Introduction

The workshop was sponsored by the National Academy of Science and Technology (NAST). It was held at the Executive Lounge, NSTA, Bicutan on October 23, 1986 with the theme "Support Systems for the Philippine Dairy Industry." The session opened by Dr. Melecio S. Magno, Acting Secretary, NAST Executive Council.

Workshop papers were presented as listed in the table of contents. The moderator, Dr. Cledualdo B. Perez, Jr. stressed the objective of the day's work, to identify support services needed to sustain a viable dairy industry.

Two invitational papers were also presented and an open forum was held in the morning and in the afternoon. The workshop maintained the three groupings as in Workshop I, Production, Processing and Marketing with designated leaders and rapporteurs. The group report was taken in plenary and recommendations were firmed up. Prof. Pedro O. Ocampo was moderator for the plenary.

The closing remarks was delivered by Dr. Perfecto K. Guerrero and NRCP's support in technology assessment was committed.

WELCOME ADDRESS

Melecio S. Magno

Vice-President, National Academy of Science and Technology

Distinguished Guests, Members of the Core Group and Organizing Committee of this conference, Fellow Academicians, and Friends:

We are gathered here today for the Workshop II on the multi-sectoral conference on dairy development strategies in the Philippines, Workshop II will cover the priority problem areas and issues of the dairy industry.

Let me say something about the involvement of the Academy in this conference. The NAST or Academy is a collegial body of eminent Filipino scientists. Aside from being a recognition body of outstanding achievements in science and technology, one of its important role is to act as an advisory body to the President and the Cabinet Ministers, to various government agencies, and other institutions on policies and issues pertaining to science and technology in the country. As an advisory body, it also promotes a free scientific inquiry and communication as well as improvement of the scientific climate in the country through relevant policy recommendations.

To serve its role as an advisory body, the Academy from time to time convenes round table conferences and committee studies where experts are invited to discuss problems concerning science and technology. From these round table conferences, the academy formulates policy recommendations which are submitted to the President or concerned ministries and institutes through the Science Minister.

The Academy has identified sometime in July the need for a strong dairy industry in the country to:

- Correct our persistent nutritional problem
- Eliminate our heavy dairy importation
- Provide added income to our farmers
- Improve the quality of the milk we are consuming in this country

considering that we have the resources, the land, manpower and the know-how.

During the planning of a round table conference on the development of a strong dairy industry, the Academy learned that DTRI was also in the process of convening a conference towards this effort. The Academy and DTRI joined efforts and resources the same way you are all joining us today to work hand in hand towards the hastening of dairy development in our country.

In behalf of the academy and DTRI, permit me to welcome you all to this workshop.

THE NUTRITIONAL AND HEALTH ASPECTS OF THE DAIRY INDUSTRY

Lina E. Manapsal
Director, Nutrition Service
Ministry of Health

(delivered by Dr. Stella Marie Gonzales)

In view of the comprehensiveness of the subject matter, "The Nutritional and Health Aspects of the Dairy Industry," permit me to address specifically two areas of concern for the Ministry of Health. First, pertains to the Food and Drug standard as provided in Administrative Order No. 132, 1970, re: Regulations prescribing the identity, quality of milk and milk products (B-4: 1), Annex I. Second refers to, the child as consumer, nutritionally vulnerable and at risk of illness and death.

It is no secret that modern dairy industry has advanced respectably in the field of technology. The challenge of continued research has brought about improved dairy products and preparations/recipes of tested nutrient adequacy and acceptability. The MOH recognizes its responsibility in upgrading the present standard on milk and milk products in response to current needs and issues. Nutritional aspect deals with compliance to nutrient requirement and necessarily reflected in proper labelling. Mislabelling is not only cheating but can result in serious untoward effects. The therapeutic value of some milk preparations is essentially a function of strict compliance to standard.

As gathered from the Second Nationwide Nutrition Survey, the average consumption of milk and milk products by all income groups is 18.8 kg compared to 30 kg/year, which is about 63% of the recommended allowance set by the Food and Nutrition Research Institute (FNRI, 1980). *Per se*, milk is considered an expensive food item for the average Filipino family. Reasonably because 90% of our milk is imported, for which the country spends around US \$150 million annually. That the per capita consumption of milk and dairy products increases with increasing income level is shown in Table 1.

The second immediate concern of MOH is the child as consumer. In the process of growth and development, nutrient adequacy or inadequacy renders the child nutritionally vulnerable. Since milk is easily digestible and highly nutritious, it becomes the desirable complete food for the young ones. Easily there are two types of milk drinkers. Those who are economically well-off and consume imported milk sufficiently. In addition, milk based products as cheese, butter, mayonnaise, ice-cream etc., are taken *ad libitums*. Rarely do these children appreciate vegetables

Table 1. Per capita consumption of dairy products by level of income

<i>Item</i>	<i>Less Than ₱250</i>	<i>₱250-499</i>	<i>Annual ₱500-999</i>	<i>Per Capita ₱1000-1999</i>	<i>Income ₱2000-3499</i>	<i>₱3500-6999</i>	<i>₱7000 or Over</i>
				(g/day)			
Milk & Milk Products	10	14	18	36	63	100	100
Fresh Whole Milk	0	N	N	N	1	1	N
Evaporated Milk (Filed/Recombined)	2	2	2	6	11	4	15
Evaporated Milk (Whole)	0	0	N	N	N	0	N
Powdered Milk (Whole and Skimmed)	4	3	5	11	19	27	33
Condensed Milk	4	7	8	13	11	10	15
Milk Products	N	2	2	6	21	58	36
Total Kg/Yr	3.65	5.24	6.57	13.14	30.00	36.50	36.50
Average				(18.8 kg/yr)			

N -- Negligible (Less than 0.5g)

Source: FNRI, 1984. Second Nationwide Nutrition Survey, Philippines, 1982.

NOTE: FNRI (1980) Recommended Allowance is 30 kg/yr.

Table 2. Operation Timbang Results

Year	Total Number of Children Weighed	Nutritional Status									
		Severely Underweight		Moderately Underweight		Mildly Underweight		Normal		Overweight	
		No.	%	No.	%	No.	%	No.	%	No.	%
1979	5,373,081	346,290	6.44	1,411,675	26.27	2,445,811	45.51	1,169,305	21.76		
1980	557,828	18,657	3.34	134,102	24.04	240,929	43.19	164,140	29.42		
1981	3,446,321	125,773	6.34	766,648	22.24	1,418,979	41.17	1,134,921	32.93		
1982	3,926,524	113,345	2.89	728,770	18.56	1,631,592	41.55	1,268,512	32.31	184,305	4.69
1984	4,852,412	105,414	2.17	777,096	16.01	2,005,510	41.33	1,737,674	35.81	226,718	4.67
1985	5,338,626	125,180	2.34	948,307	17.176	2,167,686	40.60	1,847,072	34.60	250,381	4.69

Source: Nutrition Service, Ministry of Health

and fruits. This relatively western type diet can predispose to obesity, hidden allergies and long term degenerative diseases. A few years back, I was informed by a friend, an orthomolecular physician about a study that the excessive consumption of milk and milk products partly explained the delinquent behavior of a group of western children. The theoretical basis is that, in as much as the embryonic origin of the brain, mucous membrane and the skin is the same, it follows that if one develops allergy of the skin and mucous membrane, it is likely possible to develop allergy of the brain manifested as impulsive behaviour. As a health hazard, this needs more in depth investigation. If one can get addicted to coffee, why not cow's milk.

The health sector is firm on its stand on breastfeeding, but even the Breast-feeding Movement cannot survive without support of either sectors. This brings us to the second type of child consumer who belongs to the economically deprived and malnourished population, of which there are 1,073,487 moderate and severely underweight for age, based on 1985 Operation Timbang (3). Table 2.

The main problem of this group is protein energy malnutrition. Depending on the timing, duration and severity of nutritional insult, at its worst death aggravated by recurrent infections. You are well aware of the walking skeletons of Negros.

If ever these children drink milk the most likely available is the foreign donated skimmed milk provided in food assistance programs. Our figure for low birth weight is 18%. Again these newborns are potential third protein energy malnutrition (PEM) cases. At the moment, MOE is tinkering with the idea of milk-bank, this time a human or mother's milkbank.

You have tremendous expertise and the energy to go further, the reason for this workshop. If we really ask the government to support the industry, would one of its objectives be reaching out to the less fortunate child consumer? Do you believe that to give is to receive? Do you think business should be concerned with human enterprise? Do you think it is worth a try? Do you think it's NOW OR NEVER MIND?

Today

We are guilty of many errors and many faults.
 But our worst crime is abandoning the children,
 neglecting the fountain of life.
 Many of the things we need can wait
 The child cannot
 Right now is the time his bones are being
 formed, his blood is being made and his
 senses being developed.
 To him we cannot answer tomorrow
 His name is "TODAY".

References

1. **Second Nationwide Nutrition Survey. FNRI, 1982.**
2. **Food Composition Table – Recommended Allowance FNRI, 1980.**
3. **Alberto Y. Robles, Associate Professor. An overview of dairy development strategies in the Philippines. September 27, 1985. Diamond Jubilee Inaugural Professorial Lecture, Dairy Training and Research Institute, UPLB-CA.**
4. **Operation Timbang Report. Nutrition Service, Ministry of Health.**

Administrative Order
No. 132 s. 1970

SUBJECT: Regulation Prescribing the Standards of Identity, Quality of milk and Milk Products (B-4. 12).

1. Milk is the lacteal secretion practically free from colostrum, obtained by the complete milking of one or more healthy cows and contains not less than:
 - a) 8.25% of milk solids not fat
 - b) 3.00% of milk fat

The name "Milk" unqualified means cow's milk.

2. Carabao's and/or Buffalo's Milk is the lacteal secretion practically free from colostrum obtained by the complete milking of the healthy carabao and contains not less than:
 - a) 8.5% of milk solids not fat
 - b) 7.5% of milk fat
3. Goat's (native) Milk is the lacteal secretion practically free from colostrum obtained by the complete milking of the healthy goat and contains not less than:
 - a) 8.5% of milk solids not fat
 - b) 4.00% of milk fat

4. Pasteurized Milk is milk which has been subjected to a temperature not lower than 63°C (145°F) and holding it continuously at that temperature for not less than 30 minutes, or at least 72°C (161°F) and holding it continuously at that temperature for at least 15 seconds. The milk should be promptly cooled to 10°C (50°F) or lower, provided, that nothing in this definition shall be considered as barring any other pasteurization process which has been recognized to be equally efficient and which is approved by health authorities.
5. Sterilized Milk is milk that has been heated without concentration or appreciable loss of volume to a temperature of at least 100°C for a length of time to kill all the organisms present and shall be delivered to the consumer in hermetically sealed containers and conforms to that standard and quality of milk as defined.
6. Homogenized Milk is milk which has been treated in such manner as to ensure break-up of the fat globules to such an extent that after 43 hours of quiescent storage at 7°C (45°F), no visible cream separation occurs on the milk and the fat percentage of the top 100 cc. of milk in quart bottle or of proportionate volumes in containers of other sizes, does not differ by more than 10%

from the fat percentage of the remaining milk as determined after thorough mixing.

The word "milk" shall be interpreted to include homogenized milk.

7. Evaporated Milk, Evaporated whole Milk, Evaporated full cream Milk, Unsweetened condensed whole milk, Unsweetened full cream condensed milk is the liquid product obtained by the partial removal of water from milk and contains not less than
- a) 25.8% of total milk solids
 - b) 7.8% of milk fat

It may contain one or more of the following optional ingredients:

- 1) Disodium phosphate or sodium citrate or both or calcium chloride, added in a total quantity of not more than 0.1% by weight of the finished evaporated milk.
- 2) Carrageenan or salts of carrageenan in a quantity not exceeding 0.015% of the finished product.
- 3) Vitamin D in such quantity as to increase the total Vitamin D content to not less than 25 U.S.P. units per 29.57 cc. of the finished evaporated milk.

It may be homogenized. It is sealed in a container and so processed by heat either before or after sealing as to prevent spoilage.

- a) When the optional ingredient (2) is added, the label shall bear the statement " _____ added or "with added _____" to retard fat separation.
 - b) When the optional ingredient (3) is present, the label shall bear the statement "with increased Vitamin D or Vitamin D increased", and a quantitative statement of the total Vitamin D content of the finished product.
8. Sweetened Condensed Milk, Sweetened Condensed Whole Milk, Sweetened Full Cream Condensed Milk is the product obtained by the partial removal of water only from milk with the addition of refined sugar (sucrose) or any combination of refined sugar (sucrose) and refined corn sugar (dextrose) to such point that the finished sweetened condensed milk contains not less than
- a) 28.0% of total milk solids
 - b) 8.5% of milk fat
 - c) The quantity of refined sugar (sucrose) or combination of such sugar and refined corn sugar (dextrose) is sufficient to prevent spoilage.
9. Whole Milk Powder (Dried Full Cream Milk, Full Cream Milk Powder, Dry Whole Milk, Milk Powder, Dried Milk) is the powder obtained by the removal of water only from milk and contains

- a) not less than 95% milk solids
 - b) not less than 26% of milk fat
 - c) not more than 5% of water, with or without added Vitamin D
10. Skim Milk or Skimmed Milk is milk from which sufficient milkfat has been removed to reduce its milkfat content to less than 0.50% and contains not less than 8.5% of milk solids not fat.
11. Evaporated Skimmed Milk, Unsweetened Condensed Skimmed Milk is the liquid product obtained by the partial removal of water only from skimmed milk and contains not less than
- a) 20% of milk solids
12. Sweetened Condensed Skimmed Milk is the product obtained by partial removal of water only from skimmed milk with the addition of sugar and contains not less than.
- a) 24% of milk solids
13. Skimmed Milk Powder (Non-fat Dried Milk, Dried Skimmed Milk) is the powder obtained by the removal of water only from skimmed milk and contains.
- a) not less than 95% of solids
 - b) not more than 1.5% of fat
 - c) not more than 5% of water
14. Partly Skimmed Milk Powder (Partly Skimmed Dried Milk) is the powder obtained by the removal of water only from partly skimmed milk and contains.
- a) not less than 95% milk solids
 - b) between 1.5% and 26% of milk fat
 - c) not more than 5% water
15. Reconstituted, Reconstructed or Recombined Milk is a product which results from the recombining of milk constituents with fluid milk or potable water, and which complies with the standards for milk fat and solids-not-fat of milk as defined.
16. Reconstituted, Reconstructed or Recombined Evaporated Milk is a product which results from the recombining of milk constituents with fluid milk or potable water, which complies with the standards for milk fat and solids-not-fat on Evaporated Milk and which has been reinforced in Vitamin A content to a quantity not less than normally found in Evaporated Milk. It may consist one or both of the following optional ingredients
- a) Disodium phosphate or sodium citrate or both, or calcium chloride, added in total quantity of not more than 0.1% by weight of the finished product.
 - b) Vitamin D in such quantity as to increase the total vitamin D content to not less than 7.5 U.S.P. units per 28.35 Gm. of the

finished product. It may be homogenized. It is sealed in a container and so processed by heat either before or after sealing as to prevent spoilage.

16.1 When optional ingredient (b) is present, the label shall bear

- a) the statement "With Increased Vitamin D content" or "Vitamin D Content Increased", such statement to immediately precede or follow the name "Recombined Evaporated Milk", without intervening written, printed or graphic matter, wherever such name appears on the label, so conspicuously as to be easily seen under customary conditions of purchase and use.
- b) a quantitative statement of the total Vitamin D content of the finished product.

16.2 When the Vitamin A content is reinforced to such an extent that the total quantity is more than that normally found in Evaporated Milk, the label shall bear

- a) the statement "With increased Vitamin A content" or "Vitamin A Content Increased", such statement to immediately precede or follow the name "recombined Evaporated Milk", without intervening written, printed or graphic matter, whenever such name appears on the label so conspicuously as to be seen under customary conditions of purchase and use.
- b) a quantitative statement of the total Vitamin A content of the finished product.

17. Reconstituted, Reconstructed or Recombined Sweetened Condensed Milk is a product which results from the recombining of milk constituents with fluid milk or potable water with the addition of refined sugar (sucrose) or any combination of refined sugar (sucrose) and refined corn sugar (dextrose) which complies with the standards for milk fat and solids-not-fat of Sweetened Condensed Milk.
18. Reconstituted, Reconstructed or Recombined Skimmed Milk is a product which results from the recombining of skim milk constituents with potable water, and which contains not less than 8.25% milk solids-not-fat.
19. Reconstituted, Reconstructed or Recombined Evaporated Skim Milk is a product which results from the recombining of skim milk constituents with water and which contains not less than 20% milk solids.
20. Flavored Milk is a beverage or confection consisting of milk to which has been added a syrup or flavor made from wholesome ingredients.
21. Flavored Reconstituted Milk is a flavored milk made from reconstituted milk.
22. Flavored Drink or Flavored Dairy Drink is the beverage or confection consisting of skim milk to which has been added a syrup or flavor made from wholesome ingredients.

23. Malted Milk powder is the product made by combining whole milk with the liquid separated from a mash of ground barley malt and meal, with or without the addition of salt, sodium bicarbonate or potassium bicarbonate in such a manner as to secure full enzyme action of the malt extract and by removing water, and contains
 - a) not less than 7.5% milk fat
 - b) not more than 3.5% of moisture
24. Chocolate drink or chocolate-flavored drink generally consists of fluid skim milk powder, with or without buttermilk powder, and potable water, to which have been added cocoa powder, sugar, stabilizer such as vegetable gums or other thickening agent, and with or without the addition of flavoring agent as salt and vanillin.
25. Buttermilk is a fluid product resulting from the manufacture of butter from milk or cream. It contains not less than 8.25% of milk solids-not-fat.
26. Buttermilk Powder (Dried Buttermilk) is the powder obtained by the removal of water only from buttermilk and contains
 - a) not less than 4.5% butterfat
 - b) not less than 95% total milk solids
 - c) not more than 5.0% moisture
27. Butter is a fatty product exclusively derived from milk and contains
 - a) not less than 80% of milk fat by weight
 - b) not more than 2% of milk solids not fat by weight
 - c) not more than 16% of water by weight
 - d) salt, optional
28. Whey butter is a fatty product derived from whey containing no other fat than milk fat, and contains
 - a) not less than 80% of milk fat by weight
 - b) not more than 2% of milk solids-not-fat by weight
 - c) not more than 16% of water by weight
 - d) salt, optional
29. Lowfat Milk is milk from which sufficient milk fat has been removed to reduce its milk fat content to not less than 0.50% and not more than 2.00%.
30. Reconstituted, Reconstructed or Recombined Lowfat Milk is a product which results from the recombining of milk constituents with fluid milk or potable water and which contains not less than 0.50% and not more than 2.00% of milk fat.
31. Yoghurt is a coagulated milk product obtained by lactic acid fermentation through the action of *Lactobacillus bulgaricus* and *Streptococcus thermophilus*, from cream, concentrated and unconcentrated milk, partly skimmed milk or skimmed milk, with or without the addition of skimmed milk powder, concentrated whey, whey powder cream and sugars.

Flavored yoghurt is yoghurt with added flavoring foods of other flavoring substances and with or without added coloring substances.

Yoghurt and Flavored Yoghurt –

Minimum milkfat content: 0.5% by weight, the milkfat content shall be declared on the label.

Minimum milk solids-not-fat content: 8.5% by weight

Minimum acidity of the product when sold is 0.7 gram of lactic acid.

32. Toned Milk is prepared by the addition of reconstituted skim milk to locally produced milk in order to reduce its fat content to a predetermined standard while maintaining or increasing the contents of solids-not-fat.

Cream

1. Cream is the sweet fatty fluid or semi-fluid separated from cow's milk with or without the addition thereto and intimate mixture therewith of sweet milk and sweet skim milk and contains not less than 18% of butterfat.
2. Light cream, table cream or coffee cream must contain not less than 18% and not more than 30% butterfat.
3. Whipping cream is cream which contains not less than 30% milkfat.
4. Light Whipping Cream must contain not less than 30% butterfat and may contain up to 36% butterfat.
5. Heavy Cream or Heavy Whipping Cream is cream which contains not less than 36% milkfat.
6. Half-and-Half is a product consisting of a mixture of milk and cream which contains not less than 10.5% milkfat.
7. Reconstituted, Reconstructed or Recombined Cream is a product which results from the combination of dry cream, butter or milk fat with cream, milk, skim milk or potable water with or without stabilizer and which complies with milk fat standards of cream.

Filled Milk

1. Filled Milk is the product made by recombining non-fat or skim milk constituents with a mixture of refined coconut oil and corn oil in such manner that the finished product contains not less than 3% total oil content, not less than 8.5% of non-fat milk solids, not less than 2000 U.S.P units of Vitamin A and not less than 400 units of Vitamin D per 411 Gms. (The addition of Vitamin D is optional).
2. Evaporated Filled Milk, Unsweetened Condensed Filled Milk is the product made by recombining non-fat or skim milk constituents with a mixture of refined coconut oil and corn oil in such manner that it contains not less than 6% total oil content, not less than 20% non-fat milk solids, not less than

2000 units of Vitamin A and not less than 400 units of Vitamin D per 411 Gms. (The addition of Vitamin D is optional).

It may contain the following optional ingredients:

- a) Disodium phosphate or sodium citrate or both or calcium chloride, added in a total quantity of not more than 0.4% by weight of the finished product.
- b) Linoleic acid in the total quantity of not more than 4.5% of the coconut oil.

It may be homogenized. It is sealed in a container and so processed by heat as to prevent spoilage. It must contain in its label, in addition to other pertinent labeling requirements, the statements "Prepared from Dry Skim Milk and a Mixture of Refined Coconut Oil and Corn Oil" or "Prepared from Non-Fat Milk Solids and a Mixture of Refined Coconut Oil and Corn Oil" or other words to that effect with such conspicuousness and in such terms as to be read and understood by the ordinary individual under customary conditions by purchase and use.

The label shall bear the name "Evaporated Filled Milk" or "Unsweetened Condensed Filled Milk" without intervening written, printed, or graphic matter between these words. The words "Evaporated" and "Unsweetened Condensed" in such name shall appear in types which shall be smaller than those of the words "Filled Milk". The word "Evaporated" or "Unsweetened Condensed" shall not appear in any part of the labels except as above indicated.

3. Sweetened Condensed Filled Milk, Sweetened Evaporated Filled Milk is the product made by recombining non-fat or skim milk constituents with a mixture of refined coconut oil and corn oil in such manner that it contains not less than 7% total oil content, not less than 22% non-fat milk solids, not less than 2000 U.S.P. units of Vitamin A and not less than 400 units Vitamin D per 411 Gms. (Vitamin D is OPTIONAL), and to which resulting product is added a quantity of refined sugar sufficient to prevent spoilage.

It must contain in its label, in addition to other pertinent labeling requirements, the statement "Prepared from Dry Skim Milk and a Mixture of Refined Coconut Oil and Corn Oil" or "Prepared from non-fat Milk solids and a Mixture of Refined Coconut Oil and Corn Oil, or other words to that effect with such terms as to be read and understood by the ordinary individual under customary conditions of purchase and use.

The label shall bear the name "Sweetened Evaporated Filled Milk" without intervening written, printed, or graphic matter between these words. The words "Sweetened Evaporated" or "Sweetened Condensed" shall appear in types which shall be smaller than those of the words "Filled Milk". The

word "Evaporated" or "Sweetened Condensed" shall not appear in any part of the label except as above indicated.

It may contain the optional ingredients allowed in Evaporated Filled Milk.

The word "non-fat solids" means the product resulting from fluid skimmed cow's milk from which a considerable portion of the water has been removed.

Filled milk when sold or offered for sale should comply with the following conditions:

1. The name of the product, the common name and the quantity of the reconstituting, fortifying, and/or enriching substances and the approximate analysis of the product are clearly indicated on the label, with such conspicuousness (as compared with other words, statements, designs or devices, in the labeling) and in such terms as to render it likely to be read and understood by the ordinary individual under customary conditions of purchase and use.
2. The reconstituting vegetable fat or oil used is a mixture of coconut oil and corn oil, which in every case should be derived locally and not imported. Such mixture shall contain not less than 10% corn oil. The common names of the reconstituting substances (coconut oil and corn oil) shall appear in the statement of approximate analysis of the product.
3. The use of a propriety name in place of "Filled Milk" may be allowed but such products shall be subject to the usual label requirements as well as those indicated therein. If the name Filled Milk is used, there must be no intervening written, printed or graphic matter between the words "Filled" and "Milk".

IMPORTANCE OF FRESH MILK IN INFANTS AND GROWING CHILDREN

By

Rodolfo F. Florentino,
Director, Food and Nutrition Research Institute

(delivered by Dr. Estela Payumo)

Introduction

Milk for purposes of the discussion today is defined "as a fluid secreted from the mammary glands of all female animals that suckle their offspring (1). Throughout the course of history, milk has been hailed as the ideal food for the young.

Its use as food began with the birth of mankind and continued throughout the ages as a staple part of the diet in some cultures. It is believed that the prehistoric lake dwellers of Lake Geneva were already users of milk although the oldest archeological reference to milk were estimated to have existed 4,000 years B. C. in Ur, Abraham's original home. The Old Testament of the Bible makes liberal mention of milk showing its significant part in the diet and rituals of the people in those times (1).

Today, every good textbook in nutrition recommends milk as an essential part not only of the diet of the nutritionally vulnerable groups of infants and young children, but also of the ordinary adult. This fact is well-recognized in highly developed countries where there is widespread use of milk as part of the daily diet. Unfortunately in developing countries, it is still far from becoming a regular part of the diet. In the Philippines, milk and milk products represents only a 1.5% contribution to the total calorie value of the diet (2) whereas in North America, Australia and United Kingdom it is as high as 12% (3).

Nutritional Needs of Infants and Growing Children

Growth and development is fastest at the first year of life so that infants need more of certain nutrients per unit of body weight than other age groups. At 4-5 months, his weight should double from his birth weight and triple at age 1 year. Because of this, he needs proteins for his rapid growth, as well as minerals like calcium for the formation of strong bones and teeth, and iron to prevent anemia. A proper supply of vitamins is essential: vitamin A that helps in keeping normal growth, healthy skin, eyes, teeth, gums and hair; vitamin C to fight common

infections in infancy such as colds; and B vitamins for correct functioning of the nervous system, proper digestion and utilization of nutrients.

Rapid growth continues at the preschool and school age periods so that the need for the body-building nutrient protein continues, too. This is also the age when children are susceptible to infections such as measles, mumps, boils and colds so that an adequate supply of vitamins and minerals is essential. Growing children are also active children. They need carbohydrates and fats to provide sufficient energy (4, 5). Table 1 presents the recommended levels of calories, protein and some of the essential vitamins and minerals needed by infants and growing children (6).

Nutritive Value of Milk

Milk in General

Milk in general consists of "an emulsion of *fat* and a colloidal dispersion of proteins, together with the milk *sugar* (lactose) in the solution." These are accompanied by "various *minerals* (notably calcium and phosphorus), *vitamins*, *enzymes* and various minor *organic compounds*." However, it is low in iron and insufficient in vitamins D and C (3, 7) thus making it only as the nearly perfect food.

Its value as food may be surpassed by other foods in terms of content of one specific nutrient but its uniqueness lies in its being a balanced source of most of man's dietary needs (3). Secondly, the quality of its nutrients enhances and supplements the nutrients present in poorer quality foods (8); for example, it supplements the amino acid deficiency of most cereals. Thirdly, it provides insurance against deficiencies in the diet basically because it is a nearly complete source of nutrients.

Breastmilk is the only single complete food and the best type of milk which the mother could give for the first six months of life. Aside from containing the nutrients found in other types of milk, it has properties not present in other milk which offer advantages for the infant namely:

- anti-infective properties because of anti-bodies to fight infection in the early months.
- anti-allergic properties which protect him from allergic diseases like infantile eczema.
- easy digestibility because it contains more lactalbumin, an easily digestible form of protein.
- laxative effect which clears the newborn's bowels of the dark green or blackish matter (9, 10).

Fresh Milk

The milk of large domesticated herbivorous animals such as the cow, buffalo, goat, etc. has been useful to man as food. In general the milk of these animals

Table 1. Recommended dietary allowances for Filipino infants and growing children for certain nutrients

Reference Person	Body Wt. Kg	Energy Kcal	Protein Ca	Calcium Ca	Iron mg	Vit. A Activity		Thiamine mg	Riboflavin mg	Nicacin (mg equivalent)	Ascorbic Acid mg
						Retinol Equivalent	I.U.				
Infant: 6-11 mos	9	970	25	0.6	9	250	1800	0.5	0.5	6	30
Child : 1-3 yrs	13	1310	26	0.5	6	250	1800	0.7	0.7	9	35
6-6 yrs	18	1640	32	0.5	8	325	2300	0.8	0.8	11	45
7-9 yrs	24	1870	37	0.5	7	400	2800	0.9	0.9	12	55
Boy : 10-12 yrs	32	2270	43	0.7	11	500	3500	1.1	1.1	15	65
Girl : 10-12 yrs	35	2170	48	0.7	18	500	3500	1.1	1.1	14	70

contains more minerals and protein than human milk. Furthermore, the nutritive composition of milk differs not only among species but also within species and breed so that the values in tables can only serve as general guides (10, 11). Table 2 presents the values of major constituents of good quality milk of different species including humans.

Table 2. Composition of whole milk from cow, carabao, goat and human (per 100 g milk)

<i>Components</i>	<i>Milk from Cow^a</i>	<i>Carabao^a</i>	<i>Goat^a</i>	<i>Human^b</i>
Moisture (g)	87.4	80.1	85.4	88.1
Protein (g)	3.3	5.4	3.9	1.5
Fat (g)	3.6	9.5	4.3	3.2
Lactose (g)	5.0	4.2	5.6	—
Fiber (g)	0	0	0	—
Ash (g)	0.7	0.8	0.8	0.2
Ca (mg)	137	216	98	34.0
P (mg)	74	101	78	20.0
Fe (mg)	0.6	0.2	2.7	0.2
Na (mg)	—	—	—	15.0
K (mg)	—	—	—	41.0
Retinol	25	35	25	40
B-carotene equivalent	20	30	20	30
Thiamine (mg)	0.04	0.04	0.05	.02
Riboflavin (mg)	0.18	0.18	0.27	.07
Niacin (mg)	0.1	0.1	0.1	0.2
Ascorbic acid (mg)	2	2	—	4.0
Food energy (calories)	65	123	76	62.0

Sources:

^aFNRI (1968). Food Composition Table Recommended for Use in the Philippines

^bWoot-Tsuen Leung, R. R., Butrum and F. H. Chang (1972) Food Composition Table for Use in East Asia.

Dietary Allowances and Intakes for Milk

In the Philippine Recommended Dietary Allowances (RDA), whole milk is recommended only for selected age groups namely: infants (6-11 months), pre-schoolers (1-6 years), schoolchildren (7-12 years), elderly (70 years and over) and all ages of pregnant and lactating women (12, 13). Table 3 presents the RDA for whole milk for Filipino children.

In order to understand the rationale behind these recommendations, it should be made clear that in the context of a developing country like the Philippines, what matters most is for the population to meet their nutrient requirements using the

prevailing meal patterns in the country. Thus, the Philippine RDA does not include whole milk for other adults firstly because whole milk is not a regular part of the adult meal pattern and secondly because the normal adult can derive nutrients present in milk from other food sources. However, for the nutritionally vulnerable groups of infants, preschoolers, pregnant, lactating and elderly, milk is recommended since their usual meal patterns cannot cope up with the nutrient requirements of their special physiologic conditions.

Table 3. Recommended dietary allowances (RDA) for Filipino children per day for whole milk by weight and household measure

	<i>Recommended Amounts</i>	
	<i>E.P.g</i>	<i>Cups</i>
Infant (6-11 months)	480	2
Child		
1-6 years	240	1
7-9 years	150	2/3
Boys		
10-12 years	100	1/2
Girls		
10-12 years	100	1/2

Source: FNRI (1983). Tables II and III of the Philippine RDA

According to the second national nutrition survey of the Philippines done in 1982, consumption of milk and milk products was 44 g per capita per day (2) too far off from even the lowest recommended level of 100 g for older schoolchildren. Data taken during the same survey indicate that intakes of fresh milk among children were much lower as shown in Table 4 below.

Table 4. Per capita intakes of fresh milk in grams among Filipino children, 1982

<i>Groups</i>	<i>Age</i>					
	<i>All</i>	<i>6-11 mos.</i>	<i>1 year</i>	<i>2 years</i>	<i>3 years</i>	<i>4 years</i>
Children	120	—	—	—	—	—
Male	1.16	0.00	1.59	0.81	0.00	2.25
Female	1.24	0.00	0.00	1.34	2.14	1.40

Source: FNRI

Milk Supply Situation in the Philippines

Preliminary data from the Food Balance Sheet for CY 1982-84 gives a picture of the most recent milk supply in the country. These data indicate that domestic production of milk increased at an annual rate of 1.5% from 1982 to 1984. As in the previous years, the supply of milk and milk products was augmented largely by imports mostly in the form of dried powdered milk. However, there was a recent slump in the importation of these products to as low as 25.1% from 1982 to 1984. In 1984, the country produced only 1.9% of its gross available supply for this food group. Also, for the period 1982-84, its per capita supply continued to be way below the sufficiency level (14). Table 5 shows production and supply data for milk and milk products during the period.

Table 5. Production and gross available food supply of milk and milk products in the Philippines: CY 1982-84

Type of Data	1982	1983	1984
	<i>In metric tons AP</i>		
PRODUCTION	11,450	11,600	11,807
Percent Increase (Decrease)			
1982-83 - 1.31			
1983-84 - 1.78			
NET IMPORTS	1,033,828	863,601	581,621
Gross Available Food Supply	1,049,278	855,201	593,428
Percent Increase (Decrease)			
1982-83 - (18.49)			
1983-84 - (30.61)			

Source: NEDA (1986). Food Balance Sheet of the Philippines, CY 1982-84 (Preliminary Report).

Despite the large amount of importation prior to 1982-84, the supply of milk and milk products remained inadequate for the nutritional requirements of the population. After the reduction of imports, daily per capita supply went down to 44.9 g in 1982 to 30.2 g in 1984, very much farther below the recommendations set at 95.6 per capita per day. Rate of sufficiency gradually dropped from 59.3% in 1982 to 31.6% in 1984 (14).

Conclusion

The information presented in this report indicate the need for building the supply of fresh milk particularly for infants and growing children.

1. Infants and growing children need nutrients which are mostly found in milk. Milk is rich in protein for body-building of growing children as well as carbohydrates and fats as sources of energy to support their active life. It provides calcium for the formation of strong bones and teeth; vitamin A needed for their normal growth and healthy skin, eyes, teeth, gums and hair; and B vitamins for regulating the various systems of the nerves, digestion and utilization of nutrients.
2. The consumption level of milk, particularly fresh milk is very low among children.

Despite the recognized need of milk in the diet because of its nutritive value, consumption of milk in the Philippines in general is very low, much less with regards to fresh milk among young children.

3. Fresh milk will augment the supply of milk needed by infants and growing children.

The present milk supply in the country is inadequate and whatever supply is available comprises mostly of imported and therefore expensive powdered milk. The inadequate milk supply, high prices of imported milk, coupled with the low purchasing power of the population all interplay resulting in the deprivation of this important commodity among the young children. Making milk available from local sources in the form of fresh milk is therefore important if government is to aim at helping these children attain their optimum growth and development.

References

1. Crumbine, Samuel J. and James A. Tobey (1929). *The Most Nearly Perfect Food: The Story of Milk*.
2. Food and Nutrition Research Institute (1984). *Second Nationwide Nutrition Survey, Philippines, 1982*.
3. Food and Agriculture Organization (1972). *Milk and Milk Products in Human Nutrition*.
4. Valdecanas, Ofelia G. and Zenaida V. Narciso (1977). *Teaching Guide on the Nutrition Bulletin Reading Forum: Minicourse Series on Fresh Milk II. Everyone Needs Fresh Milk*. FNRI Publication No. 162a.
5. Roce (1986). *Vitamins in Fact and Fable*.
6. Food and Nutrition Research Institute (1983). *Table 1 – Recommended Dietary Allowances for Filipinos per Day for Specific Nutrients*.
7. Advincula, Marietta M. (1973). *Nutrition for Children, Mothers and the Aged*.
8. Food and Agriculture Organization (1972). *Payment for Milk on Quality*.
9. Cameron, Margaret and Yngve Hofvander (1983). *Manual on Feeding Infants and Young Children*.

10. Food and Nutrition Research Institute (1968). Food Composition Table Recommended for Use in the Philippines.
11. Woot-Tsuen Leung, R.R. Butrum and F.H. Chang (1972). Food Composition Table for Use in East Asia.
12. Food and Nutrition Research Institute (1983). Table III – Recommended Dietary Allowances for Filipinos per Day in Household Measures.
13. National Economic and Development Authority (1986). Food Balance Sheet of the Philippines CY 1982-84 (Preliminary Report).

RESEARCH AND DEVELOPMENT IN DAIRY PRODUCTION

Alberto Y. Robles

*Associate Professor, Dairy Training and Research Institute
College of Agriculture
University of the Philippines at Los Baños*

Introduction

The irony of dairy production in the Philippines is, we produce so little amount of milk and yet we have problems of marketing such product.

The value of our milk and milk products import ranged from US\$70 to \$148 million FOB for the period 1977 to 1985 (10). This is considered a big depletion in our foreign currency.

Mention have been made regarding the problems and prospects of the beef and dairy industries in the Philippines (15), dairy development strategies (16) and an integrated research and development (R & D) of the Dairy Training and Research Institute (DTRI) College of Agriculture, University of the Philippines at Los Baños (17).

Research Program

Dairy production R & D is categorized into four major problem research areas as identified in the DTRI five-year development plan (3):

- Feeding and Management
- Breeding and Physiology
- Animal Health
- Forage Crops

Most research activities of the institute are designed to accommodate undergraduate and graduate students. The thrust is to answer the primary objective of improving methods to increase the output and raise the efficiency of the dairy industry. The stated objective is the term of reference given to Mr. McLaughlin in 1958 by the Food and Agriculture Organization (FAO) of the United Nations which led to the establishment of DTRI in 1962 (2).

Some private beef and dairy farms like Ansa, Monterey, Aberdeen, Xanadu, Katigbak and others are kind enough to allow UPLB students to conduct performance evaluation on their animals. This type of research linkage and cooperation

is helping the inadequate facilities of DTRI tremendously. More of this private and academe research relationship should be encouraged to answer the general theme of this multi-sectoral conference, "Hastening Dairy Development in the Philippines." The receptiveness of the private sector to the academe is one of the reasons that contributed to the speedy development not only of livestock and poultry industries but general agriculture in countries like U.S. and Europe. Under this environment, the R & D of college and state universities are focused on the perceived and actual problems facing the farmers and the industry concerned.

The succeeding paragraph will now review very briefly some significant output of the DTRI R & D in dairy production. These are published in journals, annual reports, bulletins and have been presented in seminar workshops.

Feeding and Management

This is an area which received immediate attention by the DTRI researchers. The first technical bulletin of the Institute regarding chemical composition, nutrient content and potential milk producing capacity of fresh tropical herbage was published in 1966 (5). The highlights of which are as follows:

- a) Dry matter intake (DMI) of approximately 2.5% of liveweight may be expected of grazing cattle.
- b) Grass are more nutritious in wet season than during the dry period of the year.
- c) Most tropical grasses, grazed rotationally at interval of 20 to 30 days have sufficient amount of digestible crude protein (DCP) for maintenance and production of about 10 kg milk per day, but the total digestible nutrient (TDN) would limit milk output to not more than 5 kg per day (Figure 1).
- d) DCP content of herbages is more variable than TDN. Some grasses contains DCP that are insufficient to support body maintenance to an output of 20 to 25 kg milk daily and TDN to support 4 to 7 kg of milk per day. Corresponding values for legumes ranged from 25 to 40 kg and 3 to 6 kg of milk per day.

Comprehensive research on guinea grass for cattle and water buffalo (7) done at the institute facilities indicated the following:

- a) Dry matter yield ranged from 1.5 metric tons (mt) at 36-day harvest intervals to 7.1 mt/ha. at 75-day harvest intervals. This is translated to a carrying capacity of 4 cows per ha. annually at the more frequent cutting intervals and twice this number if cut at approximately two months intervals.
- b) DCP value decreased from seven to less than 3% between one and three months regardless of season but TDN remain constant at different

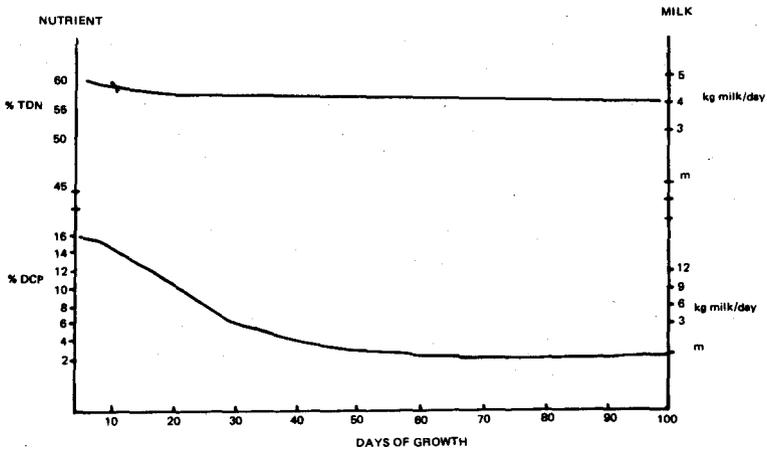


Fig. 1. Effect of maturity on digestible crude protein (DCP) and total digestible nutrient (TDN) on milk producing potential of tropical herbage.

stages of maturity in the wet season (50 to 53%) but declined during the dry season (56 to 46%).

- c) DMI of 2.1% of liveweight was similar for Holstein Friesian (HF) bulls, water buffalo bulls and lactating HF-Red Sindhi crossbreds.
- d) Digestion coefficients of dry matter and crude fiber were significantly higher (P.01) for buffaloes than HF averaging an advantage of 8% units.

The practical aspects of this research lead to the following recommendations:

- a) Optimum harvest is about two months.
- b) Milk yield is severely limited by low protein content at growth stages later than 40 days; but when concentrates are given to meet the energy requirements for 10 kg milk per day, total dietary protein is more than adequate.
- c) Herbage should contain 6% C.P. with a digestibility of at least 47.5% to ensure animals in positive nitrogen balance.
- d) Net income over cost per unit of land in dairy operation can be improved by increasing stocking capacity and production per cow.

Similar studies conducted for Napier grass (13) and Stargrass (24) indicated similar trends and pattern of results.

Management studies both for growing animals and lactating cows show that indoor during daytime and outdoor grazing during nighttime gave the highest liveweight gain (2), and milk production (6). Table 1 shows the effect of feeding management systems for the DTRI cows. The indoor and outdoor feeding system

Table 1. Milk production and days in milk of the DTRI cows managed under three feeding system

Feeding System	Days in Milk	Milk Production		
		Actual	120-day	305 ME
A-1	179	1759	1345	2982 ^b
A-2	240	2473	1410	3142 ^b
A-3	214	2499	1565	3544 ¹

a, b Mean with different superscripts are significantly different (P/.05).

A-1 = Indoor, fed with corn silage.

A-2 = Outdoor, day and night grazing.

A-3 = Indoor-Outdoor, fed with corn silage of grazing at night.

Source: Hebron (1980).

(A-3) allows the cows more comfort and better opportunity to consume more nutrient during nighttime grazing coupled with indoor soilage or silage feeding. The 305 mature equivalent milk production is higher for the A-3 compared to A-1 and A-2. More recently, farm and industrial by-products were given focus in nutrition research:

- a) Inclusion of dried poultry manure (DPM) and ipil-ipil leaf meal (ILM) on rice straw diet gave an average daily gain of 0.5 to 0.6 kg from yearling to breeding and 0.40 to 0.46 kg from breeding to calving. Rice straw was maintained at 35% of the total diet (22).
- b) DPM and ILM can be used at levels of 10 to 20% and 10 to 30% of dry matter respectively in corn-silage based complete return for lactating cows having passed peak milk production (4).
- c) None of the DPM and milk samples examined was positive for the level of antibiotics (chloramphenicol and furazolidine) tested. Similarly no detectable residues of 3 pesticides (methyl parathion, BPMC and chlorphysisfos) were found in milk and blood samples (22).
- d) Urea treatment significantly (P/.01) increased voluntary intake of rice straw and total dry matter intake by the heifers. As feeding technique it appears more economical to improve feeding value of rice straw by urea treatment than through concentrate supplementation (8).
- e) Rice straw can be utilized as the sole roughage source for dairy cows provided that concentrate supplement with high protein (18-20% CP) and energy (68-70% TDN) is given at the rate of 1 kg concentrate for every kg of milk produced. This is equivalent to 60:40 concentrate roughage ratio (1).

Nutrient requirements of dairy calves and lactating cows appear to be higher here in the humid tropics compared to USNRC sets of standards. Stall-fed lactating cows require 30% more of the USNRC standard (19). Dairy calves require higher intake of dry feed and protein and gain less (0.58 kg ves. 0.76 kg) than dairy calves of similar body weight in U.S. (23).

Breeding and Physiology

The milk production performance of upgraded, crossbred and purebred dairy animals in the Philippines and in Southeast Asia has been reviewed (18). Table 2 indicates the comparative performance analysis utilizing the top 12 cows in each blood group. With culling and selection the 50:50 Zebu (Z₁): Holstein (H) crosses (Brahman based) could equal and even surpass the milk production of the purebred Holstein under Monterey farm conditions (12). This is a very significant finding which indicates the great potentials of using our beefy herd to produce local dairy animals. Selection pressure should be at least 50% among the first generation to realize high milk production. A large number of population is required. The Cubans utilized at least 40,000 Zebu cows and the foundation herd with 50 top quality Holstein semen and 45 top quality Brahman bulls to come-up with their Siboney de Cuba (5/8 Holstein:3/8 Zebu) producing high levels of milk production under tropical conditions (14).

Table 2. Comparative performance analysis utilizing the top 12 cows in each blood group

Blood Composition	Lactation	Actual	Milk Production		
			Range	120 days	305 ME
	(day)		----- kg. -----		
50Z:50H	322 ^a	4608 ^a	3718-6642	2020 ^a	4482 ^a
25Z:75H	258 ^c	2568 ^c	1973-3768	1372 ^c	2934 ^c
100H 313	313 ^b	3490 ^b	1612-5958	1649 ^b	3371 ^b
% C.V.	18.90	25.76.9		18.08	18.56

Column means with different superscripts differ significantly (P/.05)

Z = Zebra

H = Holstein

Source: Pangilinan and Robles (1985).

Growth performance of the half-bred Zebu (z): Holstein (H) over the 25%Z: 75%H and 100%H was only evident at the initial stage and levels up with the same yearling weight or 259 kg on the average with an average daily gain of 0.8 kg (12). On the aspects of reproductive performance, DTRI animals group into 3 blood compositions indicates that crosses with 87.5% Holstein and above are more dif-

difficult to impregnate (6). Similar trends were found for Zebu:Holstein crosses in a commercial beef and dairy farm (12).

In semen handling, damage to spermatozoa was significantly less when the semen put in straws, 2 inches above the liquid nitrogen was level for 30 min. prior to total emergence in the tank (11).

Embryo transfer (ET) conducted at Ansa farms in 1984-85 shows successful superovulation, transfer and dropping of live ET calves. Eighty seven crossbred Brahman cows served as recipient cows (RC). Ninety three embryos were transferred coming from 19 donor cows (DC). Six RC's received 2 embryos in a bilateral ET method. Twenty eight (32.7%) RC's were confirmed pregnant at 90 days. There were 25 unassisted live calvings or 96.2%, 1 abortion, two deaths of cystic hematuric at late pregnancy. Of 6 RC's with two embryos transferred, two had twins two had single calves and two empty (9).

Animal Health

In general, herd health of upgraded, crossbred and purebred animals require more care and attention than Zebu cattle. Routine vaccination of all stocks against foot and mouth disease and hemorrhagic septicaemia, and vaccination of calves with animal testing for tuberculosis and brucellosis with culling of reactors. Mastitis was the most serious disease in the herd and the incidence was reduced with culling and preventive measures. Routine spraying of all cattle against ticks and drenching of calves against internal parasites were also essential. Results of tuberculosis testing in the backyard dairy, farmers involved in the milk collection scheme showed negligible percentage of positive reactors which are not included for milking.

At present improving the performance of dairy animals through biological control of bovine ticks using *stylossanthes* species is for implementation.

Forage Crops

There were 91 grasses and 61 legumes introduced in 1964, but at present only four improved grasses such as Napier, Para, Guinea and Stargrass remain, with three legumes (centro, siratro, and glycine). Results indicate that on planting mixed pastures, land preparation followed by sowing of grass and their legume one month after is suggested. Ipil-ipil as legume tree was also studied as feedstuff for dairy animals. In the DTRI-FYDP (3) and integrated R & D (17) of DTRI, determination of trace mineral status of Philippine soil and forages, forage and fodder conservation, utilization studies are being given emphasis.

Suggested Policies to Hasten Dairy Development

1. Strong research and development linkages between the private sector and academe is needed.

2. R & D should consider production, collection, processing, packaging and marketing problems in a team approach to integrate the results and come up with a more efficient, economical and profitable dairying in the Philippines.
3. The government should lead the way in transferring our beefy herds to dairy type animals following the Monterey experience and shown by Cubans in developing their own Siboney de Cuba.
4. A breeding scheme should be followed at national level due to the wide variations in crossbreeding involving Zebu and temperate *Bos taurus* breeds.
5. A need for dairy processors to establish dairy farms or absorb local milk production as being done in Indonesia.
6. Strong political will is needed to develop our dairy industry which seems to be in the state of hibernation.

References

1. Adiarto, 1985. Varying levels of concentrate supplementations in rice straw-based diet for milk production. M.S. Thesis, UPLB.
2. DTRI. 1968. Dairy Training and Research Institute, Philippines FAO/OF:50 PHI-4. Final Report. UNDP.
3. DTRI. 1983. Five year development plan (1983-87) Dairy Training and Research Institute, College of Agriculture, University of the Philippines at Los Baños.
4. Escano, Dr. R. and L. T. Trung. 1985. Protein supplementary values of *Leucaena* and dried poultry manure to corn silage for dairy cows in mid lactation. 22nd annual convention of the PSAS. Nov. 21-22, PICC.
5. Hardison, W.A. 1966. Chemical composition, nutrient content and potential milk producing capacity of fresh tropical herbage. Tech. Bull. No. 1. DTRI-UPLB.
6. Hebron, P.P. 1980. Performance of DTRI dairy herd under three feeding management systems. Ph.D. dissertation, UPLB.
7. Johnson, W.L. 1966. The nutritive value of *Panicum maximum* (Guinea grass) for cattle and water buffaloes in the tropics. Ph.D. dissertation, Cornell U.
8. Lohani, M.N., L. T. Trung, S.C. Bantugan, and R.R. Lapinid. 1985. Feeding value of urea-tested rice straw with limited supplementation to yearling heifers. 22nd annual convention of the PSAS. Nov. 21-22, PICC.
9. Martin, O.C., A. V. Nocom, E.S. Sanchez and J.M. Malabanan. 1985. Bovine embryo transfer at Ansa farms: A case report. 22nd annual convention of the PSAS. Nov. 21-22. PICC.
10. NEDA. 1986. National Economic Development Authority. Philippine Yearbook, National Census and Statistics Office, Manila.
11. Palad, O.A. and J. L. San Pedro. 1985. Cryopreservation and freezing techniques for buck semen. 22nd annual convention of the PSAS. Nov. 21-22. PICC.
12. Pangilinan, E.T. and A. Y. Robles. 1985. Zebu-Holstein Friesian crosses for milk production. 22nd annual convention of the PSAS. Nov. 21-22. PICC.
13. Robles, A. Y. 1971. The feeding value of Napier grass (*Pannisetum purpureum* Schum.) for cattle and carabao.
14. Robles, A. Y. 1981. Impressions on the dairy industry in Cuba. *Livestock and Poultry* 9(3):6.
15. Robles, A. Y. 1982. Problems and prospects of the beef and dairy industries in the Philippines. *Anim. Hus. and Agric. J.* 16 (5):12.

16. Robles, A. Y. 1988. An overview of dairy development strategies in the Philippines. Diamond jubilee inaugural professorial lecture. Sept. 27. Institute of Animal Science, College of Agriculture, UPLB.
17. Robles, A. Y. 1985a. Integrated research and development program of the Dairy Training and Research Institute. *Anim. Hus. and Agric. J.* 19(7):14.
18. Robles, A. Y. 1986. Performance of purebred and crossbred dairy animals in Southeast Asia. *Anim. Hus. and Agric. J.* 20(6):6.
19. Trung, L.T. and A. L. Ordoveza. 1978. Varying energy levels for lactating cows under tropical conditions. *Phil. J. Vet. Anim. Sci.* 4(3):149.
20. Trung, L.T., E. E. Abenir, R. Rustamedji, A. Y. Robles, B. R. S. Arambulo and R. R. Lapinid. 1985. Supplementary values of dried poultry manure and (*Leucaena-leucocephala* Lam de Wit) to corn silage for early lactating cows. *Phil. Agr.* 68:189.
21. Trung, L. T., L. P. Palo, J. M. Matias, E.E. Abenir, R. R. Lapinid and T. A. Atega, 1985. Dried poultry manure and leucaena in rice straw-based blended diets for dairy cattle. 22nd annual convention of the PSAS. Nov. 21-22 PICC.
22. Trung, L. T., L. P. Palo, T.A. Atega, J. M. Matias, R. R. Lapinid, V. L. Barraquio and B.R.S. Arambulo. 1985. Evaluation of poultry manure as feeds and residual effects of rice straw/poultry manure feeding. 22nd annual convention of the PSAS. Nov. 21-22. PICC.
23. Valero, H.R., A.Y. Robles and A. L. Ordoveza. 1981. Effects of two protein levels and housing systems in the performance of dairy calves. *Phil. J. Vet. Ani. Sci.* 7(1):49.
24. Velasco. N.B. 1978. The nutritive value of stargrass (*Cynodon plectostachyus* K. Schum Pilger) at different stages of regrowth in combination with centrosema (*Centrosema pubescens* Benth) for cattle and carabaos. M.S. Thesis. U.P.L.B.

RESEARCH AND DEVELOPMENT IN DAIRY TECHNOLOGY

Clara L. Davide

*Associate Professor and Head, Dairy Chemistry Section,
Dairy Training and Research Institute (DTRI),
College of Agriculture, University of the Philippines at Los Baños,
College, Laguna, Philippines*

Dairy industry, though considered one of the backbones in the economic and nutritional development of a country, has remained underdeveloped in the Philippines. Attempts of the government to institutionalize and speed up its development by creating the Philippine Dairy Corporation (PDC) through the Dairy Industry Development Act of 1979, have so far failed to give a significant impact in the countryside. Although the corporation is making some headway, the government is still far behind its target of 20% self sufficiency in milk by 1990, it being dependent on imports for at least 98% of its dairy food requirements (NEDA, Yearbook, 1985). For example, our total milk and milk products importation (NEDA, 1986a) in 1984 amounted to \$65.5 million which increased to \$71.9M in 1985. This is unfortunately a significant drain in the country's foreign reserves.

With the rise in population and the increasing desire of Filipinos for more varieties of dairy products, our dependence on importations of milk and milk products could possibly increase further, but economic constraint may not always allow this. Therefore, there is the need to develop our own dairy industry to substitute imports, provide more nutritious dairy foods to our more vulnerable age groups and alleviate malnutrition in our country.

Milk is considered the most unique and ideal food for man, meeting the nutritional needs of the body than any other single food (Figure 1). It contains proteins, carbohydrates, fats, minerals, vitamins and other substances in fairly suitable proportions. The amount in which these occur in milk varies according to its source.

Carabaos, goats, and cattle are abundant in the Philippines particularly in backyard farms. Our 1985 inventory for animals shows that there are 2.98 million (M) carabaos, 1.78 M cattle and 2.19 M goats which could be tapped as major milk resources (Table 2). If only we could milk every female in the total population, then we would have more milk and milk products for our domestic consumption. Considering that only 11.65 M hectares of the country's 18 M hectares of alienable and disposable lands are being fully utilized for agricultural production (NEDA Yearbook 1985), the potentials for dairy farming are still great.

Objectives

This paper endeavors to: 1) draw a picture of the present state of the art in dairy technology; 2) highlight some problems, constraints and/or issues associated with technology generation; and 3) give suggestions/recommendations to consider in policy formulations important in the improvement and development of appropriate local technologies in dairy processing.

Characterization of Cow, Goat, Buffalo and Carabao's Milk

A substantial amount of work has been done to establish the characteristics of local cow, buffalo, carabao and goat's milk which are basic information for quality control and in the generation of dairy processing technologies. Milk quality and adulteration problems are commonly encountered in government milk collection programs. Cow's milk seems to be the most studied milk in the country and therefore serves as the control or reference milk in many research investigations.

The swamp buffalo or carabao is primarily utilized for farm work. Only a few farmers milk their animals for additional income and yet the pure white milk of carabao is significantly richer in composition with 2-3 times as much fat as cow's milk (Davide *et al.*, 1969) and has higher concentrations of proteins (Davide and Pascual, 1975) and minerals, (Davide and Domingo, 1971) than either cow, goat or buffalo's milk (Table 3). Its higher Ca content makes it faster to coagulate by rennet, thus requiring less coagulant to give a firmer curd. Buffalo's milk generally ranks second to carabao's milk as far as gross composition is concerned (Davide *et al.*, 1977) and is similarly white.

Goat's milk, although containing slightly higher fat, proteins and minerals than cow's milk but is whiter (Davide *et al.*, 1985), does not seem to get much attention from the processors because of its "goaty" flavor. This local prejudice against goat's milk has been partly overcome by the development of local technologies for its processing into more acceptable and nutritious forms (Davide *et al.*, 1983; 1985; 1985a).

Fluid Dairy Products

Cow's milk is generally considered the type of pasteurized milk most preferred by fresh milk drinkers in our country while carabao's milk seems to be the choice of local cheesemakers for our indigenous white cheese industry, understandably because it is white and gives more cheese yield due to its higher protein and fat contents.

The high fat content of carabao's milk can be lowered to 3% or even less by toning it with fresh cow's milk or reconstituted skim milk and still give a highly

acceptable and nutritious drink, thus increasing local milk supply. Carabao's milk can also be toned with skimmed coconut milk and produce a pasteurized milk with physical and chemical properties simulating those of pasteurized cow's milk.

There is an increasing demand for yogurt; however, technologies for its local production are largely limited to commercial scale. There is a need to develop simpler practical methods for its fermentation, exploiting the warm ambient conditions to minimize input in facilities and equipment. Having very high total solids, carabao's milk could be tapped for this.

In an experimental scale, carabao's milk was processed into sweetened/condensed milk by evaporation or by addition of skim milk powder to concentrate it (Parala, 1976). While its quality and general acceptability were considered inferior to that of the commercial condensed milk, the method is suitable for prolonging the shelf life of milk at the farm level.

Cheese, Curd, and Milk Coagulants

The Philippines produces a very limited variety of native natural cheeses which are either acid- or enzyme-coagulated but all can be classified as a soft cheese type. These include the Sta. Cruz, Lumban, San Migue, Danao, and Gandara cheeses among others but they differ in manufacturing technique and type of milk coagulant used. Vinegar is the coagulant of choice for the acid-coagulated variety while the extract from the dried abomasum of adult carabao or cattle is utilized for the enzyme-coagulated cheese. More than 99% of the backyard cheesemakers do not pasteurize their milk during cheesemaking, one reason for the shorter shelf life of most traditional Kesong Puti.

Most attempts to modify the traditional way of making Kesong Puti were on improving its keeping quality and invariably included pasteurization of milk and starter addition which therefore prolonged its manufacturing procedure (Rajbhandary 1970; Arpon, 1971; and Gomez, 1971). Unfortunately these changes were hardly adopted by the cheesemakers.

An improved DTRI technology for large scale production of fresh soft cheese from carabao's milk or its blend with cow's milk (Dulay, 1970) adds cheese starter and salt to the milk and pasteurizes it before coagulation. After overnight draining this white cheese has better organoleptic qualities and longer shelf life than the Kesong Puti made by the traditional way.

Another modification for fresh soft cheese production utilizes cow, goat or carabao's milk and needs no cheese starter (Davide, 1983). It clots the pasteurized and lukewarm milk with IFS-6 rennet substitute within 30 minutes and after only one hour draining, the finer-textured fresh soft cheese is ready for wrapping.

In recent years new varieties of soft cheese and appropriate technologies for the manufacture of hard and semi-hard ripened cheeses have been introduced. Local modified technologies for both small and large scale production of Blue, Camem-

bert, Cheddar, Edam, Gouda, and Monterey-type cheeses from cow's milk have been developed and extended to dairy students and trainees of UPLB (Davide, 1984). It is doubtful, however, if the private sector is aware of them since the government lacks an orchestrated national program for technology transfer and dissemination.

Relatively little work has been done in the Philippines towards the utilization of goat's milk in cheesemaking, until recently, when DTRI established that goat's milk is excellent for processing into fresh soft cheese with or without starter (Davide, *et al.*, 1985), mold-ripened Blue and Camembert cheeses (Davide *et al.*, 1985b), Cheddar cheese and Edam or Queso de Bola (Davide *et al.*, 1985c), the fruit-flavored soft Queso de Piña (Davide *et al.*, 1985a) and the spicy "Jubilee cheese" with nutmeg (Davide *et al.*, 1983). In the latter two cheeses the spice or pineapple is added to the curd before knitting. These cheeses gained high consumers' acceptance and could be exploited to enhance the utilization of goat's milk. Since these local technologies use low-cost facilities and locally fabricated equipment, the need for the imported cheese equipment, which otherwise could have made cheese-making an expensive venture, is eliminated.

Carabao's milk is traditionally utilized in the production of Kesong Puti and Pastillas de Leche. It is richer in protein, particularly casein, and yields more cheese than goat or cow's milk (Davide, *et al.*, 1986); therefore, let us also exploit carabao's milk to expand the domestic cheese industry and reduce dependence on cheese importations. Studies on its suitability in producing ripened hard and semihard cheeses are lacking. Thus far, its utilization in Cheddar (Villarta, *et al.*, 1972) and Danish-type semihard (Gomez, 1977) cheeses has been tested although its technology has not been further verified and adopted.

Appropriate technologies recently developed by DTRI for buffalo or carabao's milk (Davide *et al.*, 1986) give a highly acceptable Gouda cheese and a blue-type cheese that closely resembles the imported Blue cheese in appearance and quality. It has been observed, however, that hard and semi-hard cheeses made from carabao's milk ripen slower than the cow cheeses. Roquefort, Danablu and other blue-type cheeses belong to the most expensive imported cheeses in our local supermarkets and with the increasing demand of Filipinos for these cheeses, the local production of export quality Blue cheese from carabao's milk must be promoted. An on-going research is also testing carabao's milk for Queso de Bola production in anticipation of a big demand for this cheese especially during the Christmas season.

The scarcity of imported rennet as ingredient in cheese manufacture used to be a major constraint in the expansion of the local cheese industry. However, with the development of local milk coagulants (Davide *et al.*, 1982) and characterization (Peralta *et al.*, 1985) and suitability testing of DTRI-IFS-6 rennet substitute extracted from dried abomasum of adult cattle and carabao (Davide, 1983), many hard and semi-hard ripened cheeses that used to be imported only can now be produced locally in the Philippines with comparable quality (Table 4). One teaspoon

(4-5 ml) of IFS-6 milk coagulant can clot one liter milk at 30-38°C to give a firm coagulum which is ready for cutting in 25-30 minutes.

Another local milk coagulant developed by DTRI is "pararennet", which is extracted from the fresh adult cattle abomasum, with a dilute solution of glacial acetic acid and salt and is used at the rate of one tablespoon per liter milk (Dulay *et al.*, 1985). This method eliminates the tedious drying of the abomasum and therefore is easier to prepare. The extract's shelf-life however, may be shorter than that extracted from the dried abomasa. More researches must be done to test Pararennet's suitability in ripened hard and semihard cheese production and compare it with standard rennet preparations.

The use of market vinegar, agredulce or calamansi extract (Gomez and Momongan, 1983), citric and other organic acids as milk coagulant for fresh soft cheese is widely known and practiced. Acid coagulants are not suitable for hard and semi-hard cheese manufacture where enzyme coagulants are needed for protein and fat breakdown during ripening.

Ice Cream and Butter

Local technologies for backyard and large scale production of ice cream are well established. A study on the production of low-fat ice cream using carabao's milk has recently been concluded (Tan, 1984).

Butter is generally considered food for the rich. A higher yield of white butter is obtained from the more fatty carabao's milk; however, its quality, color, and general acceptability are considered inferior to that made from cow's milk (Evangelista, 1977). The addition of an oil extract from atsuet (annatto) seeds to carabao's milk would give an attractive yellowish butter instead of its normal candle-white appearance.

Milk-Based Desserts and Confections

The manufacture of milk candies or pastillas de leche is a cottage industry in many areas where carabao's milk is regularly produced. Attempts to improve its traditional way of processing have been made and these include the addition of different stabilizers and milk sources (Parducho and Alfuerto, 1982). The use of safe, cheaper and more efficient preservatives to improve its shelf life without refrigeration needs further investigation.

The production of "nata de leche" and vinegar from whey (Gomez *et al.*, 1985), presently a waste product from cheese manufacture, has been tested with success and therefore could be promoted as a low-cost technology for income generation and also to minimize pollution problems in cheese factories.

Lactoflan, a flavored custard-like product developed from a coagulated blend of cow's milk and/or reconstituted skim milk with sugar and starch (Dulay, unpublished) is being market-tested in Los Baños.

Modified Dairy Foods

The Philippines imports a tremendous amount of skim milk powder (SMP) annually (\$35.2 M for 1985) for its recombined and "filled" milk processing to meet local requirements. This is augmented by several thousand tons of SMP received as food aid from the United States to alleviate rural malnutrition; however, this aid is sometimes wasted through misuse and mismanagement.

Along with its efforts to step up local milk production, DTRI also explores the optimum utilization of SMP donated to schools, rural health centers, and depressed communities as food aid. It develops simple and appropriate technologies to process SMP with coconut milk (CCM) as fat carrier into highly acceptable and relatively cheap nutritious dairy foods. Included are the refreshing plain and flavored filled milk drinks that were observed to be very popular among rural school children (Davide), Davide *et al.*, 1985, 1986a), the cheaper low-fat and starterless Cadtri fresh soft cheese and the highly desired pineapple-flavored Niyogurt (Davide *et al.*, 1985e). It has also come up with the cheaper and unique Roquefort-type Niyoblue cheese (Davide *et al.*, 1986b). These products have desirably sensory qualities and are easily gaining acceptance among children and adults in both urban and rural areas. This is significant since it can alleviate the temporary shortage of traditional dairy products.

Problems, Issues, and Recommendations

Lack of Coordination and Government Support in R & D

The country does not have an integrated national dairy research program. So many agencies undertake independent dairy research, compete with each other, and without an effective monitoring body there is a big possibility of duplications.

Inadequate finances or delay in the release of research funds due to too much red tape and the lack of continuity in supporting research and development activities are major constraints in technology generation.

The government should have an adequately funded and closely coordinated research program and must tap international research funding agencies for local researchers. Its researches must be organized in such a way that results and breakthroughs will find their way to dairy processors via a concerted extension network. Some developed technologies needing verification or pilot testing end up in the laboratory level due to lack of funds; thus greater benefits may be attained if funding agencies also include them for support. National dairy research institutions

must not only be streamlined and supported adequately but also linked with other related government agencies.

There is lack of support and participation from the private sector, therefore a closer research linkage and funding collaboration between government research institutions and private industry must be encouraged.

Some bureaucratic procedures that scientists undergo when seeking research support are deterrent to technology generation; therefore, research funding agencies should simplify their requirements of applicants. Local dairy technologists who are also working hard to modify selected foreign technologies to make them adaptable to our own local conditions must also be supported.

High Cost of Dairy Processing Equipment and Packaging Materials

Dairy equipment are very costly since most are made of stainless steel and are imported. Designs suitable to our local conditions must be developed and fabricated locally to reduce cost and encourage processing and product diversification even at the village level.

The invention of low-cost filling or packing machines is still a big challenge to Filipino creativity. Packaging materials, even when locally manufactured, and that includes the labels, contribute a big percentage to the production cost. Researchers have to discover cheaper yet durable materials to substitute the traditional ones. We have to harness the Filipino ingenuity in coping with crisis and resort to improvised facilities and equipment.

Poor Quality of Milk Produced to Backyard Farms

Quality of milk produced in backyard farms is frequently poor and could hardly meet the standards set by big dairy processors. Many farmers still lack information on clean milk production, hence appropriate technologies and facilities for clean milk production and handling must be introduced for adoption. Adopted foreign milk standards imposed by local milk processors on our dairy farmers must be examined to determine if these are practical and suitable for our own local conditions. Local standards for milk and milk products therefore must be established through close collaboration with dairy research institutions and local dairy processors.

"Dumping" Price of Imported Dairy Products

The government lacks the political will to develop local dairying and has allowed the annual importations of huge amounts of milk and milk products of low "dumping" prices. New policies may be formulated to limit the importation of milk and milk products up to certain levels within a specified period and encourage importing processors to buy locally produced milk to substitute part of their processing needs.

Dairy products received as food aid can play a useful part in food security but they tend to depress domestic milk prices and discourage local dairy development. Therefore their utilization must support and complement our own dairy development strategy, not undermine the efforts of our dairy producers, especially that substantial work has already been done to evolve the needed technology in dairy processing.

Thus, there is need to formulate a new national policy to support and strengthen the local dairy industry. We are hopeful that with the formulation of better and sound policies, the integration of all dairy endeavors, and the honest implementation of these policies, our country will have a truly viable dairy industry.

Acknowledgment

Sincere thanks are extended to the National Research Council of the Philippines (NRCP), International Foundation for Science (IFS), and Philippine Coconut Research and Development Foundation (PCRDF) for their generous support of many research and development projects reported herein.

TRAINING AND EXTENSION PROGRAMS FOR DAIRY DEVELOPMENT

Pedro O. Ocampo

*Dairy Training and Research Institute (DTRI)
University of the Philippines at Los Baños, College
Laguna, Philippines*

Introduction

The theme for today's workshop is "Support Systems for Dairy Development." Evidently, training and extension programs are critical support to the growth of the industry. Hence, this paper.

The paper shall give an overview of past and current programs in a generalized fashion. Anyway, most of the participants to this workshop are familiar with many of them. We shall, however, raise some points or issues. Hopefully, the overview and the notes can serve as useful inputs to the workshops this afternoon.

The first part of the paper shall discuss extension programs; the second part, training.

Extension Programs

A. *The Focus*

As with any extension program, extension in dairying is designed to effect changes in the knowledge, attitudes and practices of farmers; it is designed to "transfer" technologies which will result in increased milk production, higher incomes, increased productivities.

A particularity, however, of dairy extension is its objective to promote both dairy and rural development. This particularity emanates from the Dairy Law itself (BP 21), which speaks of accelerating milk production, generating employment and increasing the level of income in the rural areas through dairy production. The law, therefore, has a distinct rural or smallholder-farmer bias. It is in the context of a bias for smallholder farmers that we will discuss extension programs.

B. *The Government Agencies*

Dairy extension programs are mainly undertaken by government agencies. The principal agency is the Ministry of Agriculture and Food through its Bureau of Animal Industry and the Philippine Dairy Corporation. The BAI started its dairy development efforts in 1962; the PDC in 1980. Other agencies are UPLB's Dairy

Training and Research Institute, which first ventured into small-farmer extension in 1968 and the Kilusang Kabuhayan at Kaunlaran (KKK), which became involved in dairy extension in 1982.

It will be observed that the extension programs of all these agencies are linked to a given milk collection scheme. The MAF-BAI projects are in Sorsogon, Albay, Nueva Ecija, Pampanga and Bukidnon. In all of these areas, there is a milk collection arrangement where milk produced by farmers are brought to the BAI Processing Plant(s), for manufacture and sale into a variety of dairy products.

DTRI started milk collection in Southern Tagalog in 1968. Basically, the same arrangements apply. In 1982, this scheme was turned over to the KKK.

The PDC actively involved itself in this activity in 1983.

For all the above schemes the basic features are:

- Farmers produce the milk
- Government provides services
- Government collects, processes and markets the milk.

B.1 *The Nature of Government Services*

In recent years, it has become the fashion in extension to provide "technology package(s)." Dairy extension followed this pattern. A "package" refers to the set of practices and the corresponding support services considered necessary for the successful adoption of a given technology. In dairy production, the technology package consists of:

1. *Provision of dairy animals.* The traditional approach in rural dairy development had been to tap existing animal resources for milking. This strategy failed to generate substantial volumes of milk from the project areas. On the other hand, the enthusiasm of farmers to milk their animals was considerably dampened by the long milk yields of native animals.

Consequently, a corollary strategy had to be introduced; distribution of dairy-type animals. Three animal distribution schemes have been adopted:

- *Dispersal.* The BAI follows this scheme, whereby dairy animals are distributed to selected farmers. Ownership of the animal transfers to the farmer once he has "paid" back one head of heifer, which was produced by the originally dispersed cow.

Reportedly some 2000 heads of dairy animals have been distributed by the BAI under this scheme.

- *Credit-Financing.* DTRI initiated this scheme in 1978, when a program to import (108) dairy animals and raise them on commercial farms was implemented. The DBP financed the animals and dairy infrastructures. The full value of the animals, buildings and facilities were considered as loan to be paid plus the normal banking charges.

KKK, in 1981-82, similarly provided animals (158 heads) under this arrangement through the Land Bank of the Philippines. The imported animals distributed by the PDC were also (initially) under these terms.

- *Modified "paiwi"*. This system, recently adopted by the PDC, builds upon the traditional "paiwi" system where a livestock owner assigns an animal to a farmer for him to manage; the benefits e.g. milk, calves, meat are "shared" by the livestock owner and the livestock raisers under terms mutually agreed on. Generally, sharing is on a 50-50 basis.

Over-all, PDC had distributed close to 3000 heads of dairy animals under credit and "paiwi" arrangements.

2. *Provision of technical services*. Veterinary and breeding services normally go with the package. The veterinarian is to safeguard health and treat diseases. The AI technician is to upgrade the native stock and maintain the blood line of dairy animals. In certain cases, dairy bulls are also distributed – a concession perhaps that bulls are more effective in certain cases.

Provision of planting materials of improved forages is also a part of this service.

3. *Extension-education*. Usually, this consists of farmers' meeting, teaching farmers milking techniques and methods of improved feeding and management. Some training is also provided; in the main, 3-5 days, seminar-type courses for farmers who participate in the scheme. Some media is also used: radio, leaflets, brochures.

Field technicians are normally hired to do these things.

4. *Farmers' organizations*. In almost all cases, the farmers are organized. Apparently, each of the government agency has its own bias as to the form of social organization.

The MAF-BAI had always favored farmers associations. The UPLB-DTRI, in 1970, formed dairy cooperatives; by 1973 and henceforth its farmer-clients were never organized formally.

The KKK formed Samahang Kabuhayan(s), a barangay-based, pre-corporation unit. The PDC formed pre-cooperatives, along the Samahang Nayon lines, for eventual formation as primary and federated cooperatives.

What is also noteworthy about these organizations is that in most cases, membership in the organization is a prerequisite to being given dairy animals.

C. *Private Sector Initiatives in Dairy Extension*

At least two private groups have ventured directly into dairy extension work: Magnolia and Carnation.

Magnolia, sometime in 1975, distributed dairy animals to a barangay near their farm in Cavite, provided technical and information services and collected the

milk produced by these animals. For reasons discussed by Mr. Acabado earlier, this program was discontinued.

Carnation Philippines launched its BAKAUNLARAN program in Sariaya, Quezon sometime in late 1970's and carried it through up to the early 1980's. The scheme was on an "Upgrade now, milk later" plan. Hence, the initial activities were on upgrading of the native stock using Holstein-Friesian semen. When the female offspring (50% Holstein-50% Native) were ready for milking, a milk collection operation was instituted.

This program succeeded in producing significant number of grade animals; developed pastures/forage areas under coconuts, trained farmers, and produced milk sold directly to consumers or brought to DTRI.

It is reported that this program was turned over to the MAF-BAI sometime in 1984-85.

NESTLÉ Philippines was also reportedly interested in exploring possibilities for coming up with a dairy program in Northern Mindanao based on smallholder farmers. Nothing is definite, however, about this.

An international agency, Heifer Project International, through the Philippine Rural Life Center based in Cavite, had been, through the years, providing imported dairy type animals to farmers either through the MAF-BAI, UPLB-DTRI and other agencies.

D. *Some Notes on the Extension Programs*

The above discussions illustrate certain salient features about these schemes. Among these are:

1. *Volume increases are not significant.* In spite the early start in this direction, not much headway had been reached with respect to substantially increasing the volumes of milk collected.

The Sorsogon project, the first ever organized in the country, was already collecting a high of 350 liters/day in 1964-65; as of 1986, the same level of collection applies.

The UPLB-DTRI Plant used to have a throughout of 1.2 tons/day in 1979. At present, its volume of milk processed is just about the same.

The same pattern of almost the same, or even reduced volumes of milk, seems to apply in other milk collection schemes.

2. *The bias on production.* The slow growth in volume produced and collected had been attributed to the inability to effectively market the milk. Yet the "technology package" for dairy extension continue to emphasize production processing and marketing extension services seem to have been less emphasized.

3. *The technical dimensions.* In this respect, three points need to be discussed.

- *The farmer, his knowledge and resources and the animals.* Dairy-type animals require special care and attention, extra feeds and affection. Such requirements may be beyond the know-how and the resources of the smallholder farmer to provide.

The question is to what extent and how should the animals "fit" with the knowledge and resources of the farmers. Experience indicates that a very great degree of selection has to be applied with respect to who should and who can effectively manage dairy animals.

- *The product and the production environment.* Milk is one product that requires the strictest standards of hygiene and easily spoils if improperly handled. Yet, its production is based on a rural environment, which is not really conducive to strict sanitation. Milking methods and the milking requirements of clean and sanitary pails, clean cow and teats, clean milking areas need improvement. In spite of the long years of extension, education, much remains to be done in this respect.

- *The product and the collection/processing systems.* A guidepost in preserving milk quality is to shorten the lead time between production and processing. Unfortunately, this is hardly possible in a milk collection system. Under the KKK scheme, for example, the farthest production points is some 3-4 hours away from the processing plant, via the normal collection schedule.

4. *The financial aspects.* Basically, one talks of cash inputs and outputs here. In smallholder production systems, the major cash cost is for the animals. The animals distributed by the PDC cost about ₱25,000/head. It would certainly take record levels of production and numbers of lactation for a farmer to be able to amortize this loan and still keep some income to make dairying attractive to him.

Furthermore, the recommended inputs – if really provided – to realize expected production level exhibits continuing increases in price. Spent grains, until five years ago was given away free by breweries, then initially sold at ₱0.05/kg. Now it sells at ₱0.27/kg.

On the other hand, the price of milk until 1984 had not increased significantly. In 1985, a major increase (from ₱4.50-₱5.25) was effected mainly because PDC upped its purchase price from farmers to this level.

A related issue is that of the farmer in the context of his farming systems. Among smallholder farmers, no one is a full-time dairy farmer; everyone is a part-time dairyman. Whether the time and resources devoted by the farmer is compensated for by the incomes and additional benefits derived from the dairy involvements has to be assessed. Or what size farm holdings is optimal considering the differing resources of smallholder farmers.

Whether the price and cost structures will ensure viability of the smallholder farmer is an issue to be addressed. Additionally, whether milk collec-

tion schemes can be financially viable under an arrangement whereas milk price is high, volumes collected are low and collection costs are high must also be considered.

6. *Socio-political aspects.* A key feature of the scheme is that it had fostered and continue to foster dependence by farmers on government, under a set-up where government subsidizes operations. The farmers produce; government collects and markets.

There have been attempts to have farmers' organizations assume roles beyond production. So far, there has been no success.

The issue is to what extent farmers, through their own organization, should involve themselves in matters beyond merely milking of cows. This has implications with respect to the self-reliance goal of development and the need to reduce subsidy for government's development operations. Can not the farmers, duly organized, properly oriented, technically skilled take over the operations and management of milk collection scheme?

A related issue, raised earlier by Dean Umali is that of farmers' representation in policies and programs directly affecting their lives. To what extent is this concept operationalized among the participants of government extension programs?

Training Programs

Training is logically a component of extension, but is being discussed separately in this paper because of its central importance in effecting change.

E. *Some Features of Training Programs*

Training is of course basically oriented to provide the manpower needs of the industry. The key question is: What does the industry really consist of? Otherwise, we cannot really provide the necessary manpower.

1. *Built-in with extension programs.* Again, as with extension, training programs are done mainly by government agencies. Another feature is that many of them are built-in with or are components of extension programs. Quite often also, training is provided before or as pre-requisites to receiving dairy animals under dispersal/credit terms. This is true with the PDC, the KKK and the BAI.

There is training also for Field Technicians and AI technicians. Normally, there is pre-service training or training before actual field assignments. Field technicians' training is done by many agencies e.g. DTRI, MAF-BAI, MAF-PDC. Training of AI technicians is a specialized course handled by the National Artificial Breeding Center.

Another government agency is the Philippine Training Centers for Rural Development. PTCRD provides training to MAF technicians on extension and social technology.

2. *Specialized Training Courses.* In this respect, DTRI assures the lead. There is at DTRI, now, a listing of a variety of training courses, numbering about 25, ranging from 1-day-30-day courses on production and processing technologies.

Annually, more than 200 clients are trained. Two "On Hand" training programs are noteworthy. A 20-day course for Dairy-Farm Hands and also a 20-day course on Dairy Plant Operations. Both are skills-and practice-oriented and are designed to produce farm and plant technicians. What is ironic (but not unwelcome) is the fact that the participants to these courses have their eyes trained on Middle East jobs, not the local industry. And a substantial number of them have really been recruited to work in "Saudi."

Over-all, DTRI training clients cover the range/farm and plant lands, technicians, farmers, housewives, youth, etc.

The Technology Resource Center of the Ministry of Human Settlements periodically comes up with training courses on specific areas: Goat production; Dairy Products Processing, etc.

F. *Some Notes on the Training Programs*

Cursory observations of training programs now in place would indicate the following:

1. *A heavy production bias.* Most courses are oriented towards production technologies; some on processing; none on marketing. The dominance of production-based training courses is logical since this is the focus of the extension or dairy development agencies. And more producers are needed. However, the corresponding training on products manufacture and even more so, the absence of training on marketing indicates an imbalance of the system.

Training for processors at DTRI are either for housewives for home-based manufacture or for Plant operators, operating in DTRI-Plant-like facility. No provision is made for medium scale entrepreneurs; for that matter, for processors of milk collected under milk collection systems. The latter is critical inasmuch as it is the development strategy espoused. Yet no training (and facility) is really oriented for the manufacture of products from milk of "low" quality and low volumes.

Exactly what training inputs could help resolve the marketing problems is difficult to quantify. But recognizing that there is indeed a marketing problem, and qualified manpower is needed to solve the problem indicate possible training directions.

2. *Lack of continuing training.* There is an obvious lack of continuing training. Farmers are trained *before* receiving the animals. Afterwards, hardly any training is provided. Technicians are trained *before* deployment; hardly any training is provided while in-service.

3. *Lack of skills-oriented training.* Farmers who go through a 3 to 5-day seminar-type training can hardly be expected to develop the skills required for proper management of dairy cows. On-farm or on-hand training, as pointed out, have been limited mainly to trainees whose main targets were jobs abroad.

Even Field Technicians seemingly lack the skills to effectively practice what they preach. Skills like proper milking, handling of cows, treatment of rice straw, planting of forage grasses, first-aid of sick animals seemingly are not developed in training courses provided to the technicians.

4. *Absence of management training.* While there is a lack of skills-oriented training there is also a lack of training for managers. Or for people who could look at the enterprise in an integrated and continuing fashion: from production, through collection and processing and marketing/distribution. Producers are trained; plant operators are trained, technicians are trained. There is no training for people who will oversee the project of the enterprise in its totality.

There are dairy management courses available through international grants. And there is no shortage of international training grants. But the degree by which such overseas training will be applicable to local conditions is an open question.

5. *A "mismatch" in training.* Perhaps there is a mismatch between the demand and the supply for trained dairy manpower.

An observation made by an Australian Consulting Group, which prepared the feasibility study for the ADB-IFAD Smallholder Livestock Project, was that hardly anybody in the labor force of the industrial milk plants were trained by DTRI. This was in 1979. Irrespective of whether the observation was true then or is true now or was/is false, is worth looking into.

If the current industry is the industrial milk plants, what training provisions are made to supply the demand for trained manpower of this sector?

Still another area of possible mismatch is the long list of manpower trained abroad. FAO Colombo Plan, UNDP, Denmark, Switzerland, New Zealand, etc. provide training courses. A substantial number of Filipinos have trained under these courses. A relevant question perhaps is "where are they now?"

In effect, while there is apparently no shortage of trained manpower based on reports of training programs, local and abroad, the glaring need for qualified man-power, however, negates such a pat and easy conclusion.

Concluding Statements

What we did in this paper was to present an overview and raise some issues about training and extension programs. Some generalizations may appear sweeping; some details may be missing. But the idea is to provide some inputs – based on impressions and experience – to the workshop groups this afternoon. Hopefully, we shall have provided some useful guidelines for the workshop groups to work on.

EXPERIENCES IN ADVANCED BREEDING TECHNOLOGY

Joseph S. Serus, Jr.
President, Philippine Genetics Inc.

(Delivered by Mr. Gerry Ledesma)

Introduction

The Philippine imports about 99% of its total milk product requirements. Estimates have shown that as of 1983, the Philippine population had a demand of 959 million liters of milk and dairy products, while we locally produced only 10 million liters of milk and dairy products.

The devaluation of the peso has made local milk production more competitive with imported milk. In terms of requirement the country would need a milking herd of about 175 thousand cows for the Philippines to attain self-sufficiency in milk and dairy products.

That is a long way off. The dairy industry is young and its growth shall be dependent on the development of technology in the Philippines. Among such technology is the embryo-transfer technology for which Philippine Genetics, Inc. has pioneered in.

Objectives of PGI

- a. Hasten the development of the livestock industry material using artificial breeding techniques;
- b. Increase the income of livestock raisers through increased market value of livestock offspring produced;
- c. Save and earn foreign exchange for locally produced frozen semen/embryos.
- d. Increase supply of livestock and livestock products available for human consumption.

With these objectives in mind, PGI aims to be of assistance to the dairy industry with embryo transfer. This technology, when adopted is expected to provide the following advantages and benefits.

- a. The technique provides a short cut method for the supply of purebred dairy breeds adaptable to Philippine conditions within a generation of the cattle cycle by implanting purebred dairy embryos into recipient mothers.
- b. The embryo transfer technique enables the dairyman to have a herd

with less variation in the consistency of production performance by extraction of multiple embryos from the eggs to producing lines. For beef breeds, it makes possible the production of lines and families consistently producing calves with better feed conversion performances. It also enhances homozygosity of the herd with less variations in transmitted traits.

- c. Progeny from livestock possessing desirable characteristics (i.e. tick resistance, disease-resistance, tolerance to heat and good adaptability to harsh environmental conditions) may be replicated easily thru superovulation giving as much as 56 viable embryos per flushing from the donor cow.

The adaptation of the embryo transfer technique in the Philippines will eliminate the fear of introducing foreign infections into a herd, which is possible when mature animals are purchased. Offspring that are born and raised within the herd with possible natural immunities to all organisms present within the herd, having inherited these immunities from their recipient mothers.

Opportunities

1. *Herd Improvement*

The potential of embryo transfer vis a vis artificial insemination is enormous. Through AI an outstanding female cow produces only one offspring per year and about 10 in her lifetime. Utilizing the techniques of super ovulation and embryo transfer, that same female can produce about 20 offspring in a year. With each offspring capable of producing 20 per year beginning at two years of age.

For dairy this would mean the maximization of milk production in 24 years time by having a homozygous herd with less production variations. Similar results would also redound to beef cattle in upgrading their genetic superiority.

2. *Progeny Testing*

The use of progeny testing in determining the performance of a sire and dam through its progeny can be determined in one generation. Through superovulation and embryo transfer a line can be treated by extracting 20 embryos within a year's time, implanting them a recipients and observing undesirable variations among the batch produced within that year since the births and growths of the calves produced can be observed at the same time.

In beef breeds, better ADG's can be produced from the progeny of a top producing cow by upgrading the herd thru the technique. With better feed to weight conversions animals would be able to reach higher

weights in lesser time needing less animals slaughtered to achieve a fixed total requirement. Take a theoretical example:

If we need 250,000 kgs. we slaughter at an

<i>LW</i>	<i>Weight Recovery</i>	<i>DW</i>	<i>Requirement</i>
260 x	.50%	130	1923 heads
300 x	.50%	150	1666 heads
350 x	.50%	175	1428 heads
400 x	.50%	200	1250 heads

Experiences of PGI

The opportunities are enormous. During the years since PGI has started, the application of embryo transfer requires precision and exactness – from the selection of the recipient herd to the implantation of embryos to the birth of the E.T. calves and raising them as potential donors.

Recipient Selection and Maintenance

In the selection of the recipient herd, not just any type of animal will do. A recipient must possess proven mothering and milking ability. It must be capable of carrying and giving birth to animals having high birth weights. It must be conditioned to its peak breeding ability prior to receiving the embryo. Heats and estrus cycles have to be monitored closely as this is where breeding records and estrus cycles by the source would have made herd selection operations more efficient. Proper nutrition and animal health practices must be exercised on the herd creating a condition where the recipient is ready to accept the embryo and provide for its nourishment till birth. Regular monitoring of the condition of the ovaries are important as a requirement in the degree by which it can accept the embryo.

Implantation Operations

Time of implantation is also exact. The selection and rejection process of recipients even continues up to the day of implantation. Embryos are likewise selected for implantation conforming to the standards of a highly viable embryo for implantation to the recipient.

Intensive care is required for caring the pregnant recipient herd while preparations are made for the birth of the calves to meet requirements and contingencies which may arise.

For the calves, management, nutrition and health are passed thru strict standards to exhibit their maximum genetic potential.

All these would pay off through savings taken from adopting efficient and effective systems for greater productivity per unit cost. The end run of it would be to make available the embryo transfer technique at lower costs to the livestock industry.

To assess our present industry, the opportunities for development are tremendous. With the use of advanced breeding techniques, the realization of a developed livestock industry comes nearer within our grasp.

CREDIT PROGRAM FOR DAIRY FARMERS

Pedrito T. Rabonza

*Officer-In-Charge, Livestock and Poultry Group
Agricultural Supervision Report, DBP, Makati, Metro Manila*

Introduction

Pursuing a credit program for dairy production is in line with the goal of the government to attain self-sufficiency of milk and improving the quality of life of the people. The Development Bank of the Philippines (DBP) is one of the agencies of the government entrusted to carry out this objective through its credit facilities.

In the performance of its function of extending medium and long term credit to deserving dairy projects the DBP is following certain basic guidelines. First and foremost is that the proposed project is bankable, meaning the project meets certain guidelines of the bank like suitability of the project site, credit capacity of the prospective applicant, technical knowledge, management know-how of the applicant, availability of required inputs and sufficiency of collaterals. Second, the proposed project must be viable. It is because of these guidelines that the Bank spends time and effort in evaluating any proposal for dairy project. Viability means that the project can repay the obligation out of the income generated by the project. It is in this aspect where misunderstanding between the bank and the borrower develops. "While it is true that the DBP is mandated by law to support government programs, it being a government-owned corporation, it does not grant loans to anyone indiscriminately or to finance any project without thorough study (Songco: Credit Facilities and Financing Programs of the DBP for Livestock and Poultry)". These are basic guidelines designed as protective measures to safeguard both the interests of the bank and the borrower.

Features of DBP Loans

There are certain features of the loans granted by the bank for dairy projects which include the following:

1. Counselling and technical assistance by competent bank personnel in collaboration with specialists from other government agencies;
2. The amount of credit provides for expenses to be incurred during the early or unproductive stage of operations;
3. The term of repayment is on a long-term basis and geared to expectations of income;

4. Loan payments are deferred and fall due only when the projects begin to earn income; and
5. Regular supervision to assure that loan funds are properly used and that loan payments are up-to-date.

(Excerpts from Manager Songco's paper on Credit Facilities)

Program Implementation

To supplement its own resources, the DBP has sought the assistance of the World Bank in the implementation of its program for the financing of cattle, poultry and swine projects.

The first World Bank loan of U.S. \$7.5 million signed in May 1972 was to provide financing of some 1,450 small and medium size piggery, poultry and integrated coconut/beef cattle farms, 25 hill beef cattle breeding ranches, three slaughterhouses and for technical services. The loan was fully disbursed by September, 1976, some two years ahead of schedule.

The second Livestock loan obtained from the World Bank provided funds for the establishment of 2,950 piggery, poultry, coconut/beef and hill-beef farms. Funds were also provided for ten municipal slaughterhouses (also authorized under the first loan but never taken up due to general financial constraints of the municipalities), and research and development of a feed quality control program by the Bureau of Animal Industry. All the funds for on-lending by DBP to livestock/poultry producers were fully disbursed in June 1981, a full year ahead of schedule.

The third Livestock loan (this time combined with fisheries development) in the amount of US\$45 million was signed in August 1980. "This project would cover a period of three years, support the Government policy of increasing animal protein supply by providing medium and long-term credit to livestock (and fisheries) producers and by strengthening the institutional capabilities for planning and implementing this and similar programs". (Excerpts from Manager Songco's Paper on Credit Facilities of the DBP). The loan's closing date was June 1984. It has un-availed balance of U.S.\$923,479.41 as of March 31, 1986 net of the amount of U.S.\$20,441.19 cancelled. The DBP suspended lending operations in August, 1982 due to financial problems.

To give you a bird's eye view how the credit lines from the World Bank were utilized the following data are hereby presented:

First Livestock Loan (\$7,500,000.00)

<i>Loan Releases</i>	Number	Amount
Riggery	2,100	₱72,959,948.60
Poultry	362	20,136,246.00
Backyard Cattle	17	1,681,899.00
Coco Beef	73	3,465,219.00
Hill-Beef	21	1,293,364.00
TOTAL	2,691	₱99,530,267.60
Equipment		51,444.29
		₱99,582,311.89

Conversion Rate: \$1: ₱7.21

Second Livestock Loan (\$20,116,567.90)

<i>Loan Releases:</i>	Number	Amount
Piggery	5,598	₱201,545,104.00
Poultry	2,023	88,267,379.00
Dairy Cattle	29	2,644,084.00
Backyard Cattle	164	5,703,927.00
Cocobeef	241	10,232,165.00
Hillbeef	255	20,267,196.00
Slaughterhouse	1	800,000.00
TOTAL		₱327,459,846.00
Others: Training outside the Philippines		20,000.00
		₱327,479,846.00

Conversion Rate: \$1: ₱7.44

Third Livestock/Fisheries Credit Project (\$21,757,326)

<i>Less Releases:</i>	Number	Amount
<i>Livestock:</i>	942	₱163,210,646.00
Broiler	353	56,682,343.00
Layer	221	24,509,626.00
Backyard Cattle	1,006	31,950,300.00
Dairy Cattle	2	4,609,335.00
Cocobeef	243	9,910,849.00
Hillbeef	484	21,836,485.00
Goat	87	2,738,995.00
Duck	23	2,805,715.00
Slaughterhouse	1	287,000.00
Quail	3	181,500.00
Sub-Total	2,965	₱318,722,874.00

<i>Fisheries</i>		
Fishpond	687	₱124,153,471.33
Deep-sea	69	15,989,998.92
Saltbed	2	545,226.00
Ice Plant	2	1,185,520.05
Lambaklad	1	455,000.00
Slipway	4	799,900.00
Sub-Total	765	₱143,129,116.30
Consultancy Services (including computerization project)		40,490,321.64
		<u>₱502,342,311.94</u>

Conversion Rate: \$1: ₱20.00

From the above data, it can be observed that the amount disbursed for dairy projects is very negligible (₱7,253,419) compared to the amount disbursed to other sub-sectors of the industry like the piggery and poultry projects. The low cash outlay for dairy projects may be attributed to the very few number of applicants for this kind of enterprise. Way back in 1979, a Food and Agriculture Organization (FAO) Mission listed the following major constraints on the development of dairying in the Philippines as follows:

- a) Climate: high yielding temperate miling breeds cannot adapt to the humid tropical climate without serious reduction in yield;
- b) Breeds: the absence of significant numbers of dairy type animals;
- c) Forage and Supplementation: economic yields cannot be contained on tropical pastures and meal supplementation is necessary;
- d) Tradition: There is little or no tradition of fresh milk production or consumption in the Philippines. Any dairy development must be accompanied by intensive technical services for producers and education for consumers;
- e) Milk processing: the absence, except in a few areas close to Manila of any comprehensive milk collection, reception, processing and marketing facilities will prejudice the outcome of pioneer dairy producers; and
- f) Price: unless domestic production is directly subsidized by price support or imported milk powder faces a tariff, the market price will be insufficient for commercial scale local production to be profitable.

While the above issues raised by the FAO Mission cannot be discounted, we believe it is the avowed policy of the state that the dairy industry must be developed at all cost. If we cannot start now, there can be no dairy industry even for future years to come. In reply to the position of the FAO Mission, we reproduced the analysis and observation of the DTRI on the UPLB-DBP Dairy Financing Scheme (DTRI Annual Report, 1978). "This project was initiated in 1977, jointly by the Institute, the Development Bank of the Philippines, the Bureau of Animal Industry and the U.P. College of Veterinary Medicine. Through dairy loans granted

by DBP, commercial dairy farms in Batangas and Quezon, stocked with Holsteins imported from Australia, were established.”

In 1978, a significant portion of the Insitute's time and resources were occupied by this project. Technical supervision, regular veterinary visits and dairy milk collection were some of the major tasks of DTRI.

Production levels were higher than expected. The feasibility study projected 8 kilograms over 300 lactation days. Actual production between October 1, 1977 and September 30, 1978 showed an average of 8.20 kg. over a 257-day lactation period. Production range was a low 7.00 kg. over 200 lactation days and a high 11.24 kg. over 238 days. Total production between October 1, 1977 and September 30, 1978 was 217,374 kgs. of milk.

Enthusiasm for the project remained high. Four out of 10 cooperators have plans of increasing their imported stocks. In addition, there are six others who have indicated willingness to import Holsteins, bringing the total number needed to more than 230 heads. But decision on this regard is pending. The consideration is the draft Dairy Bill which will have repercussion on animal and milk pricing later on. This includes the approval of the move by the Director of Animal Industry and Ministry of Agriculture.

There are of course problems. These are particularly in the areas of health and reproduction. From the original number of 114 distributed in 10 farms (one died while in transit from the international airport to Lamot, Calauan, Laguna), two have died; a total of 56 calves were delivered within the years”.

The approach is, in a way, a new one. It explores an alternative to development through upgrading of native animal stock. It brings in already certified dairy breed animals. The long lead time required in upgrading therefore, is shortened considerably. There are of course, oppositionists to the approach. What could not be argued, however, is that the scheme *did* generate additional resources for dairy; showed the willingness of private entrepreneurs to go into dairying; proved the interest of a government bank to finance dairy business and of a University unit to spearhead and support the approach continuously. These factors bode well for the over-all efforts towards the development of the local dairy industry. (Source: 15h DTRI Annual Report).

DBP Requirements

Hereunder are presented in simple but detailed terms the mechanics of and requirements for the livestock and poultry loans made available by DBP.

Qualified Borrowers:

High priority shall be given to those who have wide experience in animal husbandry and are actually in the business of raising pigs, poultry and/or

cattle. Second preference will be given to applicants not yet in the business but who show the proper aptitude and utility for undertaking a particular livestock enterprise and who have in their employ a full-time experienced animal husbandman, veterinarian and/or caretaker.

Allowable Loan Purposes:

Purposes for which loan funds may be used shall include:

1. Construction of farm buildings essential to the projects;
 2. Purchase of stock;
 3. Purchase of feeds, supplements and vaccines;
 4. Installation and/or improvement of water system;
 5. Construction or installation of fence(s);
 6. Acquisition of machinery and equipment;
 7. Other purposes that contribute directly to increased productivity.
- In the case of cattle loans, development or improvement of improved pasture, etc. is allowed.

Collateral Requirements:

Generally loans shall be secured by real estate properties, including existing and proposed improvements and installations. Chattel mortgage on machinery and equipment and livestock (in special cases like cattle for breeding purposes) is also acceptable as loan collateral.

Amount of Loan:

The amount of loan shall be based on the actual needs of the project as determined by the investment plan and loan budget but subject to the income and repayment capacity of the project financed and the loanable value of acceptable collateral.

Releases of Loan Funds:

Loan funds shall be released in partial amounts, depending upon the time and amount of actual needs, which shall be in accordance with the investment plan and loan budget to be jointly prepared and studied by the borrower and DBP representative(s).

Equity Contribution:

In the implementation of the Third World Bank Livestock assisted projects the following were the minimum equity required by the Bank to be contributed by the borrowers as part of the total project cost:

Type of Sub-project	Unit	10%	15%	20%	25%
Small Livestock:					
Piggeries	Breeding Sows	Up to 20	21-49	41-70	over 70
Layers	Bird	Up to 2,000	2002 – 5,000	5001 – 10,000	over 10,000
Broilers	Bird	Up to 4,000	4,001 – 10,000	10,001 – 15,000	over 15,000
Cattle:					
Village		all loans			
Hills	Breeding cows	Up to 150	over 150		
Cocobeef and others		all loans			

Repayment Terms:

Terms of repayment will be based mainly on the ability of the borrower to service the sub-loans from the income generated by the project. Normally, they will not exceed the following:

Type of Sub-project	Max. Grace Period	Years	Max. repayment Period incl. grace
A. Small Livestock			
1. Piggery	2		12
2. Layer	2		10
3. Broiler	1		8
B. Cattle			
1. Village	5		15
2. Hills	5		15
3. Cocobeef & Others	5		15

Interest Rates:

All loans granted by the Bank are charged 7% over the borrowing cost which is at present pegged at 26%. Under the DBP-SSS Financing Program for Small Scale Enterprise, the interest rate is 17%.

Technical Assistance

Under its supervised credit scheme the DBP conducts regular project supervision of financed projects beginning from the start of releases of loan funds to full loan repayment.

However, due to lack of personnel, project supervision cannot be fully implemented. In its desire to improve standard of supervision and monitoring of livestock and poultry projects, the Bank has requested the Bureau of Animal Industry (BAI) for secondment of livestock technicians. These technicians while on detail with the Bank, shall spend their time working in the field to assist and upgrade the technical knowledge of poultry and livestock raisers. A minimum of once a month follow-up visit may be required for projects when technical knowledge is felt inadequate. The frequency of visits may be reduced depending on the improvement attained as reflected in the improved production and management. These technicians shall assist the Bank in establishing macrolevel policy and framework in order to strengthen the capabilities of the Bank in matters pertaining to:

- a) project identification, preparation and implementation based on sound technico-economic parameters;
- b) extend technical assistance to DBP-staff and borrowers;
- c) to supervise finance projects; and
- d) monitor and evaluate on a continuing new and/or improve existing ones.

These technical services are being rendered at no cost to DBP borrowers. At our end these technicians have contributed greatly to the improvement of the management of DBP-financed livestock and poultry projects. Further, through constant monitoring of the activities of the project, DBP has evolved broad guidelines to further strengthen our operations.

Prospects of the Dairy Industry

While the infant dairy industry has some problems to hurdle particularly in the fields of management, health, reproduction and marketing, it is our hope that somehow an approach will evolve that is workable and acceptable. Workable in the sense that it is both bankable and viable. A syndicated exchange of information, data and other related factors among research agencies, dairy farmers and financial institutions is needed to deal with these concerns. An area-based approach may also prove to be effective in meeting the credit requirements of backyard farms, some of which can only be made economically and financially viable through integration of farm activities. Technology transfer from the extension workers and credit facilities from the lending institutions are needed to arrive at a workable and sound dairy program. However, the most crucial ingredient of any successful dairy program is the total dedication and commitment of all the people involved in the endeavor. Perhaps after a continuous soul-searching effort of all concerned people, the infant dairy industry might evolve from its present sluggish growth to a progressive and successful program. These issues are being addressed to the academe, the farmers and the lending institutions.

“The demand for milk is very limited and up to now has been a high income urban consumer item. With the availability of milk at village level, and the necessary nutrition extension, rural consumption will grow. As saleable milk under this project is considered incidental to on-farm production, the currently limited milk markets and the very limited fresh milk distribution network are not considered limiting factors in this project” (World Bank Appraisal Report pp. 45, 1980).

Summary and Conclusion

The infant dairy industry must be developed at all cost. This is the concern of the academe, the farmers and the lending institutions. Without the concerted efforts of all those concerned, a successful dairy program is not possible within the next few years.

Moreover, a successful and progressive dairy program needs the total dedication and commitment of the people involved in the endeavor.

DAIRY INDUSTRY AND DAIRY COOPERATIVES IN INDIA

By

Honorable Krishnam Raghunata

(Delivered by Katar Singh).

Dairy development occupies a crucial place in the scheme of agricultural and rural development in view of its immense potential to benefit the rural poor, especially small and marginal farmers and landless agricultural laborers. A well conceived and executed dairy development project can act as a catalyst of rural development particularly in India as the main thrust is not through organized big herds of mulch cattle like most of the developed countries but an additional income generating supplementary activity for millions of farmers whose main occupation is agriculture. In Operation Flood, the National Dairy Development Project being implemented since 1970, the emphasis has been on organization of village level cooperatives and district level cooperative unions of milk producers and organizing the supply of necessary inputs and processing and marketing facilities.

Planned dairying on a national scale was introduced in the First 5-Year Plan in 1951. But for want of specific financial provision for dairy development in the plan, only two major schemes for organizing the supply of milk to Bombay and Calcutta, respectively, were taken up. This initial step, however, paved the way for perspective planning in the subsequent plans.

One of the constraints on increasing the production of milk at the start of the First Plan in 1951 was the poor facilities for marketing. This deficiency was felt most in the villages, where for want of speedy transport to urban consuming centers and marketing arrangements milk was largely converted into ghee (clarified butter).

Marketing schemes were drawn up under the Plan to supply fresh milk regularly to the main urban centres from the surrounding countryside, and despite many obstacles most states progressed rapidly in this direction and large dairies were set up to link producers with processing units in the cities.

Some large dairies built a chain of chilling centers to collect and chill milk for transport to city units, and those processing centers provided a big stimulus to the dairy industry throughout the country.

The first Operation Flood was launched on July 1, 1970 and was extended until June 30, 1979. One million milk producers in India's rural milksheds had joined the 1,000 village dairy cooperatives which are under the aegis of the first Operation Flood. These dairy cooperatives are managed by the producers themselves, enabling them to market their milk efficiently and avoiding the depredations of traditional middlemen, who had hitherto been able to monopolize most of the profits earned on milk in India. Under the first Operation Flood, dairy cooperatives were started in 18 of India's major rural milksheds. These dairy cooperatives were based on a model which had already proven itself to be successful before the first Operation Flood. This model cooperative's center was just outside a small rural town called Anand, and the model has thus come to be known as the "Anand Pattern of Dairy Cooperative".

Under the Anand Pattern, a rural cooperative infrastructure is built in the villages where milk producers live and keep their milch animals. In each participating village, the milk producers form their own village dairy cooperative, elect the Board of Management which sets the cooperative's policies, and instruct the Board to appoint a Secretary (a man from the village), who manages the Cooperative and who is paid out of the cooperative's earnings.

Every morning evening, the village cooperative buys milk from all producers in the village who wish to sell to it. The cooperative's staff (all of them from the village) measure the milk bought from each producer and test its fat content. Within 12 hours (usually when the producer returns to the cooperative to sell more milk), the cooperative pays for the milk sold earlier, and each payment is based on the tested fat content of that particular producer's own milk. This quality-based system of payment enables the cooperative to assure consumers of the quality of its milk products.

A key element in the Anand Pattern of Dairy Cooperative is that the village dairy cooperatives within a 50-75 km radius are all members of a Dairy Cooperative Union which enables them jointly to own a dairy processing factory. Each union organizes the collection of milk twice daily from all of its member-village cooperatives, whose milk is thus brought to the factory and pasteurized. Some of the milk is forwarded in insulated tankers to major cities to be consumed as liquid milk, while the balance (which is especially large in India's cool post-monsoon season) is processed into valuable products such as baby-food, cheese, etc.

Every dairy cooperative union (which typically processes and markets 100-500,000 liters of milk daily) has a board of directors which is elected by the producers themselves. This board in turn appoints a professional, high-caliber manager who is the union's chief executive. The union not only processes and markets the members' milk, it also produces and markets the technical inputs which the poor rural milk producers need in order to increase their milk production.

Thus, the Anand Pattern Dairy Cooperative Unions organize mobile veterinary clinics, artificial insemination centers, supplies of balanced cattle-feed concentrates, all of which are marketed to the producers on their doorstep, through their own village dairy cooperatives.

In a further development, the original model dairy cooperative union at Anand joined with five sister unions to form a Cooperative Milk Marketing Federation, which enabled all its member-unions to benefit from a shared marketing programme that is managed by skilled marketing specialists.

Thus, the Anand Pattern has evolved a "3-tier" structure of village dairy cooperatives, unions of village cooperatives, and federations of dairy cooperative unions, with elected representatives of the producers setting each institution's policies at the level of each "tier".

Operation Flood II had been designed to lay the foundation for a viable, modern and self-sustaining dairy industry in the country. It started operation in 21 States and 4 Union Territories (Goa, Andaman, Pondicherry and Mizoram). The major thrust of this project was to disperse dairy development activity and implement it through a three-tier cooperative structure. Thus, the producer became an active participant in the functioning of the various milk plants. 29,000 village milk producers' cooperatives were organized to cover and benefit 3.18 million farm families with an average rural milk procurement of 5.53 million liters per day. Further the World Bank-assisted integrated cattle-cum-dairy development projects were completed in the States of Rajasthan, Madhya Pradesh and Karnataka. Also three centrally sponsored dairy development projects were implemented in the districts of (i) Darrang, Dibrugarh and Sibsagar, (ii) Cachar (Assam), and (iii) Jammu and Kashmir so as to develop areas not covered by Operation Flood II project. To make available the trained technical manpower for implementing the various dairy projects, an Institute of Rural Management was set up at Anand during the Sixth Plan period.

Development of the National Milk Grid. Under Operation Flood I, regional milk grids were established to link the four major cities (Bombay, Calcutta, Delhi and Madras) to their major hinterland milksheds, in which the Anand Pattern Dairy Cooperatives were established under the programme. The purpose of the regional milk grids was to assure the rural milk producers of a year-round, stable market for their milk, while also stabilizing liquid-milk supplies to the major cities. Under Operation Flood II, the four regional milk grids were linked to form a national milk grid, connecting the 25 cluster federations to the 147 major cities of India. The federations supply liquid milk to these cities directly via economical manual bulk-vending systems. The grid has also been strengthened by the provision of storage facilities for a pooled buffer stock of dairy commodities for recombination into liquid milk, and by a number of insulated road-and-rail milk.

Infrastructural Supports to Cluster Federations. Economical mass-production of foot and mouth disease vaccine, and erection of national vaccine-delivery system have been undertaken by the Indian Dairy Corporation to ensure that animals

reared at the National Milch Herd are protected from foot and mouth disease. Action has also been taken to continue the process of improving the productivity of the National Milch Herd as a whole. Fourteen milch animal centers established under Operation Flood I have their herds increased to ensure adequate supply of proven bulls; a new buffalo productivity program has been established to produce proven buffalo bulls and buffalo holding farms have been set up to help make the marketing of live buffaloes more efficient. At the same time, the NDDB has established a new center for management and consultancy in cooperative rural development providing consultancy services to farmers' organizations while conducting programmes of management education for cadres of young managers to serve the farmers' cooperatives, including the cluster federations. Finally, to speed up the rate of practical innovation in the dairy industry as a whole, a new division of applied R & D has been established within the NDDB to undertake applied research in order to arrive at innovative, practical solutions to operating problems encountered in the field.

The size and complexity of Operation Flood II is such that the planned increases in milk supply and the ways in which these increases are deployed in order to satisfy demand could never be projected with full certainty. Therefore, although firm targets have been established, these targets have to be modified taking into account the changes actually found to be taking place, throughout the Operation, in milk supply and demand. To deal with these changes flexibly, milk supply and demand in the milksheds and the urban demand centers are monitored closely. Annual reviews are being undertaken with the cluster federations to ensure that milk production is kept in step with the build-up of milk processing and marketing facilities. It is anticipated that mid-course corrections will be needed to achieve the necessary balance between supply and demand.

Objectives, Approach & Strategy in the Seventh Plan (1985-90). The first objective is to provide the infrastructure necessary to achieve accelerated growth in livestock products. The second objective is to consolidate the gains achieved under the various programmes of animal husbandry during the Sixth Plan period. The third objective is to enable as large a section of the rural population as possible, including the small and marginal farmers, agricultural laborers, tribals and Girijans to improve their nutritional and economic status by providing them gainful and fuller employment through livestock rearing.

The programmes in the animal husbandry sector to achieve these objectives are as follows:

- (i) Cross-breeding of cattle with exotic dairy breeds;
- (ii) Continue intense breeding amongst cross-bred cattle using progeny tested bulls so as to ultimately establish breeds of cross-bred cattle suitable for different agro-climatic areas of the country;
- (iii) Development of indigenous breeds of cattle and buffaloes of both draught and dual purpose types;
- (iv) Improvement of buffaloes through selective breeding;

- (v) Strengthening/expansion of infrastructure of farms to make available good breeding material to meet the requirements of various livestock development programmes;
- (vi) Increasing availability of animal health facilities at doorstep of farmers to safeguard their livestock;
- (vii) Increasing production of quality fodder seeds and adopting mixed farming system as also suitable crop rotations to make available adequate fodder resources.

In order to increase milk production and to improve draught powers, the programmes for improvement of various breeds with respect to cows and buffaloes coupled with other essential and supporting inputs like production of high merited breeding bulls, adequate and scientific feeding, modern management practices, provision of livestock health facilities, etc. will continue to be implemented during the Seventh Plan period. Efforts will be made to bring at least 25 million cows under the cross-breeding programme.

The work on embryo transfer technology will be taken up for the first time in the Seventh Plan to bring quick improvement in the genetic structure of the animals. The programme of progeny testing of cross-bred bulls under field conditions would continue and be extended to all the States. Many high yielding animals, when not in milk, are often reported to be disposed of in the metropolitan cities and thus, their valuable germplasm is wasted. Measures would be taken to conserve such elite animals and their valuable progeny for continuous milk production purposes.

The role of cattle and buffaloes as draught animals has, of late, gained importance in view of the unprecedented hike in the prices of diesel and gasoline for farm operations and rural transport. In this context, the development of about 20 indigenous breeds of Indian cattle and buffaloes, which are well known for their milk production, draught capacity, sturdiness, heat tolerance and disease resistance, would be taken up during the Plan period.

Buffalo contributes more than 50% of the milk production and has established itself to be an important dairy animal in most parts of the country. Efforts will be made to select and multiply superior buffalo germplasm through establishment and strengthening of large buffalo breeding farms. Work on the establishment of the Buffalo Research Institute of Hissar has been initiated by the Indian Council for Agricultural Research. This Institute is likely to be completed in the Seventh Plan to conduct research and development on buffaloes for solving problems relating to production, reproduction and nutrition.

The extensive livestock production launched in our country cannot possibly succeed unless an efficient health service is also built up simultaneously. As a result of concerted efforts made so far in this direction, production losses have been reduced substantially. Incidence of diseases have been brought down; for example, in the case of rinderpest, from a level of 196 cases per lakh (100,000) bovine population in the mid fifties to about two cases per lakh (100,000) bovine population

now. Vaccinations against food and mouth disease are carried out by providing 50 per cent subsidy on the cost of vaccine to the weaker sections of the community. The incidence of other endemic diseases has also been reduced substantially. The number of veterinary hospitals and dispensaries which were about 14,700 in 1984-85 have increased to about 15,730 in 1985-86. Similarly, the number of veterinary first-aid centres including mobile dispensaries also rose from about 19,200 in 1984-85 to about 19,900 in 1985-86. Disease investigation services are now provided by 250 clinical/diagnostic laboratories and the 17 public sector units produced about 400 million doses of vaccine for combating major diseases of livestock and poultry.

The control of rinderpest and its ultimate eradication has been the basic objective of the programme from the very beginning. In order to achieve this objective, various strategies such as mass vaccination in the initial phase and its follow up thereafter including special drive in vulnerable areas to screen and protect the animals in transit were introduced successively. Apart from the continuation of these strategies as a normal course, a new strategy of surveillance and containment vaccination programme was introduced during the later half of the Fifth Five Year Plan period through which the endemic foci of infections are sought to be detected by detailed searches throughout the country. During 1984-85, about 60 million vaccinations were carried out.

The main objective of the programme for control of foot and mouth disease is to protect valuable high yielding indigenous cross-bred and exotic livestock, belonging to weaker sections of the society in the areas covered by the milk sheds of Intensive Cattle Development Projects, areas under the cross bred calf-rearing projects of small and marginal farmers/agricultural laborers. During 1984-85, about 6 million vaccinations were carried out.

A feasibility study for dairy development in the Philippines was prepared by an Indian delegation, led by Dr. V. Kurien, Chairman of the National Dairy Development Board (NDDB) of India in 1983. The delegation's visit, which took place in 1982, was funded by EEC. The report presented an excellent study and made concrete recommendations about possibilities of dairy development in the Philippines. This would mean savings of \$36 million and employment for 1,400,000 people. The report recommends organization of milk producers' cooperatives in select areas, followed by extension of the milk cooperatives in other areas followed by the third phase of expansion in both these areas specially earmarked for dairy development. The report plans organizing of cooperatives for small scale milk producers who wish to produce milk for their own consumption and for the market. These village level dairy cooperatives would help mainly milk procurement (marketing assistance) and also channel providing at local levels, technical inputs so as to help participating families to increase their milk production (by provision of artificial insemination, fodder cultivation, animal first aid, as well as supply of balanced cattlefeed concentrates). Part of the proposal was recommendation to the

Government of the Philippines to make arrangements to buy buffaloes from India and Pakistan as part of the Carabao breeding unit.

OPEN FORUM

The exchange of ideas among the participants during the open forum brought about the following points:

1. Dairy development must be viewed in a holistic or integrated development scheme rather than identifying single factors contributing to the success or failure of the dairy enterprise. The participants accepted the fact that success in dairying can not be achieved by putting emphasis on milk production alone. Other concerns has to be inputted like marketing, breeding, feeding, management, veterinary health care and other support systems. In this connection, the participants noted the success of Magnolia Dairy Farms. Mr. Ricardo Acabado pointed to the fact that the farm is adoptive of recent breakthroughs in research. As early as 1976, the farm had already been using a 50:50 Zebu:Holstein (Brahman breed) crosses and they practice rigid selective culling and selection. The cross proved better acclimatized to the tropical climate.
2. The participants also recognize the dairy development require inputs which cannot be sustained by small holder dairy farms. In this regard, D. L. Umali addressed an inquiry to Dr. Rabonza that it seems the lending rate policy of DBP is anti-farmer. The farmers are charged 26% as against 17% for the small scale industries. Dr. Rabonza clarified the point and said the rate of interest is dependent on the interest of the borrowed money DBP uses for lending. He added that since 1976, there are 426,000 loans to smallholder farmers as against a handful of the small scale industries negating that DBP is anti-farmer.
3. Along the same line, Gov. Juan Frivaldo addressed a question to the assembly on how much appropriation is allocated for BAI, DTRI or PDC. And how much of the ₱500M given to DBP in early 1986 would go to dairy development. To this, Dr. Aglibut of DTRI made a brief remarks on the funding of the Institute. "By virtue of RA 4041, an appropriation of ₱1M was earmarked for DTRI but such amount has never been released in full but reduced to about ₱600,000 per year. DTRI has the expertise, capabilities, manpower resources but unfortunately the Institute cannot make any headway because of inadequate research and development fund. DTRI is presently looking for external fund to support its development program." At this point Dr. Mary Ann Franco of LDC announced that the councils' savings of ₱1.4M will be primarily inputted to the Dairy Training and Research Institute. Also, part of the ₱1.2M from the LDC fund is also considered to support DTRI's program.

4. The conference also noted that dairy development would need both government and private sector support in research and development. In answer to Dr. C.L. Davide's inquiry, Dr. Pat Faylon of PCARRD said that DTRI is the National Research Center for Dairy but due to limited funds very few researches could be financed, hence a need to really look for outside source of funds.
5. Dr. A. Y. Robles pointed to the fact that DBP does not finance for stock purchases whereas it is the animals that the farmers need most. They would like to increase the number of their animals but there is no money for that purpose. It is highly suggested that DBP should re-assess its policy about giving priority to the buying of feed rather than the animals to be fed.
6. Prof. Ocampo of DTRI commented that it is not fair to look at financing independently of the other components of the industry. He said that "if we limit the failure of the first batch of dairy farmers who made a loan from DBP, we must look at financing only as one of the support systems as success or failure of an enterprise is contingent with many other requirements. The conference has to look at the problem of the dairy industry in relation to technological requirements of the industry itself.
7. Dr. D. L. Umali agreed with the group that "we should have more budgetary provision for the development of the dairy industry and a little more incentive or possible subsidy for its development. He recommends an experience during his time depicting the governments' perception on subsidy: "I still remember some three years ago, when I was on the same plane with Prime Minister Virata, I said, Minister Virata, why did you remove the fertilizer subsidy for rice farmers? He said, it is costing us ₱280M. I said, which is better, to subsidize our farmers and loss ₱280M or import rice at a cost of ₱1.2B subsidizing the foreign farmers. So, I always heard these problems of imported milk cost much less than the locally produced milk, but a certain incentive of subsidy should be done so that one day we develop the dairy industry and minimize the importations of billions of pesos and millions of dollars which is a drain to our foreign exchange reserve. So let's talk of ways the government could provide incentives or even subsidy for the development of the dairy industry."
8. Prof. P. O. Ocampo raised a question as regards available milk supply. From the period 1978-80 in contrast with the period from 1982-84, there is an alarming drop of almost 60%. NEDA participants commented that the drop is due to a decline on imported milk and milk products.
9. Mr. Rene Abad raised some questions on the comparative advantage of AI vs.ET. Mr. Ledesma of PGI pointed out that ET is being adopted to hasten/shorten the incorporation of dairy traits to our local stock to

serve as breeding base. Embryos are imported and transferred to recipient herd. These embryos come from the top of the line breeds from abroad. This scheme is much cheaper than importing a top of the line bull or cow. ET provides a short cut in improving our dairy genetic base. Within a year, one could get a pure bred bull or pure bred cow.

10. Dr. Davide of DTRI inquired as to where to address the recommendations of the workshop. Dr. Aglibut responded by saying "that is stated during the first workshop. We are expected to come up with recommendations/resolutions and suggestions which will be endorsed to the people concerned. All of these recommendations/resolutions as suggested and proposed by Dean Umali during our initial meetings would be forwarded or submitted to the Ministry of Agriculture and Food."

WORKSHOP RECOMMENDATION

PRODUCTION

The group agreed that the small farmers are the backbone of dairy development, hence, they should be given emphasis on dairy development program. The support systems/services would include

1. *Training*
 - a. production and processing
 - b. entrepreneurship (management, housing, etc.)
 - c. cooperative training
 - d. leadership training
 - e. develop habit of milk drinking among school children through inclusion of nutrition education with emphasis on milk in the curriculum from kindergarten throughout their elementary school years.
2. *Credit: Financing for the following:*
 - a. animals
 - b. infrastructure
 - c. equipment
 - d. subsistence
 - e. land rent
3. *Ruminant reproduction, other veterinary services and diagnostic center*
 - a. assistance in establishing a realistic price policy for milk and milk products
 - b. animal dispersal

- c. assistance in milk collection marketing
 - d. assistance in organizing the farmers
4. *Foreign aid assistance* – the success of the Anand experience was partly due to this support service
5. *Research* –
 Action research for development of the dairy industry

PROCESSING

Problems

- A. Quality of milk produced at the village level is usually poor; (causes/reasons refer to Workshop I output)
- B. Too much dependence on imported dairy processing equipment.
- C. Need for more products development.
- D. Lack of information dissemination and technology transfer.
- E. Local markets is being flooded with dumping-priced imported milk and products.

Recommendations

- A.
 - 1. Review/update existing milk product standards by a designated group.
 - 2. Develop low cost quality control methods that can be done in the farm.
 - 3. Create a body to do spot testing in the farm.
 - 4. Put up training programs for technicians and farmers in milk quality control.
 - 5. Intensify education campaign on the standard for milk and milk products quality, hygiene and sanitation, and proper processing.
 - 6. Create a monitoring group and develop appropriate referral system.
 - 7. Do research on pesticides residues, radiocative materials, heavy metals, and other toxicants in milk.
- B.
 - 1. Design and fabricate appropriate equipment and facilities through research linkage with NIST, inventors' society and other groups.
 - 2. Learn equipment designs from neighboring countries like India.
- C.
 - 1. Develop technologies for milk and milk products processing for:
 - a. household level – On cheese, butter flavor milk drinks
 – desserts confectionaries, etc.
 - b. village level
 - 2. Develop new low-cost milk-based products.
- D.
 - 1. Develop information education materials on above technologies, recipes, health and nutrition information, and develop household small-scale livelihood projects on milk product.

- E. 1. The government should have the political will to resist over-flooding local markets with imported milk and milk product.
2. Limit importations by requiring local processors to buy locally produced milk.

MARKETING

1. Interface with filled milk sector.
2. Intensify information drive.
3. Strengthen marketing strategies to include:
 - a. Review of existing product lines and identification of potential or new products
 - b. Transformation of these products into acceptable forms/packaging
 - c. Expansion of market base to include immediate and provincial centers and provision of technical support
 - d. Strong government support to dairy marketing
4. Provide credit facilities for small scale processor/marketers
5. Development of an efficient Management Information System(MIS)
6. Phasing out government involvement in business operation and turn-over of the same to the farmers.

CLOSING REMARKS

Perfecto K. Guerrero

President, National Research Council of the Philippines

Today's presentation has been quite an eye-opener for me regarding our dairy industry. I think because of the numerous brands of milk and other dairy by-product available in the market and the abundance of supply, we have not given much thought to the problems that deter the growth and development of our dairy industry.

I would like, therefore, to congratulate the Dairy Training Research Institute of UPLB-College of Agriculture and the National Academy of Science and Technology for their collaborative efforts in holding this conference that brings together knowledgeable and interested parties involved to discuss lengthily the various aspects of the industry and the serious problems that seriously beset it.

It is a foregone conclusion that with the expertise of the speakers and the participants in this Conference, the results would contribute immensely to hastening the development of our dairy industry. I would suggest, however, that after the results of the conference have been presented to the proper Authorities, a

regular follow up be carried out to ensure implementation of your recommendations. Otherwise it might go the way of many good programs and projects – in the file shelves gathering dust for lack of action of the implementing authority. But knowing the foresight and dedication of the organizers of the Conference-Workshop, the dairy industry of the Philippines couldn't be in better hands.

Congratulations again to all of you – organizers and participants – and may you have more of this kind of scientific activity in the future.

THANK YOU.

Workshop III

**GOVERNMENT THRUSTS AND PROGRAMS
FOR THE DAIRY INDUSTRY**

**PCARRD, LOS BAÑOS, LAGUNA
30 OCTOBER 1986**

WORKSHOP III
“GOVERNMENT THRUSTS AND PROGRAMS FOR THE
PHILIPPINE DAIRY INDUSTRY”

October 30, 1986
PCARRD, Los Baños, Laguna

Introduction

The workshop participants convened at the PCARRD Headquarters at Los Baños, Laguna on October 30, 1986 to review present thrusts and programs of the government. The group was welcomed by Dr. Patricio S. Faylon, Director, Livestock Division, PCARRD in behalf of the Director-General.

Key personnel of the various government offices delivered papers on national research and development programs – the Bureau of Animal Industry – Dairy Development Division, the Livestock Development Council Circa 1986 to 1992, DTRI's Thrusts and Programs for Dairy Development, and the “Government Thrusts and Policies Towards Dairy Development.” A “Concept Paper on National Breeding Program” was prepared by a team of experts and was presented by Edwin G. Wagelie of DTRI.

The workshop leaders reported the recommendation during the plenary session and considered the views of the participants for government support.

WELCOME ADDRESS

Dr. Patricio S. Faylon, PCARRD

We are honored to welcome you all to PCARRD – the home of the secretariat of the National Research System for Agriculture and Natural Resources. In particular, the Livestock Research Department (LRD) of PCARRD is privileged to be an active participant to this workshop/symposium, “Hastening Dairy Development in the Philippines.”

PCARRD thru the LRD is mandated to systematically plan, monitor, evaluate, and coordinate R & D projects in dairy commodity being implemented by various government agencies and to a certain extent those of the private sector. In addition to this mandate, the capability of the dairy commodity network is being strengthened through our scholarship/manpower and station development programs. These activities are our modest undertakings in support of the national dairy development program.

In so many forums, the need to develop the dairy industry is stressed. The huge volume of milk importation costing us no less than \$75 million in 1985, not

to mention the critical sector of our population, or the children who need this vital commodity are sufficient justifications for us to work for the development of a "real" dairy industry. Our dairy industry today is basically the reconstitution and repackaging of dairy imports. It is apparent therefore, that strong government policy decisions were not promulgated nor properly implemented to accelerate development of the industry. The current activities and support services that the dairy industry is getting today are not that significant to propel the industry to its proper place.

This situation is a challenge to all of us, particularly the scientists around. We have to produce the facts to support policy recommendations and implementation. Furthermore, we have to develop the technology for verification/adaptation and dissemination through the various action projects. Rest assured that you could count on us on this endeavor.

With this, in behalf of the management of PCARRD, let me express the hope that you would have a fruitful day.

Thank you.

NATIONAL DAIRY RESEARCH AND DEVELOPMENT PROGRAM

Patricio S. Faylon

Director, Livestock Division

Philippine Council for Agriculture and Resources Research and Development

Introduction

The R & D thrust of the Dairy Commodity is to develop applicable technologies supportive of the target and goals envisioned by the Dairy Industry Development Act of 1979. The goal of the Act is to increase local milk production, reduce dependence on imports, and eventually establish an indigenous dairy industry. The accomplishment of these goals will increase rural income, improve nutrition and standard of living.

In the immediate future, the thrust shall be to increase productivity of available animals through improved feeding, breeding, and management systems. It recognizes the fact that although animal population seems adequate, the productivity remains low. The present dairy population can also be improved by upgrading, but this can only be fully realized with better management.

Secondary R & D thrusts would be technology transfer, production economics, and animal health in accordance with the directions set by the National Dairy Program.

Research Priorities

The different R & D activities are grouped into three according to priority.

Under priority I, the R & D activities involve two major areas of concern namely: improvement of productivity of dairy animals and animal health. The thrust is to improve current low productivity of dairy cattle, buffaloes and goats through efficient feeding and improved breeding and management systems. Studies on the epidemiology of dairy diseases and parasites should be continuously done since animal health problem affects production efficiency as well as investment cost. The herd health program appropriate to smallholder dairy farming shall be developed in the milk shed areas.

There is a need to determine antibody responses of dairy cattle and buffaloes to hoof and mouth disease (HMD) since this disease which is of common occurrence incapacitates the animals affected.

Priority II would include activities on technology transfer systems, socio-economics and marketing. The thrust is to develop needed data as basis for formulating an effective and acceptable delivery system of production technologies for the benefit of dairy farmers, both at backyard and commercial levels, particularly

in the identified dairy zone areas. The limited studies in socio-economics and marketing necessitate activities in this area to establish benchmark information which serves as guide towards the establishment of economically viable dairy enterprises by prospective entrepreneurs.

Priority III involves the areas of processing and utilization. R & D activities include effective utilization of carabao, cow and goat milk for manufacture of marketable dairy products as well as evolving acceptable standards for grading raw and pasteurized milk. Processing of indigenous milk products and utilization of local materials ("low cost technology" method) are considered under this priority.

Research Activities

Despite the problems which beset the industry, no substantial work has been done to generate technology in dairy production and processing primarily because of limited funding available to the dairy commodity.

At present, the R & D projects being implemented include basic and applied research; actual dairy production, processing and marketing; and dairy-development projects undertaken by government agencies, notably BAI, DTRI-UPLB, and other agricultural institutions.

The problem areas for which a number of technologies have been developed are on the following disciplines:

- i Breed and strain improvement, reproduction, and physiology
- ii Nutrition
- iii Management (commercial and backyard)
- iv Dairy cattle diseases and parasites
- v Processing and utilization

The National Dairy Commodity Team identified technologies which should be tested in different areas for verification (Table 1).

Research Needs

The gap analysis of the national priority areas for dairy show that researches in the following areas are still wanting:

- i Communication strategies to support the existing milk collection programs in particular, and dairy development in general
- ii Effective technology transfer systems
- iii Economics of backyard dairying, fodder production and milk collection schemes
- iv Marketing Systems
- v Evaluation of HMD vaccination by antibody level titration
- vi Control of prevalent diseases and parasites
- vii Integration of dairy project with existing crop production.

Table 1. Technologies for adaptation/verification

Technology	Where Generated	Special/Items Involved	Test Area
Production			
1. Use of milk replacers for calf raising	DTRI	Cattle, buffalo, goat	Sorsogon, Alabang Baguio
2. Zero grazing for dairy animals	DTRI-UPLB Private Sector	All species of dairy animals	Sorsogon, Baguio, Southern Tagalog, (Batangas, Cavite, Laguna)
3. Use of urea as NPN source at the rate of 1% of concentrates ration	DTRI-UPLB ANSA farm	Dairy cattle	Southern Tagalog Sorsogon, Bukidnon
4. Proper milk handling at village level	DTRI-UPLB	Milk from cattle, buffalo goat	Southern Tagalog
5. Use of Zebu x Holstein crosses (Brahman and Sahiwal)	Private Sector	Holstein, Brahman, Sahiwal breeds	BAI Stock Farms (Through A1 Holstein blood may be introduced to the Zebu breeds)
6. Urea-molasses mineral block	UPLB/CLSU	Growing and grazing carabaos	Southern Tagalog, CMU, USM
7. Use of dried poultry manure for dairy cattle at 20% of the total dry matter intake	DTRI-UPLB	Lactating and growing heifers	CMU, Baguio Dairy Farm, Southern Tagalog, Sta. Maria, Bulacan
8. Supplementation of rice straw with ipil-ipil and dried poultry manure	DTRI-UPLB	Dairy cattle	Southern Tagalog, Sta. Maria, Bulacan, Bukidnon, Ilocos, Sorsogon.

Table 2. Gap analysis of the National Priority Research Areas for dairy as of January 1986

Priority Rank and Area	Completed	No. of Studies On-going	Total
PRIORITY I			
1. Feeding and economic studies on dairy cattle	4	2	6
2. Studies on performance of grade and purebred dairy cattle/Murrah buffaloes under grazing and range management systems	3	—	3
3. Upgrading/breeding program for cattle, buffalo, carabao, goat using purebred bulls/bucks	5	1	6
4. Studies on the utilization of agro-industrial and other non-conventional feedstuffs for milk production	13	2	15
5. Studies on milk production in improved grass and legume pastures	3	1	4
6. Investigation on the establishment of the nutrient requirements of dairy cattle buffaloes, and goats for growth, maintenance, reproduction, and milk production under Philippine conditions	6	10	16
7. Epidemiology of dairy diseases and parasites in the Philippines	11	—	11
8. Studies on the physiology and genetics of external parasites and its resistance to acaricides	—	—	—
PRIORITY II			
1. Communication strategies as support for the existing milk collection program	—	—	—
2. Development of effective systems of technology transfer for dairy production	—	—	—
3. Economic of backyard milk production using dairy cattle, buffalo, and goats (1-10 cow/doe herd) and commercial operation in identified dairy zones	1	—	1
4. Economic studies on fodder production in identified dairy zones	—	—	—

Table 2 (Continued)

Priority Rank and Area <i>na</i>	Completed	No. of Studies On-going	Total
5. Studies on the existing marketing systems of fresh milk and different indigenous dairy products	1	—	1
6. Evaluation study of HMD vaccination among dairy buffaloes by antibody level titration	—	—	—
PRIORITY III			
1. Utilization of dairy by-products	17	7	24
2. Studies to evolve bacteriological standards for market milk and dairy products	4	1	5
3. Economic studies on the existing milk collection program	—	—	—

THE BAI ROLE ON NATIONAL DAIRY DEVELOPMENT

Jesus B. de Guzman
Chief, Dairy Development Division
Bureau of Animal Industry

The Bureau of Animal Industry has been given the task of promoting and developing the livestock industry in the Philippines.

In terms of National Dairy Development, the BAI has seven (7) of its nine (9) divisions directly or indirectly involved in developing the dairy industry. These are the:

1. Regulations and Control Division – This division undertakes the control, prevention and eradication of livestock and poultry diseases; implements quarantine measures to prevent disease introduction into the country; controls and regulates importation and exportation of animals and animal products to and from foreign countries and their transshipment through the country.
2. Laboratory Services Division – This division undertakes the production of vaccines, bacterins and antigens needed in the prevention and treatment of diseases. For the dairy industry, the products being produced are anthrax vaccine, Hemorrhagic septicemia and contagious abortion (CA) antigen. It also operates the National Animal Disease Diagnostic Center and the laboratory that performs the chemical analyses of forage, feed ingredients and finished feeds.
3. Feed Control Division – This division handles the regulation and control of the importation, manufacture, distribution and sales of livestock feeds, feed ingredients and additives.
4. Livestock Marketing Division – At present it handles the promotion and development of the livestock auction markets in the country. It is now planning to undertake a study of the development of milk and milk products marketing.
5. The Livestock and Poultry Propagation Division – This division handles the National Artificial Breeding Center (NABC) which is responsible in the training of A.I. technicians and maintains selected cattle and buffalo bulls (beef and dairy) for semen collection. Imported semen is kept at the center and distributed to all A.I. units doing artificial insemination of large cattle.

6. Livestock Research Division – This division undertakes researches in breeding, feeding, management, and pasture production for small and large animals.
7. Dairy Development Division:

Present Activities:

The division operates five (5) programs that support the development of the dairy industry.

These are:

- a) Dairy Farm Development – Three farms are being operated with the objective of propagating dairy animals for dispersal and for milk production purposes. These farms have at present a total population of 538, of which 266 are cows. The average milk production of the cows is 5.6 liters/day.
- b) Milk Collection Scheme – This scheme has the purpose of ensuring a profitable market for the milk produced by the farmers. In Bulacan, Pampanga, and Nueva Ecija, the BAI collects only 25-35% of the milk produced in the locality. We encourage the farmers to sell their milk to private buyers who offer a much higher price and we collect only those that are not purchased by these buyers. In Sta. Maria, for example, the daily milk production in this area is about 1,100 liters of which 700 liters is carabao milk and 400 liters cow's milk. Of this production, BAI collects all the cow's milk and only 20 liters of the carabao's milk.
- c) Dairy Extension, Health and Breeding Services. In support to the milk collection scheme the BAI provides dairy extension, animal health and artificial breeding services in the BAI milk shed areas in Bicol and Central Luzon. As the conception rate with artificial insemination is still quite low. BAI also provides a catch-up bull to service cows which have failed to conceive after two (2) inseminations in order to effect a shorter calving interval.
- d) Animal Dispersal – In the milk shed areas, the BAI has dispersed various type of animals. About 2,100 head Brahman type animals have been dispersed in 7 milk shed areas. These are intended as a breeding base in the production of crossbred dairy cattle. Crossbred dairy cattle have also been dispersed in 4 milk shed areas. Buffalo and crossbred dairy bulls were also given as catch-up bulls in the dispersal sites.

In the cattle dispersal program, one weak point is the policy of getting the first offspring only as share of the government. This policy is not effective in terms of the number of recipient-beneficiaries and the quality of offspring. Hence, the policy was changed. The new policy is that the dam is the one that is redispersed and the offspring will be retained by the farmer recipient. In this way more recipients will be

benefited and the farmers insure that the bulls/semens used in breeding the cows is of top quality as the offspring will be his.

- e) **Milk Feeding Program** – This program started in 1978 with the objective of improving the nutritional level of the malnourished children and to increase acceptance and consumption of fresh milk among our children. To date there are 112,283 children who have benefited from this program.

With all these programs together with the dairy program of other agencies, it seems that there is still no significant increase in the number of dairy animals, no improvement in the quality of the milk produced and a lot of other questions about the profitability of dairy business, the profitable herd size for the backyard farmers, the economic volume of production by the cow and a lot more questions need to be answered and shown to the farmers to encourage them to go into the dairy business. With this in mind, the BAI has made a new decision to pursue an activity that will best answer the above problems and better promote dairy development in the country.

The New Decisions

1. To develop various dairy farming systems simulated on actual farm conditions in the Philippines using an approved, effective but easily adaptable dairy farming technology.

The farming system to be developed are:

- a) Dairy Farm-Units of 1, 2, 3 and 5 dairy cow herds in rice producing areas to be located in Sta. Maria, Bulacan.
- b) Dairy farm units of 5 cow herds in coconut-producing areas to be located in Sorsogon, Sorsogon.
- c) Dairy Farm Unit of 5 cow herds in sugarcane producing areas to be located in Calamba, Laguna.

The above demo dairy farm units in the rice, coconut and sugar cane producing areas will be fully documented to serve as a total in motivating farmers to go into dairy farming, improve their farms and increase their income. It will be opened for use by all agencies and institutions promoting dairy farming in the Philippines. The other objectives are: to demonstrate the profitability of clean milk production; to serve as a venue for evaluating new technology as well as to develop new technology applicable to the Philippines.

2. **Concentration of Cattle Dispersal**

To disperse to Sta. Maria and surrounding towns 2,000 Brahman type cattle in 3 years as a breeding base for dairy cattle production. This will be supported by A.I. technicians, extension and animal health services. Exten-

sions facilities and motorcycles for proper implementation and supervision of these projects are now available and ready.

3. To upgrade the 2,000 cow herd Busuanga Stock Farm using semen of high test Holstein Friesian bulls.

All the F1 females from this farm will be placed in Bulacan for exchange with F1 male offspring of dispersed cattle under the new dispersal scheme. With this, there will be significant built-up of dairy cattle in Bulacan that will make the running of the Sta. Maria Dairy Plant economical.

4. To strengthen the Sta. Maria Dairy Farmer's Federation to enable the Barangay Dairy Association to produce, test and collect their milk and transport it to the plant and to function as an effective dairy cooperative. Once this is done, and with economic volume of milk and good market, then they will be prepared to operate the dairy plant.

The above will be the role the BAI will play in the National Dairy Development. Unlike before, we now have appropriate resources to properly implement these projects. We just hope enough MOE funds will be available.

THE CHANGING ROLE OF LDC CIRCA 1968 TO 1992

Vito F. del Fierro, Jr.
Livestock Development Council
Ministry of Agriculture and Food

The Livestock Development Council draws membership from the government and private sectors. The members meet regularly to tackle the problems and issues that beset the livestock industry.

To enable the LDC to function smoothly (its total staff number only 30) it draws support from fees collected from the registration of large cattle. Part of the fees collected go to a Livestock Development Fund (LDF) which is being used to carry out the functions of the Council and assist accredited private organizations or associations in the development of the Livestock and poultry industry in all its aspects.

1984-1985 (Subject to Verification and Reconciliation):

1984	1st Quarter	₱ 312,945.21
	2nd Quarter	340,572.24
	3rd Quarter	314,505.57
	4th Quarter	304,292.27
1985	1st Quarter	282,682.76
	2nd Quarter	286,547.07
	3rd Quarter	326,341.40
	4th Quarter	<u>145,654.29</u>
		<u>₱4,329,896.60</u>

Last year (1985), the LDC teamed up with various private organizations so that some 42 joint projects and activities were undertaken. Among these were the following just to name a few:

- 52nd Annual Scientific Convention of the PVMA
- 2nd International Livestock and Poultry Fair
- FCRAP Secretariat
- First FCRAP Rodeo sa Philcite
- Seminar/Workshop on Dairy Policy and Strategies of the PDC at Tropical Resort Hotel
- Seminar/Series Lecture on Endocrinology and Viral Diseases at UPCVM
- "Banggitin Natin" Radio Program

- PSAS Journal Publication
- Jose Mari Mercader Speaks Again
- Intensification of Extension Information for Farmers Regarding the Integration of Livestock with the Cropping Pattern in Bicol River Basin Development Program
- VPAP 13th Annual Convention at the Manila Intercontinental Hotel
- Sorsogon Dairy Farmers Association
- Liliw Hog Raisers and Marketing Association, Inc.
- Earthman Communications Foundation, Inc.
- 78th Annual Convention of PVMA
- Philippine Agricultural Journalist, Inc.
- 22nd PSAS Annual Convention at the PICC
- Philippine Journal of Veterinary Medicine
- Philippine College of Veterinary Medicine Yearbook

Now the winds of change are blowing willy-nilly at LDC. We are going to accredit breeder farms that sell breeder stock be they cattle, carabaos, goats, and poultry and even companion animals like cats and dogs. The guidelines have been formulated and we will call a meeting of the people concerned come middle of November.

There is a strong move to revise and update the LDC publications in cooperation with the BAI and the AID.

- 1,341 pamphlets on goat raising
- 3,485 pamphlets on cattle raising
- 9,000 pamphlets on poultry raising
- 9,000 pamphlets on swine raising

With the Animal Products and By-Products Training Center at Marulas, Valenzuela, Bulacan and with Mrs. Angelina Rivera of BAI, we are working for a meat grading/classification scheme for large and small ruminants.

A National Cattle Development Program to rehabilitate the cattle industry whose numbers are diminishing is underway and the first draft has been completed.

Our continuing love affair with the BFD, MNR, BAE and FCRAP regarding Pasture Lease Guidelines (we have already met) and if it is any consolation I have some news for you.

Since most of the time we sponsor seminars/workshops we are forming a technical committee or a listing of competent people to conduct lectures and seminars in other regions. We are also listing the minimum standards and amount of lecture aids.

A health program for all livestock species in cooperation with PCARRD is in the drawing board. This program will, in the years to come, put an end to the flare-ups of epizootic, endemic and epidemic diseases that leave livestock raisers penniless and downhearted.

There is now in our office a technical committee composed of animal husbandmen, veterinarians, market analysts, economic researchers, marketing forecasters, price information monitoring experts and livestock market news specialists who will screen and review programs, project studies and proposals before presentation to concerned agencies/committees outside of LDC.

Lastly, we are hatching a proposal for forest ranching including deer farms, crocodile farming, wild duck sanctuaries and agro-forestry activities with Social Forestry people. This, ladies and gentlemen is the wind of change we expect to blow and develop into a cyclone if it must so that our livestock and poultry industry will be developed in all its aspects and LDC will live up to its credo.

DTRI'S THRUSTS AND PROGRAMS FOR DAIRY DEVELOPMENT

Pedro O. Ocampo
Dairy Training and Research Institute
UPLB, College, Laguna

Introduction

The theme for today's workshop is "National Thrusts, Policies and Programs." The role of the Dairy Training and Research Institute in this respect must consider two distinct features.

One is that DTRI is part of the University of the Philippines System and hence shares with the University the broad goals of national development, the functions of research, instruction and extension, and addresses both basic and applied aspects of the dairy science.

Another is that DTRI is a distinct *dairy* institution and hence concerns itself with all aspects of dairying viz production, processing and marketing at local, national and regional levels.

Consequently, DTRI operations are within the conceptual and operational framework of the UP system concerning dairying in its totality.

A Short Look at a Long History

DTRI formally started its operations in November 1962. Funds were provided by the Philippine government and the United Nations Development Programme (UNDP). The creation of DTRI was a result of planning and discussions started as early as 1957, with the Food and Agriculture Organization (FAO) as one of the more active initiators of the move to create a dairy institution to promote the industry's growth. DTRI in its inception was attached to the UP College of Agriculture.

The first Philippine Dairy Law, Republic Act 4041, enacted in 1962 provided funds for DTRI's "research and training" activities. The same law mandated that the Bureau of Animal Industry (BAI) undertake dairy development and the Development Bank of the Philippines (DBP) provide dairy financing.

RA 4718, passed in 1964, placed DTRI under the administrative control and supervision of the UP at Los Baños.

UNDP support to DTRI was for five years. Hence, by 1968, DTRI was supported mainly by funds from the Philippine government.

The early years: 1962-1968

Research and training were the major concerns of DTRI in its early years. Researches on production, including forage development were the main features of the activities. A DTRI Farm and DTRI Plant were established and most researches were done in these locations.

Conferences and workshops among ranchers and prospective commercial dairy farmers were organized whereby most of the clientele groups were commercial ranches. Corollarily, research and training emphasized the needs of these farmers.

Into extension: 1968-1972

In 1967, DTRI explored the possibility of an extension program among smallholder farmers in areas close to DTRI such as Laguna, Rizal and Batangas. By 1968, DTRI ventured into its first smallholder-farmer-based program. This was the Los Baños Milk Collection Scheme (LBMCS), which was initially designed to "study patterns and pilot-test strategies in dairy extension." The LBMCS later on became a major institute activity involving more than 500 farmers in Laguna, Rizal and Batangas. Program components included milk collection, processing and marketing, extension-education, technical services and cooperatives formation.

This program was discontinued in 1972.

In the meantime, dairy research and training activities continued which now included the training of smallholder farmers and the research on smallholder farming systems.

A transition period: 1973-1974

Routine activities on dairy research and instructions continued but two major features characterized this stage:

One was training. In 1973, DTRI started to host the FAO-Regional Dairy Development Training Center for Asia and the Pacific. This Center provided training on dairy production and technology for Asian countries. Hence, DTRI's training activities within this period covered national and regional client groups.

Another was a strengthened linkage with the National Artificial Breeding Center. Dairy upgrading, started even before, became a hallmark of this stage.

Into rural development and new projects: 1975-1980

In 1975, the milk collection activities of DTRI was expanded into the Milk Collection Program, with a research orientation incorporated into a primarily action program. Rural development concerns was also directly addressed. Hence aspects other than dairy production like nutrition, community health, family planning and livelihood projects were covered.

Corollary projects on extension implemented were:

1. *Importation of Holstein-Friesians for commercial dairy farmers.* Financed by the DBP, 10 commercial dairy farms were established in Batangas and Quezon. DTRI provided the technical and advisory services and collected the milk from the farmers.
2. *Dairy Upgrading.* In addition to AI, dairy bulls and bucks were distributed. The idea was to produce dairy type animals for milking in the future.
3. *Dairy Dispersal.* Limited distribution of dairy cows and dairy goats to validate the technical and economic feasibility of managing dairy types animals under smallholder production systems.
4. *Integrated dairy farm and orchard.* With the provincial government of Laguna, a dairy farm was incorporated into an existing coconut/orchard area to validate the concept of dairy-crop integration.

These are projects illustrative of DTRI's outreach orientation during this period, involvements beyond the University and beyond dairy production.

Meantime, training with FAO-RDDTCAP continued; instruction was carried on with new dairy courses incorporated in the UPCA curriculum.

A return to the dairy focus: 1981-1985

In 1981, there was a re-orientation of focus and a re-direction of activities. Dairying became the main focus again. Explorations into rural development aspects were discontinued and emphasis was made on internal programs.

The Milk Collection Program was turned over to the KK in 1982, for the latter to eventually turn-over to the farmers.

Upgrading activities were limited with the Philippine Dairy Corporation now assuming the lead. So with dairy dispersal scheme, which PDC now implemented on a more extensive scale.

Training with the FAO-RDDTCAP which moved to Thailand in 1980 focused on local client groups. DTRI at this time had drawn a listing of more than 20 short-term and long-term courses which served more than 100 clients/year.

The major outreach program was the School Milk Supplemental Feeding Program geared towards improving nutritional levels of school children and evaluation of nutritional responses to milk feeding.

Research and instruction were carried on as actively as before.

Linkages with external agencies, however, were reduced.

Within this period, also, DTRI was attached again to the UPCA.

1986 And Beyond: The Thrusts

It is against this historical background, that the thrust of DTRI in the coming years is to be sought.

In mid-1986, DTRI formed an Operations Review Committee to look at DTRI's operations, thrusts and programs in the light of current industry develop-

ments and provide guidelines as to how DTRI can more effectively respond considering its mandate, technical expertise and resources.

What is to be presented as DTRI's thrust and programs are based on the report of the Operations Review Committee.

The context of DTRI's involvement

The Committee looked at the current status of the industry using a problem-centered focus.

The general problems were categorized into production, processing, marketing and government support.

Along *production*, the major problems identified were:

1. low milk production
2. high cost of production/milk collection
3. lack of unsustained interest of farmers in dairying.

These problems are largely interrelated. Low volumes and high cost of production are due to a gross shortage of milking animals and the non-identification of a distinct dairy type of animals best suited (production and adaptability) to local conditions and inadequate production technologies of farmers. It is therefore a serious matter of increasing number of milking animals, the breeding for the right dairy type, and technology transfer strategies to improve dairy production systems.

High cost of production and collection result from the above problems: production cost is high since it is not the right animals and the right technology; collection cost is high since volume of milk collected is low. Farmer interests are either absent or unsustained, again, due to the above problems.

Along *processing*, the problems are lack of or inadequate facilities and equipment for dairy manufacture (there is a heavy dependence on imported facilities and equipment), limited manpower, and a very limited linkage between dairy technology generators and the industrial dairy sectors. There are technologies generated but they largely concern inadequate technologies at the cottage or home industry levels.

Linkage between DTRI and the industrial sector must be established and strengthened so that DTRI's technologies may be adopted by the industry and the problems identified by industry itself can be acted on by DTRI. Likewise, efforts to develop new products for small-scale/home based manufacture, design of equipment and facilities for this type of processing must be undertaken.

Along *marketing*, the problems revolve around the inability to effectively market the milk produced (inspite the low volumes produced) and this may have been due to poor marketing and distribution systems, the high cost and perishability of the products; and the "non-preference" by consumers of the forms of products now being marketed. Market development had not been effectively addressed despite marketing efforts by both government and private sectors. Marketing expertise is a necessary ingredient for the industry's growth.

A problem common to all of the above is the continuing importation of milk and milk products at dumping price which is a disincentive to production, processing and marketing.

A problem common to all of the above is the continuing importation of milk and milk products at dumping price which is a disincentive to production, processing and marketing.

At the *government* level, political will had been marshalled before. Even then, support had proven inadequate. More so at the present time. This had resulted in the absence of a unifying policy, shortage of funds to support programs and projects, and inadequate infrastructure to sustain the industry's growth. It also resulted in a lack of coordination and integration of efforts in production, processing and marketing.

The Philippine Dairy Corporation is the government body created to undertake these functions. As of now, however, PDC's operations are almost suspended. Irrespective of how its eventual status would be, the need for such a central and coordinative body is recognized. The PDC, which is a creation by law, could perhaps be re-organized to make it serve the needs of the dairy industry more effectively and efficiently.

DTRI's Directions

Within the context of these general problems, DTRI, as a UPLB unit engaged in dairy research, instruction, training and extension, must seek its role.

In general, DTRI shall involve itself more actively in dairy development activities at the local, regional and national levels considering its distinct expertise, experience, manpower, facilities and technology resources. This more active involvement shall be directed towards both small-holders and commercial producers with emphasis on the former in technology, both small medium scale and industrial sectors shall be served with emphasis on the former; in marketing, all the market group, A, B, C and D will be addressed.

DTRI shall aspire to have its influence felt in national policy making and program planning and evaluation levels, considering that it has the objective expertise to contribute positively.

DTRI shall strengthen its linkages with all sectors engaged in dairying: NABC for breeding activities; MAF-BAE, MAF-PDC, for policy and operational concerns; agricultural schools and institutions for educational and information programs; the industrial milk processors for the necessary linkage between local technologies generated and the needs and problems of this sector, farming-systems based agencies for the possible integration of dairy production and their programs; nutrition agencies, for the promotion of increased utilization of dairy products for improved nutrition particularly for the vulnerable age groups; among any and all sectors where DTRI's involvement are relevant and necessary.

DTRI's role then shall be more active and directly involved in dairy and related development within UPLB and beyond.

Internally, DTRI shall plan and manage its own programs guided by considerations of cost, efficiency and relevance. Cost cutting measures are to be instituted considering how limited government resources are: income generating activities are to be intensified to supplement its own maintenance and operating requirements as well as management of its R & D programs.

Goals and Objectives

The Institute commits itself to the national goal of attaining self-sufficiency in milk and milk products and the improvements of the quality of life of the people.

General Objective

Development of the local dairy industry through research, training, extension and instruction.

Specific Objectives

1. To provide the answers to basic and applied problems of the industry through research;
2. To develop the manpower needs at all levels through formal and informal methods of education in order to promote and sustain the growth of the dairy industry;
3. To promote awareness, interest and transfer/adoption of improved dairy and related technologies to end-users;
4. To share its expertise on dairy research, manpower development, and extension with other relevant agencies concerning the industry particularly in policy review and formulation, program planning and plan implementation.

Policy Guidelines/Program Thrusts

Based on the problem analysis, the identification of DTRI's possible contribution and the statement of goals and objectives, the following guidelines/thrusts shall be adopted.

1. Research

Dairy production research shall focus on increasing the base of dairy animals including breeding for a dairy type animal best suited to local conditions. Studies on management systems should focus on optimal cost production technologies.

Dairy processing research shall emphasize development and characterization of products considering preferences and purchasing capacities of the local markets. The fabrication of dairy equipment from locally available materials and dairy products packaging technologies will also be addressed.

Marketing research on distribution systems, market profiles and preferences will be undertaken. It will be closely tied-up with processing and production research.

The above points are matters of emphasis, with DTRI still to continue with its basic research on production and processing.

2. Instruction

Continuing review of the needs for manpower and the design, implementation and evaluation of dairy courses are to be undertaken within the context of the University's degree granting units.

3. Training

As with instruction, DTRI shall continuously review the manpower needs of the industry and consequently design, implement and evaluate new and on-going training courses/modules as to their relevance, effectiveness and cost.

4. Extension

DTRI shall continue to review dairy extension needs and design, implement and evaluate appropriate technology transfer methods to effect adoption. Feedback must be monitored and evaluated. Such technology transfer methods may initially be pilot-tested by DTRI or fed directly into the over-all extension network for dairy development.

A Sampling of Programs

DTRI will presently draw up its medium-term and long-term plans. The above review will serve as a major basis of the plan; substantive inputs are expected from these workshops; consultation with other sectors will continue.

For now, however, some concrete steps have been taken to operationalize the directions and thrusts defined. A sampling of such steps is drawn:

1. *A Breeding Program on Holstein-Brahman Crosses* geared towards the identification of a dairy type animal best suited to local conditions. With the MAF-Livestock Development Council and the Bureau of Animal Industry, a program to crossbreed Brahmans with Holsteins is to be implemented at DTRI. The offspring are to be reared, maintained and milked. Production and reproduction performance are to be monitored and evaluated. Over a 10-year period, generalizations on the performance of Holstein-Brahman crosses as dairy animals, can be forwarded.

2. *A Continuing Program on Holstein-Sahiwal Crosses.* These imported crosses, provided by the PDC, are already in-place at DTRI. Continuing performance evaluation of these crosses over a longitudinal time-frame will yield definite statements on the suitability of these crosses under Philippine conditions.

3. *Support Services to the Southern Tagalog Dairy Cooperatives.* The STDC, a farmer-initiated, farmer-operated dairy cooperative engaged in milk production, collection, processing and marketing will continue to be supported by DTRI. Support services will be on processing, training, education, advisory and management services. ACCI also provides support to STDC in terms of cooperatives development.

The STDC is a classic case of the farmers organizing themselves and assuming the lead in development work with government agencies "merely" providing support. The end-all is a self-reliant, viable, integrated dairy cooperative.

4. *Field Validation of Tested Technologies.* Production technologies already proven at the laboratory/institute level will now be further validated through field trials or field adoption. First in line is the feeding of treated rice straw among selected farmer-cooperators.

Processing technologies, proven under DTRI's processing conditions will be more commercialized. Among these are Lactoflan, which is now commercially produced and sold by STDC. Other technologies like CADTRI and different lines of dairy confectionaries are waiting to be commercialized.

5. *New Dairy Courses.* As part of the Diploma A Course in Animal Husbandry, a distinct dairy major for the course is proposed. New dairy courses both in the Diploma and in the regular curricular offerings are being planned.

Conclusion

In summary DTRI inspite of its rather long history is virtually starting anew. Its programs and activities are to be based on the needs and problems of the industry as of now and also on the basis of projected needs and problems. The plans and programs are to be based also on the outputs of these workshops as well as consultation with other sectors. The review, workshops and consultations are expected to be continuing.

Relevance is going to be a key determinant of program directions. Considerations of economy and efficiency will also be central in mapping out programs

These considerations will apply as DTRI undertakes its traditional functions of research, instruction and extension, within the context of the University and within the overall social and economic environment under which dairy development finds itself

Finally, it is to be emphasized that DTRI's objectives are geared not only on dairy as a commodity to be developed but on the smallholder farmers, who are to be the beneficiaries of and the key participants in the efforts to develop a Philippine dairy industry.

CONCEPT OF A NATIONAL DAIRY CATTLE BREEDING PROGRAM

Edwin G. Wagelie

Associate Professor

Dairy Training and Research Institute

College of Agriculture, University of the Philippines at Los Baños

Introduction

In most countries cattle have traditionally been a main source of high quality protein. But cattle varies widely due to differences in genetic quality, animal health, animal nutrition, and management methods. The production of milk is a case in point. In some "cattle-developed" countries an average cow will give more than 5,000 kilograms of milk per lactation. In other areas, a cow may produce little more than is needed to feed its own calf. Even the accepted milk breeds in many countries yield on the average no more than 1,500 kilograms of milk per lactation period. The importance of animal health, feeding and management must not be minimized. However the key to improving milk productivity is *upgrading genetic potential*. The obvious answer is that improving genetic potential of cattle must lead to better nutrition for more people. This is true of course, as far as it goes. But livestock genetics is deeply involved, not only with a nation's nutrition, but also with its employment level, its agricultural efficiency, its basic standard of living, its domestic economy as a whole, and its balance-of-payments position vis-a-vis other countries. This is because genetic improvement of cattle concerns improving productivity – the relationship between output and input. In the case of livestock, output means human foods; input means animal feeds. One of the main factors determining this relationship is the total relevant inherited characteristics of the animal in question. Improve these and you improve the output-to-input ratios. Productivity has yet another meaning when applied to cattle: *reproductive performance*. Cows with improved genetic potential supported by adequate feeding and management, usually produce more calves. First calving is earlier, and the interval between calving can be shortened. More calves mean more cows and more bulls. And so the "positive spiral" is helped to continue.

Basic Concepts

1. *General Consideration*

Before embarking upon any genetic improvement program, it is essential that its planners establish the ultimate goal or goals of the program. These may differ

greatly from region to region, depending upon local environment, the role played by cattle in the economy and ecology; and to limiting factors such as labor, land or feed. For example, is the aim to improve milk production only, milk and beef production, milk or draft power, or all three? From the economic point of view, is the aim to produce milk at any price? Or must the availability of labor, land and/or feed be taken into consideration? It has been shown that the greatest improvement can be expected if the goal is for the production of a milk/beef cattle rather than if the goal shall be limited to either milk or beef production. Also, it is more practical to implement in some future date bull pregnancy-testing programs for dairy cattle with meat sometimes produced as a by-product and dual-purpose (milk-beef) cattle.

The breeding system shall therefore be to crossbreed or upgrade the indigenous female population which are basically Brahman grades (Zebu) to an exotic dairy breed, the logical choice being the Holstein-Friesian due primarily to its superior genetic potential for milk and general combining ability.

It has been illustrated that the milk production responses of the indigenous cattle to improved management are less than the exotic breeds. This lack of sensitivity to a better environment reflects the fact that they have been under selection for productive traits for a shorter period of time and that they have evolved in an environment where poor management was the rule and where, therefore, ability to thrive was of greater value than the ability to produce at a high level. Due to the absence or low selection pressure imposed upon them, genes for high production is expected to have a low frequency.

One point of discussion at this phase of the breeding program is the question of hybrid vigor. It is often argued that for crossbreeding to be worthwhile, the crossbred offspring should be superior to the better parent breed, in this instance, the Holstein-Friesian. However, in the tropics, where crossbreeding involves the use of sires (or semen) from a productive breed on females of a low-producing indigenous breed, this argument would not be valid. Under tropical conditions, crossbreeding can be regarded as successful if the offsprings are sufficiently better than the indigenous female stock. Thus, hybrid vigor has not been aptly demonstrated for most dairy traits.

After the production of the offspring ($1/2 N - 1/2 HF$), it appears relevant to stop the crossbreeding process and follow a system of *inter se* mating. Thus the program should be looked at this point as a selection program, from the economic point of view, of the best animals in the population. The selection should be directed exclusively towards milk yield, since with this process, unhealthy and infertile animals will eliminate themselves and those of a type or temperament unsuited to milk production will be automatically culled as poor producers. Some importance might be given to some dairy conformation such as leg set and udder support but the aesthetic traits such as color and pattern should be ignored.

3. *Disposal of Cull*

All culled females including the crossbred bulls could be placed in a feedlot for fattening. Main consideration here is the ADG the animals will make in the feedlot. Whether they will be fed to reach a certain weight or set a limit to their stay in the feedlot would be left to the discretion of the cattle raiser. Enough information are available to show that this crossbred animal should make a higher ADG than the indigenous stock; thus the salvage value of this cross will be higher in terms of meat tonnage and the initial goal of producing milk/beef animal shall be partially satisfied.

3. *Sire/Semen Sourcing*

Here we have several options and these are:

- 3.1 In the initial phase of the crossbreeding program, it would be appropriate to import frozen semen from elite bulls of the Holstein-Friesian breed with the PD records of 2,000 pounds of milk or more. Semen from several sires should be used to provide as wide a genetic base as possible, where only one or a few sires are used, not only is there a danger of inbreeding, but it is often impossible to determine whether the results from the crossbreeding represent an individual sire effect or a breed effect.
- 3.2 Adjunct to the initiation of the first breeding phase, it would be necessary to develop a future source of crossbred sires for the production of frozen semen to be used in the *inter se* mating system. If this shall be done in government stations, this would entail the maintenance of a purebred female herd of the Zebu type (American Brahman breed in this case) and running this with Holstein-Friesian bulls or adopting the breeding techniques of artificial insemination using semen from elite bulls of the Holstein-Friesian breed. Another procedure is to develop some arrangements with private dairy farms maintaining purebred Holstein-Friesian cows to breed some of their higher producing cows (top 255 of the herd) to the American Brahman breed through artificial insemination and selecting some of the crossbred male offsprings, collecting and freezing semen from these bulls for use in the *inter se* mating scheme. The American Brahman bulls/semen shall be selected on performance records with special reference to excellent rate of gain.
- 3.3 Another option is to select for testing young bulls out of the "elite" cows in the population. The proportion of cows that might be classified as "elite" and "ordinary" would vary with the size of the population. The important point, however, is that they be classified on their productive characteristics. The bulls chosen for testing from out of these "elite" cows should be closely inspected to see if they are suitable breeding. All test bulls should be mated to a random sample of test

cows from the "ordinary" herd as early as possible. It would be best to get about 40 to 50 pregnancies per bull within a year, that is, if eight bulls are to be tested per year, some 640 to 800 cows would be required in the test herd, assuming a 50% calf drop shall be achieved.

4. *Inter se Mating*

As previously mentioned *inter se* mating of the F1 shall be followed. The general objection to the mating of crossbred to crossbred is the belief that it may result in the production of a heterogeneous population varying unpredictably in yield, size, conformation and constitution and with no fixed characters. This belief originates from the Mendelian law of segregation which states that when the hybrid reproduces, it transmits with equal frequency either the dominant character of one parent or the recessive character of the other. However, Mendel's law of segregation strictly applies only to characters that are under monofactorial control. Most characters of economic importance in farm animals are, however, dependent on a large number of genes of which the individual effects cannot ordinarily be isolated and are not necessarily equal, and of which the phenotypic expression is to a great extent subject to environmental modifications. Characters which are dependent on a large number of genes and which have low heritability, would have little or no increase in variation in the F2 over the F1 irrespective of whether the difference between the parents is large or not.

It is sometimes suggested that animal breeders should follow the example of plant breeders of introducing desired genes into indigenous stock by crossing with exotic stock, and then backcrossing to the indigenous stock, but selecting among the crosses and their descendants those individual which had the valuable genes from the introduced stock, while letting the breeding system dilute out the undesirable genes which were in the introduced stock. Thus, genes for a high level of milk production might be introduced by crossing indigenous *Bos indicus* and exotic *Bos taurus* cattle and, by grading back to the indigenous stock, the valuable genes for milk production might be retained while the undesirable genes governing lack of adaptation to tropical conditions or lack of tolerance to tropical diseases might be diluted out. However, for this method to be successful, the number of genes controlling the desired character must be small and they must have easily recognizable effects; otherwise, they would tend to be lost during the backcrossing. Unfortunately, in dairy cattle, almost all the economic traits are controlled by many pairs of genes.

5. *Dairy Zones*

The implementation of the dairy/beef breeding program shall be confined to designated milk zone areas. At present, two dairy zones have been identified and these are in Southern Tagalog and Bukidnon. It is premised here that in the selection of these zones, the parameters considered are as follows: (a) presence of facilities for the cultivation of fodder and other cattle feeds; (b) familiarity of small hold farmers in some of the basic principles of dairy cattle management;

(c) presence of a good, all weather road; and (d) easy access to an artificial breeding services. The designation of dairy zones aims at introducing the small hold farmer to modern scientific methods of breeding and rearing stock by making them adopt these methods under supervision in their own farms and under their own conditions. The scope, however, is not limited to breeding; it is extended to cover all aspects of development of the cattle industry, including feeding, disease control, management and marketing. An important function of the scheme is the provision of adequate marketing facilities for milk and milk products produced in the small hold farms. No scheme of cattle improvement could hope to be successful unless a ready and attractive market were available for milk and milk products and also for surplus or culled stock. In the absence of remunerative markets, there would be little incentive to production.

In the Southern Tagalog region, a Southern Tagalog Dairy Cooperative has been established consisting of approximately 200 farmers owning about 450 dairy cattle. These farmers are from Tiaong, Quezon province and from San Pablo, Calauan, Santa Cruz, Pagsanjan and Pila, Laguna. It is anticipated that dairy farmers from the province of Batangas, Cavite and Rizal shall later become federated to the Cooperative, thus increasing farmer memberships and the number of dairy cows involved. Most of these farmers were recipients of dairy cattle (1/2 Sahiwal – 1/2 Holstein Friesian) distributed by the government as part and parcel of its dairy development program. The crossbred animals can be considered a true dairy animal since they were produced by crossing two dairy breeds of two species, the *Bos indicus* (Sahiwal) and the *Bos taurus* (Holstein Friesian). The breeding plan for these animals is to breed them with a beef type breed. The American Brahman and then to follow an *inter se* mating system on their F1's. For the indigenous cattle in the zone, the breeding scheme mentioned before shall be followed.

Using a 1984 survey conducted by the BAECON of the MAF of the cattle population in the Southern Tagalog dairy zone, there would be hypothetically about 24,000 breedable indigenous cows thereat. If 1.0 percent of this number could be upgraded to produce potential dairy animals and assuming a 50 percent calf drop can be achieved, approximately 500 heads of additional dairy cows can be introduced. With the present existence of 450 dairy cows, a total of 720 dairy cows could be in the milking line hopefully by the third year. This number will continually progress with a continuous upgrading of the indigenous stock of dairy/beef animals.

If this rate of increase is deemed too slow, two options are open to infuse more animals into the dairy zones: (a) development of government "genetic farms" for the production of the F1 1/2 Zebu Brahman – 1/2 Holstein Friesian and distributing these F1's to small hold farmers. Due to its proximity to the dairy zone in Southern Tagalog, the operation of DTRI farm could be expanded to serve this purpose. Also, a portion of the proposed Calamba Stock Farm could be designated as a genetic farm for the production of dairy/beef cattle likewise for distribution to small hold farmers in the dairy zone. For the Bukidnon dairy zone, the government

farm at Malaybalay (lot 184) and the Mindanao State University Farm at Musuan, Bukidnon could also be tapped for the same purpose; (b) undertake a contract breeding arrangement with the private commercial beef cattle raisers the lines previously proposed by the Philippine Dairy Corporation but with modifications in some of the terms and conditions in order to make the arrangement more attractive to the private cattle raisers.

The next point of contention herein, is the question of what to do with the indigenous cattle located outside the stipulated dairy zones. The breeding approach hereat is a continuous upgrading program using the American Brahman breed. Eventually the nondescript classification of these cattle will be erased and should a new dairy zone be designated, the breeding program will then be initiated with superior grade of indigenous cattle as the base population.

6. *Milk Records*

An important consideration in this breeding scheme is the type of records to be maintained. Although milk yield is the single most important factor in economic dairy cattle production, a number of other factors claim about as much importance. Among these may be mentioned age at first calving (age at sexual maturity), breeding efficiency (or length of calving interval) and dry period. If dairy records emphasize yield only, there would be a tendency to favor breeders with long calving intervals, long dry periods and a late age of first calving. Although it is improvable that the relationship usually observed between yield and lactation length for Zebu cattle in the tropics is due to the genetic make-up of these cattle, it is nevertheless true that improvement in yield that could be attained by increasing lactation length is considerable. A selection based on calving interval, dry period, lactation length and age of first calving may tend to lower the overall intensity of selection for yield, but it should be possible to set maximum or minimum limits for these factors and confine the selection on yield to animals falling within these limits.

A Recapitulation

With regards to the indigenous cattle population, a crossbreeding program shall be followed using an exotic dairy breed, the Holstein-Friesian. Upon the production of the F1 offspring (1/2 Holstein-Friesian – 1/2 N) an *inter se* mating system shall be adopted. The program ceased to be looked upon as a grading-up process but becomes a selection process of the best animals in the population. The selection shall be directed exclusively towards milk yield.

On the other hand, American Brahman semen shall be used on dairy cows (1/2 Sahiwal – 1/2 Holstein Friesian) distributed to small hold farmers by the government as part and parcel of its dairy development program. Once the 1/2 AB – 1/2 S-HF has been attained, *inter se* mating shall likewise be followed.

The scheme shall be confined only to the designated dairy zones which are the Southern Tagalog and Bukidnon regions. Indigenous cattle outside the dairy zones shall be continuously upgraded using the American Brahman breed so that in the event that new dairy zones shall be established, the indigenous cow population will be generally upgraded.

Establishment of genetic government farms, principally at the DTRI, Calamba Stock Farm, Malaybalay Stock Farm and at the Mindanao State University in Musuan, Bukidnon, to supply F1 dairy animals to the small hold dairy farmers in the dairy zones.

A program of feedlot fattening for all culled animals out of the program shall be implemented to enhance their salvage value.

THE NATIONAL DAIRY DEVELOPMENT PLAN (NDDP)

Dante Barboza
Deputy Minister
Ministry of Agriculture and Food

The government thrusts and policies for the promotion and expansion of our dairy industry are embodied in the so-called National Dairy Development Plan (NDDP). Conceptualized in 1979, it has since then undergone several changes. For, while the government's commitment to support the industry has not changed, the thrusts and policies by which the government supports its development depend on changing factors. Thus, every year and even oftener, the underlying assumptions and proposed schemes contained in the Plan are re-evaluated, to test if they remain sound and practical. The objective of re-evaluation is to determine if the same targets could be reached at less cost than originally envisaged. The revised Plan recognizes recent world and local developments, future trends, key factors of success, as well as the constraints and potentials of the industry's development.

Factors of Change

As earlier stated, the NDDP was prepared in 1979. It covered a 10-year period plan on the development of our dairy industry. After six years of implementation the plan has fallen far short of expectation. The new leadership has directed that the Plan be re-evaluated and its strategies for development tested in the light of present world and local developments. MAF is determined to avoid committing the same mistakes.

At the time of the conceptualization of the Plan, the planners envisioned that a world-wide surplus of dairy production will continue in the next few years. And it has been assumed that milk products can be imported at cheaper prices than they can be produced locally. Unfortunately, however, we have no data to support this. Prices of imported products in the long run can be expected to go up, as had already started to happen and we have to be prepared to meet this challenge.

The recent world event known as the Chernobyl incident, had not only affected the economic and ecological environment of countries close to Russia. It had also affected the Philippines. You have read in the newspapers that several brands of imported milk from Holland were tested and found contaminated as a result of this incident. Quite obviously, this event had further underscored the need for us to hasten dairy development so as to provide ample milk supply for local consumption, particularly the infants.

Potentials for Development

The Philippines has available vast unused resource in terms of land, local feed and manpower for raising of livestock. However, the low cattle population, the low milk yield of existing cattle and the total lack of marketing strategy are major constraints to dairy development. Therefore, massive propagation of locally-adapted high milk producing animals and the development of an efficient marketing policy are necessary if we are to increase local milk production.

Experience in Cuba and Australia indicates that high milk yielding animals can be bred from the tropics and experience in India and Indonesia shows that milk production can be organized among backyard producers. Our feedbacks from the field on various on-going dairy projects indicate that:

- a. People in the villages can be trained to become artificial insemination technicians;
- b. Rearing can be contracted to backyard farms; and
- c. Simplified chilling facilities can be installed at village-level as collection centers each serving 2 or 3 adjacent villages.

Strategy

Following a program re-evaluation, we still believe that development of the local dairy industry must be attained through a) establishment of effective marketing system; b) propagation of cross-bred dairy animals in backyard farms; and c) introduction of milk production in the backyard as a supplementary farming activity; and d) government guarantees on disease free-hygienic milk.

High fresh milk consumption can be attained if there is additional supply and if fresh milk can be made cheaper than canned milk. Improved dairy animals can be propagated faster through extensive artificial insemination, and imports of dairy animals.

Targets

The annual domestic milk production of the Philippines is estimated at 10 MT representing only *two percent (2%) of total dairy requirements* of the country. In 1983 alone, the Philippines imported *106 MT of dairy products worth CIF \$140 M.*

We hope to attain a target of local milk production equivalent to 15-20% of the potential national milk market at lower cost.

This reduced cost program entails:

1. Insemination of local cows or heifers. This is combined with importation of approximately 10,000 dairy heifers.
2. Dispersal of dairy animals to backyard farmers.
3. Improved forage and concentrated production.

Government Support Policies and Program

In support of the dairy industry, the government shall:

1. Continue to provide tax incentives that will encourage livestock production.
2. Grazing and credit policies shall be evolved consistent with the requirements of the dairy industry.
3. Encourage and assist through technology transfer and liberal credit assistance – to farmers/investors in agri-business ventures on dairy production and marketing.
4. Include dairy farming as among the agricultural priorities in the overall national development plan.
5. Subsidize cost of training extension, research and support the breeding, veterinary services, and collection system. Through Philippine Council for Agriculture Research and Extension (PCARE), the Ministry shall utilize state colleges and universities for research purposes.
6. Assist to organize dairy farmers into cooperatives in order to systematize procurement of imports, technical and extension services and marketing of products.

As the private sector's participation in the dairy industry continues to grow, the government subsidy will be minimized. The government's involvement in the industry will, also be limited to the formulation of policies and guidelines to enhance its development as a full-grown industry.

In line with this policy, the Ministry of Agriculture and Food has proposed the sale to private sector of the Philippine Dairy Corporation (PDC). The PDC was created as an attached agency under the Ministry, to serve as the implementing arm, providing directions and responsive approaches in carrying out the dairy development thrusts and strategies. One of the possibilities being contemplated by PDC is to pass on to the dairy farmers/cooperatives the business activities of Dairy Development and let the government just provide the necessary back-room support (e.g. Artificial Insemination, Veterinary Medicine, etc.).

We believe, however, that so long as government engages in business which is in direct competition with private business, the latter can not be expected to thrive, much more grow.

All these policies and support programs will be carried out to promote and develop the local dairy industry. The outcome of your workshop should, however, help us re-direct our visions towards the attainment of this goal. The government, I believe, (since the majority of us belong to the public sector) appreciates the effort and commits itself to support whatever plans may be evolved here and policies that may be recommended by you to hasten the development and guarantee the viability of our own dairy industry.

PLENARY SESSION

The paper delivered by Deputy Minister of Agriculture, Atty. Dante Barboza has given a new boost to the dairy development efforts with pledges of government support through policies and programs when he said — “DAIRY FARMING IS AMONG THE AGRICULTURAL PRIORITIES IN THE OVERALL NATIONAL DEVELOPMENT PLAN.”

The participants pursued inquiries/raised points on the following issues which were clarified by the Deputy Minister.

1. The role of extension has been defined by FAO as one of “improving the human resources in rural areas and promoting the mobilization for family and social development.” This definition places the role of extension in its widest perspective and makes it clear that the basic objective of extension is development.

Dr. Mary Ann Franco of LDC pointed out that we have good extension workers but government support is not commensurate to the job they are expected to do. Their TEV's or per diems are not enough and their salaries are very low.

Deputy Minister of Agriculture, Atty. Dante Barboza announced that their first move in the Ministry under the new regime is to increase the salaries not only of extension workers but the entire ministry personnel. Aside from this move, there will be a hiring of one thousand forty three (1043) agricultural field technicians (AFT) which will need ₱45M appropriation from the budget ministry. The AFTs will be provided with such incentives as adequate salaries and promotional prospects and also transport and housing where these are not readily available. AFTs will be hired from the rural sector and their area of responsibilities will be well defined. They will maintain a closer link between researchers and policy makers and have laboratory tested technologies reach the end-user.

2. The need for planning and coordination at the national level. The deputy minister announced reorganization of some national agencies — PCARRD for example shall include extension services to assure that research outputs get out from the confines of the research stations. Linkages with academic institutions all over the country will be effected to come up with comprehensive results.
3. The pulling out of the stock farm at Alabang to Mount Maugong. Alabang has become urbanized and commercialized and the place is not ideal for stock raising anymore. The stock farm will become the National Stock Farm under the Aquino government where the Australian Milking Zebus that will come to the country will be housed

and distributed to the 15 different breeding centers in the country. The AMZs will be used as breeding base and not as milkers.

4. The privatization of the Philippine Dairy Corporation. Prof. P. O. Ocampo of DTRI raised the point on "what happens to the present farmer-cooperators of PDC if it will be eventually sold to private entrepreneurs." The deputy minister said they will remain cooperators by the new owners of PDC so that there will be no disruption of their initial activities. It is gathered from Workshop I that PDC's failure to continue its functions were due to: a) change of government: the national dairy development plan as conceived during the organizational meetings that brought about the existence of PDC was not followed; b) problems had arisen on allocation of resources, there were no formal signing of contracts with farmer cooperators but only verbal agreements; c) absence of a marketing network – along the way some dealers will just fall out; d) curd and cheese including milk were below the standard of private processors. Chilling centers have proved expensive due to low volume of milk collected particularly in Cavite and Batangas. Also, the absence of a standard policy for the implementation of the project contributed to the failure of PDC. Project implementation change as situation change, the national dairy development plan have not yet been followed. The loan interest for example was given at 14% interest but eventually went up to 27%, to 30%. A lot of political turmoil have come during the supposed productive years of PDC, 1982 to 1985, and PDC people cannot answer when asked what happened to the money of the project.

RECOMMENDATIONS

Production Group

The group strongly feels the need to strengthen research and development as the government's main thrust to hasten dairy development in the Philippines.

For development the following thrusts have to be strengthened and improved by the government.

1. Animal dispersal, more on dairy
2. Veterinary services
3. Artificial insemination
4. Effective support systems such as

- a. *Technology Assessment*

Benchmark Survey on farmer's felt needs on selected areas identified for dairy development

- Survey to include also destruction rate of dairy animals.
- b. *Technology Generation*
 - Problem on AI, Breeding and Physiology
 - Strengthening on farm research on establishment of dairy farm modules based on
 - a) size of herd/by farmer/by area (all disciplines included such as health, nutrition, etc)
 - b) cropping system
 - Research on specialized activity on dairy production/support schemes such as
 - a) contract forage production
 - b) calf rearing and development
 - c) heifer production
 - d) milk collection and processing
- c. *Technology Verification*

Research to verify the following have to be conducted.

 - Breed and strain improvement, reproduction and physiology.

Processing Group

1. Develop an integrated national program for technology generation, transfer and adoption and creation of a coordinating body to oversee/monitor the different programs/activities.
 - a. Review/update existing milk product standards.
 - b. With the huge importation of milk and milk products and the present policy on import substitution, R & D activities, training on nutrition education, and extension in dairy technology must be given top priority.
 - c. Develop low cost and appropriate quality control testing methods and facilities applicable to the village level.
 - d. Oversee the optimum utilization of dairy products received as food and to minimize wastage.
2. Policy to give incentives to local dairy producers and processors to increase local milk production and decrease importations of milk and milk products.
 - a. Give premium payment for high quality milk.
 - b. Provide low-cost locally fabricated milk processing equipment and facilities.

- c. Provide incentives to the development of low-cost and new products processing technologies.
 - d. Give recognition to outstanding men and women in the dairy industry.
3. Government should provide the necessary budgetary allocation to support the above-mentioned provisions.

Marketing Group

- 1) Require industrial milk plants to buy local milk.
Corollary to this are:
 - Tariff to support local dairy development
 - Defining a ratio between local and imported milk
 - ... Local milk must be sourced from local producers, or if not possible, the plants should set up their own dairy farms.
 - ... An interfacing mechanism to effect the importation of local milk into industrial plants should be set-up. The mechanism should consider the quantity, quality and price of locally produced milk. In the event of disagreements about these aspects, the decision should be made in favor of the local producers.
- 2) Encourage the production of good quantity milk thru the provision of funds for training, information services, milk collection and chilling facilities and adoption of premium pricing for quality milk.
- 3) Encourage and support farmer cooperatives/organizations to undertake marketing the other dairy related activities with the end in view of having the coops of the said enterprises.
- 4) Pricing strategies of the government should be such that it will not unduly undermine the private sector, specifically the small producers.
- 5) Import restriction on selected dairy products.
- 6) Government support to marketing shall consist of the following:
 - i) market information services
 - ii) credit for dealers
 - iii) tax incentives for sales outlets
 - iv) advertising and promotion strategies
- 7) Establish an efficient monitoring and evaluation system for the dairy industry starting with a definite and comprehensive benchmark on the status of the industry.

PARTICIPANTS AND GUESTS

ABERDEEN	:	Antonio M. Zuñiga
ACCI	:	Leandro Rola Eleanor Manzano
BAI	:	Felixberto Santos Jesus de Guzman Leo Saludares
Business Day	:	Abrino Aydinan
CDEM	:	Hipolito C. Custodio, Jr. Santos Tabuena Lily Besares
Depth News	:	Tony Torres Eddee Castro
DTRI	:	Myrna D. Alonte Leticia P. Palo Rosemarie R. Lapinid Antonia H. Pamplona Onofre C. Martin Orlando A. Palad Alberto Y. Robles Loretta D. Momongan Restituto R. Lopez Ma. Editha V. Cubarrubia Franklin B. Aglibut Teofilo A. Dulay Gregorio L. Javier Iluminada V. Gomez Severino M. Flores Olivia C. Emata Ernani Lapiz Rodolfo E. Cuevas Norma P. Ables Julio O. Gonzaga Antonio A. Rayos Cleofe N. Peralta Ione G. Sarmago Pedro O. Ocampo Edwin G. Wagefie Leonida C. dela Cruz Lourdes E. Resubal

		Felicidad R. Lawas Emerita N. Almazan Clara L. Davide Elizabeth D. Beltran
DBP	:	Pedrito Rabonza
FNRI	:	Estelita M. Payumo Estela Marie Gonzales
GFSME	:	Jesus Tirona Lydia N. Oriel
IAS	:	Cledualdo B. Perez, Jr.
Indian Embassy	:	Katar Singh
ICFH	:	Amparo Banzon Trinidad Gomez
Land Bank	:	T. Claudio
LDC-MAF	:	Vito del Fierro Mary Ann Franco
LFPC, NKKK	:	Francis Gonzales
Magnolia	:	Ricardo G. Acabado Conrado Nievera
Manila Journal	:	Boots Rous
MAF	:	Dante Barboza
NAST	:	Paulo C. Campos Dioscoro L. Umali Melecio S. Magno Clare Baltazar Julian Banzom Jose R. Velasco Clara Y. Lim-Sylianco Stella Marie R. Ramos Romeo Cordoba Luningning Samarita
NSTA	:	Darhl S. Andaya
NEDA	:	Marietta Adriano Dolly Lapinid Maritess Dimayuga
NESTLE	:	Faustino C. Pangilinan, Jr.
NRCP	:	Perfecto K. Guerero Jaime M. Rogus

PCARRD	:	Patricio S. Faylon Edwin Villar Eduardo Magboo Elaine F. Lanting	Private	:	Gov. Juan Frivaldo Rene Abad
PDC	:	Naomi K. Torreta Marilo B. Mogueles Lito Baarde Orly R. Penaflor	STDC UPLB	:	Adolfo Gabatino Conchita Aquino

ORGANIZING, STEERING AND WORKING COMMITTEES

Chairman	:	Dioscoro L. Umali (NAST)
Co-Chairman	:	Franklin B. Aglibut (DTRI)
Secretariat	:	Iluminada V. Gomez (DTRI) Luningning Samarita (NAST)
Documentation	:	Maria Editha V. Cubrumbia (DTRI) Severino M. Flores (DTRI)
Invitations	:	Lourdes E. Resubal (DTRI)
Finance	:	Clara L. Davide (DTRI)
Physical Arrangement	:	Gregorio L. Javier (DTRI)
Rapporteurial Services	:	Pedro O. Ocampo (DTRI) Felix Librero (Dev. Com) Dada Ramos (Dev. Com) Leticia P. Palo (DTRI) Myrna D. Alonte (DTRI) Romeo Cordoba (NAST) Stella Marie R. Ramos (NAST) Elaine Lanting (PCARRD) Mercy Deriquito (PCARRD)
Drafting Sub-Committee	:	Ligaya Garcia (DTRI) Norma dela Cruz (DTRI) Leticia Moog (DTRI) Dominga delos Reyes (DTRI) Camela R. Piamonte (DTRI)
Reproductions/ Printing	:	Edmundo H. Marasigan (DTRI) Donato Paner (DTRI) Roger Trinidad (DTRI)

SYMPOSIUM ON DAIRY DEVELOPMENT IN THE PHILIPPINES

Asian Institute of Tourism
Don Mariano Marcos Ave., Diliman, Quezon City
Thursday, April 2, 1987, 10:30 A.M.

Welcome Address
Dr. Melecio S. Magno
Vice-President
National Academy of Science and Technology

The Honorable Secretary, Carlos Dominguez, Dr. Franklin Aglibut, Dr. Dioscoro Umali, Dr. Romeo Alcacid, Dr. Ramon Valmayor, Dr. Ruben Villareal, Dr. Perfecto Guerrero, members of the diplomatic corps, distinguished guests, ladies and gentlemen.

The National Academy of Science and Technology (NAST), dear friends is privileged to co-sponsor this workshop on the dairy industry. We are happy to have all of us gathered here today so we can talk about the dairy industry.

This workshop is co-sponsored by NAST, the Dairy Training and Research Institute (DTRI) of the University of the Philippines at Los Baños, the Bureau of Animal Industry of the Department of Agriculture, and the Philippine Genetics Incorporated, which is the representative of the private sector.

As you know, the government is not very keen anymore about going into business to compete with the private sector. It is important therefore that the private sector participate in project like this, and eventually to the development of the industries like the Philippine Dairy Industry.

NAST is a multi-sectoral organization. We have Academicians and National Scientists from the entire spectrum of science and Technology. Although NAST was established through a Presidential Decree in 1976, it was only organized in 1978. Since its organization, it has organized seminars and workshops and conferences on issues like this one.

As early as 1979, NAST had organized roundtable conference on the Nuclear Power Plant where representative from the science community and the private sector were invited to this meeting. The report of the Academy was submitted through the Office of the Chairman of the then NSDB which at that time the present speaker. Said report was sent to the Office of the President.

Many events in the world eventually led to the foreclosure of the Bataan Nuclear Power Plant. But the NAST had been in the forefront of issues like this which involve science and technology.

Lately, the Academy has been very much concerned about the dairy industry, hence a series of conferences have taken place. I am very glad that today, the culmination of a series of these conferences, no less than the Honorable Secretary of the Department of Agriculture on whom the development of the dairy industry very much depends, is present with us.

The reasons for the establishment of the dairy industry are indicated as: I think there is no need to figure to you much more about this. The important thing is that we have the resources: the land, the manpower and the know-how that will enable us to set up the dairy industry. The private sector is expected to carry the main burden of developing this industry. We have also the political will as shown by the presence of the new Secretary of Agriculture. So, I think we can establish a dairy industry.

On behalf of our President, Dr. Paulo C. Campos, I welcome you to this symposium, the last of the workshops on the "Development of Dairy Industry" in our country.

Opening Remarks
 Dr. Edwin Magallona
Vice-Chancellor for Academic Affairs
University of the Philippines at Los Baños
College, Laguna

The Honorable Secretary Carlos Dominguez, Dr. Ramon Valmayor, Dr. Melecio Magno, Dean Dioscoro Umali, our honored guests, ladies and gentlemen.

I am here representing Dr. Raul de Guzman, who cannot come today. At the same time a sort of representing also the Dairy Training and Research Institute (DTRI). We at Los Baños perceived the development of the dairy industry along the lines of the development of the Dairy Training and Research Institute. You know very well that the Dairy Training and Research Institute was one of the oldest institutes established at UPLB. Since its inception, it has not had an easy time of keeping itself afloat as well as keeping the dairy industry alive. So let us not deceive ourselves into thinking that the way ahead is rosy for us. So much still remains to be done as far as the development of a strong dairy industry is concerned.

I do not have to emphasize the importance of a dairy industry, this being a group knowledgeable of its importance. If we, having gone abroad, we can compare people from developed countries with people from developing countries, one of the most noticeable differences is that people from abroad are bigger, stronger and taller. They say that this is due to genetic stock. I believe that this is due, to a large extent, to nutrition. In developed countries, children drink milk like children drink water here. But Filipino children also grow big, tall and strong. At this instance we do not have to convince you of the importance of a strong dairy industry. We are very glad that the Secretary of Agriculture deemed it important this morning to grace the occasion. In behalf of the Chancellor, and in behalf of the University of the Philippines, "Good Morning and Welcome to this symposium". Thank you very much.

Dr. Ramon Valmayor. (*Executive Director PCARRD*): To my good friend and idol, a sound supporter of research and development during his early years in Davao, Secretary Dominguez, to my mentor and adviser as a student and a young faculty member at Los Baños, Dean Dioscoro Umali. To the leaders of Philippine agriculture and science, and to our friends in the dairy industry.

"We never outgrow our need for milk", so says a television commercial. And effectively, everyone rushes to the supermarket to get his supply of this almost complete wonder food. The exercise proves to be baffling as there are so many milk brands to choose from. Some come from radiation exposed countries in Europe, and

some come from Malaysia, a neighboring tropical country in Southeast Asia. Why are they exporting milk and our country is importing milk?

What escapes the uncritical attention of most T.V. fanciers is that everytime they buy milk or milk products, they contribute to a US\$72 million kitty that goes out of the country each year. They also forget that most other Filipinos especially those who populate our far-flung island and rural areas, forego this essential commodity not because they are health faddists, but because they simply cannot afford it. They have no money, no T.V. sets, no supermarkets and no milk. I don't know what else they don't possess, but I know they retain their identity as Filipinos, and are therefore deserving of all the dedicated service, planning acumen and managerial efficiency that we who are involved in the dairy industry can deliver.

I was requested by Secretary Antonio V. Arizabal of DOST who was originally scheduled to deliver this message, to address you today, and I am indeed honored to be here. I would like to take this opportunity to extend to each one of you the assurances that the DOST through PCARRD is doing its best to promote dairy development in the country. You have heard Dr. Faylon, Director of our Livestock Research Development present a paper on the "National Dairy Research on Development Program" during the 3rd workshop held last October 30, 1986 at PCARRD. This paper outlined the main thrusts of our R & D activities in this field.

Concretely, I'd like to point out that PCARRD is at present coordinating the implementation of Phase II of the Government of the Philippines-UNDP/FAO project entitled "Strengthening of the Philippine Carabao Research and Development Center". This is a five-year project where the government of the Philippines invest ₱23.4 million and UNDP provides a counterpart funding of US\$1.1 million. Some of its objectives stemmed from the following logic: Since many small-holder farmers keep a carabao or two as a source of draught power in his farm, why not upgrade and develop the available stock of native carabao so that they become not only strong farm animals but better producers of milk and meat? It has been found during Phase I of the study that improved carabao breeds produce as much as four times more milk than native carabaos.

The approach is basically village level and its target clientele are the small-holder farmers: those whose main pre-occupation is crop production but who also maintain one or two heads of carabao for cultivation purposes. In effect this can be a way of meeting the dairy needs of our children especially in the rural areas. This is one area that holds great promise for dairying in our country.

The large ranch-type commercial dairy production system will continue to suffer in the face of vast subsidies that our richer dairy exporting countries extend to their producers. And as long as milk is introduced into our country at a "dumping" price, there will always be a dampening effect on the local dairy industry.

In the development of this industry, PCARRD attracted the interest of the Indian Government to extend technical cooperation with us in village level dairy

production. For all its malnutrition and its huge population, India is completely self-sufficient in its milk requirements and does not spend a single rupee on importing dairy products. We have many things to learn from their experience, and PCARRD is reactivating its Memorandum of Agreement with its Indian counterpart, the Indian Council for Agricultural Research (ICAR) for collaborative work in a number of concerns, foremost of which is dairy production and technology.

One hundred percent (100%) self-sufficiency in our dairy needs is yet a far dream for the Philippines. So much so that 20% will be satisfied for the moment. But even at that rate, a lot needs to be done. The government will have to exercise a political will of steel to curb imports and encourage use of local resources. R & D will have to hasten the development of low input milk production and processing technologies and marketing strategies. Extension will have to multiply and fortify its linkages to reach out to as many people in the rural areas as possible.

It is heartening that the small farmers have always taken an active interest in government-initiated programs. Moreover, the fact that these workshops have taken place augurs well for the dairy industry. Like in any relationship, the willingness to talk and discuss problems is a sign of health. The willingness to honestly plan and discern directions is an assurance of success.

As I end this message, I have many hopes for the Philippine dairy industry. I hope for one, that our commercial producers of milk will continue their struggle against the dampening effects of subsidized milk and milk products being brought in to the country.

The people in the barangays will have greater access to milk produced of their work animals in their ricefields, cornfields, sugarcane land through the carabao upgrading program cooperatively undertaken by the Department of Agriculture, University of the Philippines at Los Baños, Central Luzon State University, Cagayan State University in the north, Central Mindanao University in Bukidnon. Good day and thank you very much.

Dr. Jesus B. De Guzman (*Chief, Dairy Development Division, Bureau of Animal Industry*). Thank you Dr. Ramon Valmayor. Now we go to the presentation of the workshop recommendations to be given by a man who was a former Dean of the College of Agriculture at Los Baños, a former Undersecretary of Agriculture of the then Department of Agriculture and Natural Resources and a FAO regional Director for Asia and the Far East. This man is very much loved by many people particularly those in science, agriculture and small farmers not only in this country but in many parts of the world. To the dairy people, this man has served as an inspiration and nobody can deny that the last three days of the dairy workshop, he has been religiously with us, giving us advices and guidance. And now he is again with us to present the workshop recommendations.

Ladies and gentlemen, may I present to you our beloved National Scientist, Dr. Dioscoro Umali.

Dr. Dioscoro L. Umali, (*Academician, National Academy of Science and Technology*): Thank you Dr. de Guzman for the generous introduction.

As member of the steering committee, they drafted me to present to you the report of the three workshops on dairy development and submit to you the recommendations.

This multi-sectoral workshop on dairy development strategies in the Philippines were initiated by the Dairy Training and Research Institute and the National Academy of Science and Technology in cooperation with the Bureau of Animal Industry and the Philippine Genetics, Incorporated. The moving spirits behind these workshops are Dr. Paulo C. Campos, the President of the National Academy of Science and Technology and the new dynamic director of the Dairy Training and Research Institute.

Workshop I dealt with "Status and Problems" of the Philippine dairy industry held on October 17, 1986, and Workshop II "Support System" for the dairy industry held on October 23, 1986 at the NSTA Executive Lounge, Workshop III "Government Thrusts and Programs" for the Philippine dairy industry held on October 30, 1986.

The participating agencies on these workshops included NEDA, DBP, AXI, Landbank, GFSME, UPLB, PDC, Magnolia, Monterey Farms and STDC. Three working groups namely: production, processing and marketing were formed and conducted sessions simultaneously.

The workshops provided the information that is accessible, comprehensive and up-to-date. This information makes available both facts and point of views and distinguishes between the two, and information for people who play key roles in the development of the Philippine dairy industry.

Most of these people are in this hall. They have visions and commitments to the advancement of dairying in the Philippines. The DTRI staff prepared for me the detailed write-up of these recommendations which could take me about 15 minutes to read. They have status of the Philippine dairy industry. I should not read this anymore because time is of the essence. There are potentials for dairy development, and you could get that in the report. They are all available. Just allow me to present to you the summary of the recommendations. They are the following: The workshop recommends that the Philippine Government give the highest priority to the development of the local dairy industry.

This would require: First, the continuous support to the current dairy programs including milk collection schemes, dairy upgrading projects, research and development and production, processing and marketing, establishment of marketing network, credit and financing, and the establishment of dairy cooperatives. The programs are currently in place in dairy zones in Southern Tagalog, Central Luzon, Bicol Region and Northern Mindanao. Other areas may be identified in the future.

Second, the protection of the Philippine Government of the local dairy industry by requiring industrial milk plants to gradually substitute local milk production for their imported dairy ingredients. The imposition of gradually

accelerated tariff on imported dairy products consume by the high income group, the proceeds of which should be used to support the development of the dairy industry.

Third, the establishment of a body which could effectively coordinate and integrate all dairy programs and activities of the government and the private sectors.

That is the summary of the recommendations. Thank you very much.

Dr. Jesus B. De Guzman (*Chief, Dairy Development Division, Bureau of Animal Industry*): Thank you Dr. Umali. Now we come to the introduction of the guest speaker to be given by a man who is well-exposed to livestock industry. Because of his experience, he now holds three positions. He is the Executive Director of the Livestock Development Council, Vice-President for operation of the Philippine Dairy Corporation, and now the Officer-in-Charge of the Bureau of Animal Industry. He is a very active man, my boss, Dr. Romeo Alcacid.

Dr. Romeo Alcacid, (*Executive Director Livestock Development Council*): Thank you Jess. Dr. Ruben Villareal, Dr. Perfecto Guerrero, Dr. Edwin Magallona, Dr. Paulo Campos, Dr. Melecio Magno, Dr. Dioscoro Umali and Dr. Ramon Valmayor.

One of the present trends in the new government is short addresses and speeches. And with this short introduction, I hope I do justice to the vast accomplishments of our guest speaker today. Our special guest for today's symposium is one of the few Filipinos who has combined professional training and experience in two important fields of any developing country's progress: agricultural banking and finance and agricultural operations.

He started as an Executive Trainee at Citybank for two years after having graduated with a Bachelor of Arts degree at Ateneo de Manila University. He went on graduate studies at the Ateneo Graduate Schools of Business in 1969, where he obtained his master's degree in Business Management.

His career in agricultural finance was launched after joining Robecon, Inc. as Finance Manager of its Agricultural Equipment Subsidiary. In 1971, he was named Vice-President for Finance of PMS Farming Corporation and Soriano Fruits Corporation. In this capacity, he had spent five years in agricultural finance. He also joined JBA Management Corporation as Executive Vice-President and Chief Operating Officer where he became involved in large-scale operations. From then on, his responsibility extended over its affiliate businesses involving a variety of agricultural products such as hogs, cattle, cacao, rice, coconut, ramie and others.

During his tenure when he was associated with sixty interrelated businesses in varying senior executive capacities, the firms enjoyed industrial pace, constant profit and steady growth. In 1982, he participated in Stanford Executive Program in Stanford University in California. It was then that he joined BPI as Vice-President for agricultural lending where he was instrumental in converting the Agri-Business Division into BPI Agricultural Development Bank, and was elected first president in December 1984. In March 1986, President Aquino appointed him Deputy-

Minister of Agriculture and Food and concurrently was designated to hold various agencies. He was then appointed Minister of Natural Resources in November 1986, which he held for almost four months only as he was then appointed Secretary of Agriculture by President Aquino on March 9, 1987.

Ladies and gentlemen, may I present Secretary Carlos Dominguez of the Department of Agriculture.

Secretary Carlos Dominguez. (*Secretary, Department of Agriculture*): Thank you very much.

My illustrious predecessor, former Agricultural Undersecretary and National Scientist, Dr. Dioscoro L. Umali, Dr. Paulo C. Campos, President of the National Academy of Science and Technology; my good friend and PCAARD Executive Director, Dr. Ramon Valmayor; UP Los Baños Vice-Chancellor Edwin Magallona; Dr. Perfecto Guerrero, President of the National Research Council of the Philippines; UP Los Baños Dean of the College of Agriculture, Dr. Ruben Villareal; Dr. Romeo Alcacid, Director of the Bureau of Animal Industry; Dr. Melecio Magno, Vice-President of the National Academy of Science and Technology; Dr. Jesus de Guzman of BAI; members of the Diplomatic Community, leaders in the fields of science, dairy farmers, supporters of the dairy industry, distinguished guests and friends.

I would like to make a small announcement first, and that is to announce that Dr. Romeo Alcacid has just been sworn in today as Director of the Bureau of Animal Industry. As Dr. Alcacid will tell you, the first official discussion we had which was around March 25 when he was appointed, we talked about how we can effect "White Revolution" here in the Philippines. I mentioned to him that it was truly sad that after so many years, the dairy industry had still been in a very underdeveloped state. Together, we decided that this indeed would be of highest priority in the Department of Agriculture.

This commitment was further enhanced in a little conversation I had yesterday with Director-General of the NEDA, Secretary Winnie Monsod. Winnie never lavish on anything, but yesterday she decided to come to me and insist that I continue the practice started by my predecessor, Secretary Ramon Mitra to continue the practice of delivering freshmilk to our house every week. In fact, she said, it was so good that she was willing to pay for it. So, I tell you the strategy of former Minister Mitra in giving out fresh milk to the Cabinet members has built for us a solid support and backing with them for this industry. So I have to ask Dr. Alcacid not only continue, but please step up the deliveries because there is a gathering of opinion in the Cabinet that we should support the dairy industry.

It is my privilege to be with this group of policymakers, academicians, practitioners, production processing and marketing groups, representatives of the government and private sectors who are not only knowledgeable but more importantly are concerned about the development of the dairy industry. The series of work-

shops held which culminate in today's symposium are clear indications of this concern.

I therefore would like to commend and congratulate the sponsors, the participants, the resource speakers, and the staff who made this all possible. It is in the spirit of concern for the development of a local dairy industry that I wish to forward the following short remarks.

Let me begin by saying something that you have heard me say already: The Department of Agriculture is now and shall continue to focus on the task of increasing farmers' incomes and improving their quality of life.

Let me be cleared that the Department is not and cannot be oblivious to the needs of the consumers. It is not as though the increased farmers income and lower-priced essential agricultural commodities were mutually incompatible or mutually exclusive. In increasing farmers incomes, we are simply reversing the trend during the past regime when the welfare of the farmers was sacrificed for the sake of the consumers. It is axiomatic of course that by increasing their incomes, we thereby give them sufficient reasons to be more productive. And if our farmers are productive, prices of their produce shall in the long run take a dip for the benefit of our consumers without sacrificing or affecting the profitability of farmers.

This general framework of our commitment to the growth and development of agriculture also holds true for the dairy industry. All efforts that we must undertake to rationalize its operations must begin by taking the point of view of our dairy producers.

As you very well know, we do not yet have an honest-to-goodness national dairy industry. What we have is a backyard dairy production industry that at the moment produces merely two percent of our animal dairy requirement. What we often refer to unthinkingly as our dairy industry is that which yearly drains our economy of almost \$72 million or about ₱1.5 billion because it imports more than 80,000 metric tons of assorted dairy products. This is what I would call our dairy re-processing or even just dairy repackaging industry that merely sells, or else repack and sells imported canned and powdered milk and other dairy products.

Another general agreement is that imported milk costs much less than locally produced milk. This is in financial terms, without regard to the economic cost of the imported products. Because of this lower cost, milk and milk products could be availed of even by the C & D income groups. Hence, this situation to a certain extent mitigates our malnutrition problem.

On the other hand, local milk production is almost insignificant, viewed in relation to consumption. I understand further, that there has been fluctuating volumes of milk produced locally as indicated by data on government-sponsored milk collection schemes such as the BAI, KKK, UPLB-DTRI program, and in cases of dairy farms being established then closing, then new ones being established again.

Furthermore, whatever local milk is produced is not utilized by the industrial milk plants. Most of the domestic production are sold in a variety of "fresh" forms

like milk, soft cheese, choco milk, confectionaries. Products of industrial milk plants, based on imported ingredients, on the other hand, are sweetened condensed milk, evaporated milk, milk powder, etc.

One wonders then what the government has done in this respect. We recall that as early as 1961, a dairy development law was enacted (RA 4041). I believe sometime after that then Undersecretary Dioscoro Umali was involved in another phase of legislation to support dairy. These laws pronounced as national policy the development of the industry. Some thirteen years later (1979), another dairy development law was passed. This was BP 21. Again, the same policy was affirmed. Subsequent to these laws, there have been programs and other activities.

Milk collection schemes have been organized; private dairy farms established, milk processing plants built; dairy upgrading projects, credit and financing schemes, and other programs to encourage and support dairy development activities have been formulated.

It is perhaps a sad commentary on the state of things that today, 1987, the overall conclusion about the local dairy industry is that it is still underdeveloped and to a large extent non-existence.

The workshops have identified the problems and the potentials for the industry's growth. Four specific points are worthy of serious consideration.

First: The current involvement of some 10,000 small-holder dairy producers in the different regions and provinces and barangays of the country. These are actual milk producers linked either to government or private milk collection schemes or selling milk on their own, directly to the consumers.

Second: There are government agencies already providing support to these efforts: The BAI's Dairy Development Division, the Philippine Dairy Corporation, the Kilusan Kabuhayan at Kaurilaran, the UPLB's Dairy Training and Research Institute and some state agricultural colleges.

Third: Government has invested considerable time, efforts and funds to these programs. We estimate that at present, at least ₱100 million is invested in animals, milk collection and chilling facilities, processing plants, dairy farms and other services, and

Fourth: There is an evolving partnership between government and private sectors in this area.

These are specific considerations which I feel are the more relevant ones of the present government policies, thrusts and programs. Under these circumstances, what do we in the Department of Agriculture wish to achieve for? Through the dairy industry, obviously, we should by all means try to cut down our imports and source our dairy requirements locally. Such an attempt though, will surely raise some problems. For one, we cannot really tell the Filipino people to make dough without milk and produce other dairy products while waiting for our backyard industry to expand sufficiently its operations and thus be able to produce enough to meet the national requirement, considering that all the industry has been able to

produce annually even with government incentives in the past. Two, in the almost three decades the production was a mere half a million liters. The prospects, therefore, don't seem very bright to say the least, and the industry can escalate its production within a decade to meet even just a 50 percent of the national yearly requirement of about 110 million liters of milk.

For another, we cannot disregard the milk re-processing industry's welfare just because we want to cut down the drain on our dollars. Although they merely repackaged imported dairy products, these so called milk manufacturers do employ among them a sizeable number of Filipino workers and professionals.

Imported milk at present costs less due to a large extent, to a subsidy program done abroad. This has enabled lower income groups to avail of milk and other dairy products. Nevertheless, the development of the industry must be done. We might as well throw overboard all our plans for nurturing our industry if we cannot be decisive on this core.

We need to gradually reduce our imports so that our producers could have every reason to escalate the scope of their operations. Human invention precisely thrives best on the basis of needs and on pressure. One who knows what he needs is half way in coming up with a mechanism for answering such a defined need. At the policy level, we need to re-define the feasible targets alongside with the salient constraint. In plainest terms, we have to undertake several actions. First, determine the attainable increase level of dairy production in the country, both on the short term and medium term.

We must be realistic in facing up to the need to maintain a minimum supply level of dairy products. They should be done jointly by all public and private organizations concerned with the status of the country's dairy industry. Second, we should arrive at a suitable package of incentives for our small-holder dairy producers so that they can meet if not exceed our requirements. We need to adapt mature dairy production technologies even as we provide our backyard raisers the technical training, marketing and financial back-up as well as sufficient support facilities to sustain their production efforts of course their profitability.

The Dairy Training and Research Institute and the reorganized Philippine Dairy Corporation should take a lead in this task. Third, we should formulate a complex of controlled mechanisms so as to gradually wane away our repackaging dairy industry from its total dependence on imported dairy products. This should serve as an accurate index of the production targets our producers will have to set and of course will have to meet. We should create a multi-agency Task Force to coordinate with our dairy manufacturers and at the same time to enhance the partnership between the public and the private sectors in this national efforts.

The sectors responsible for these imports are here in the symposium, so are the local producers. If these sectors can be brought together in one symposium, I do not see any difficulty in them. The local milk producers and the industrial milk processors should be together under longer term arrangements. This will be mutually beneficial and promotive of the national government's concern to be more self-

reliant in food and to save on much needed foreign exchange. The policy makers, implementors and technical informations support sectors to local dairy projects both government and private are here in the symposium.

Again, there will be little difficulty in bringing them together under longer term arrangements, which will make for more integrated and effective programs. The commercial and small-holders producing sectors are here. While the commercial sectors like the Magnolia and Aberden have always operated in an integrated fashion, they produced, processed and market their own milk.

I am happy to note that this integration of production, collection and marketing is also being undertaken by farmers groups like the Southern Tagalog Cooperatives, and the Sta. Maria Cooperatives. The beginnings of the integrated, viable and self-reliant dairy operations even among small-holder farmers are already in place.

I have studied your seminar/workshops outputs, and I'm impressed by the down-to-earth approach you have used in arriving at your recommendations. In fact, too many recommendations we received are conceived in ivory towers. Yours are more conceived in the dairy farms, and very realistic.

In production aspect, I agree essentially with the thrust you have outlined. We do need to adapt matured technologies to our needs from the use of milk replacers for calfraising, zebugrazing for dairy animals, use of better concentrate rations, use of zebu holstien crossbreeds and others. We do need to strengthen our research and extension services.

On the processing aspects, I agree with your two recommendations that: First, we organize our efforts to generate transfer and adapt suitable technologies, and second, to require milk processors to source their materials locally to the extent possible. It is my personal view that these efforts do not need that much government subsidies. However, should you by all means present us with the detailed proposal so that we can justify whatever government expenditures is necessary in this process, believe me, as I have mentioned earlier, support in the Cabinet is already there for our milk industry because they realized how important it is that this complete food be available to the poorest of our poor.

The recommendations you have made for improving the industry's marketing operations appear to be quite clearly dove-tailed with the recommendations you have made to improve production and processing system of the industry. And since you have the experts on these things, it should be incumbent upon you to crystalize further and flesh-out your recommendations.

I would like to see benchmark figures and well-defined indicators of viability. These figures should show: First, production benchmarks for given period; two, profitability benchmarks for producers, processors and marketing men; and three, cost analysis of both purely private and public projects as well as of collaborative programs and projects. I should perhaps add that we need a clearing house of information for the entire industry. Such a body would in effect be the industry's lead agency for fulfilling its mandate of coordinating, integrating and super-

vising the programs and activities of the different dairy development sectors. The need for such a body was dramatized at the last Agri-aqua Fair at PHILCITE when four dairy producers, two of them incidentally government agencies, sold their milk at ₱9.00, ₱11.00, ₱13.00 and ₱15.00 per liter.

I think a little bit of talking to each other is very necessary because, I don't see that milk quality will vary 40 percent in such a small group of people. In this respect, perhaps we could convene a Council which will monitor, review, coordinate, support and evaluate on-going and future dairy development programs and activities.

In the meantime, I would like to ask this group to cooperate in the working committee to prepare a plan of action and draft the needed legislation to be submitted to Congress for dairy development. The Committee will be composed of people from the private sector and people from the government, such as the PDC, the BAI's Dairy Development Division, the UPLB's DTRI, of course from the private sector, the industrial milk processors, commercial and small-holders, dairy producers, especially.

The Committee shall use the findings and recommendations of these workshops as a basis for the plan. As may associates in the Department know, I always like to boot a timetable and I would like to ask that the outpout of this Committee come out within, let's say sixty days, but I think, forty five days is enough because you have had lot of time to think about it already.

I wish to make it very clear that the Department is prepared to give its full support and cooperation. After all, dairy products are essential to the well-being of the Filipinos. I always like to say, "if other countries can do it, I think we can and we should". But while such support in principle for the industry is unconditionally, the material support can be anything but conditional. That is contingent of how will you can justify the public funds to be spent in this area.

As you know, our government is going through a very very difficult time. There are so many demands on the limited budget we have, but believe me, this particular program will require highest support and has already gotten support from countries like India. I believe, it can get support from other bilateral and other multi-lateral funding agencies. In fact, one of our problems in the Department of Agriculture is that the pipeline we have to Worldbank and Asian Development Bank is little bit low. And I think, dairy development can fit in very well there.

We have course in mind the mobilization of the private sectors entrepreneurial might. This is surely a reasonable expectation on our part even as you can reasonably expect us to look after the support facilities you need to keep your industry growing and your profits coming. Government investments in animal's handling, storage and facilities as well as pilot farms now, exceed the 100 million and it seems to me that the first task for you in this symposium should be to program the priv-

atization of some of these capital investments. We are prepared 100 percent to support efforts provided we can have good justification for them.

Again, I would like to say that one of the discussions I had when I returned to the Department of Agriculture as its secretary is to look at the dairy industry. Believe me, that will not be the last time I am going to talk about the dairy industry. This is of utmost important to us. We have with us here all the elements for a successful program, that in the long run, we can begin to eliminate our total dependence on foreign dairy industry. All of the thinkers and doers are here in this room today.

Please, then help me and help the rest of your country bring together a truly national and a truly responsive economic dairy industry. Thank you very much.

Dr. Jesus B. De Guzman (*Chief, Dairy Development Division, Bureau of Animal Industry*): Thank you very much Secretary Dominguez.

Well, we heard a very good, very encouraging pronouncements of our beloved Secretary of Agriculture. I fully believe, that it will fully strengthen the dairy industry from this time.

Now, we come to the next part of the program which is an Open Forum to be moderated by a very talented former head of the Plant Breeding Institute, a consultant of the Asean Vegetable Research Center and Development. He is also the concurrent dean of the Department of Agriculture, University of the Philippines at Los Baños, Dr. Ruben Villareal.

Dr. Ruben Villareal. (*Dean, Department of Agriculture, University of the Philippines at Los Baños*): Thank you very much Dr. de Guzman.

I will be giving the group an opportunity to ask a few questions, maybe five questions to our speaker. But before I do that, let me give a very brief thing about my sojourn in Taiwan. This is something very relevant to what we are doing in the Philippines, because at the time I was in Taiwan for eight and a half years, that was the time the economy of Taiwan was taking off. And one of these things they did was the establishment of cooperatives all over the country. I happen to be a participant in the cooperatives in the production of tomatoes for processing. And I think this is an ingredient which is very relevant also to what we are doing in the Philippines.

To make the story short, the success of Taiwan, according to economists, and scientists depends mostly on three very interrelated things. First of all according to them, is that Taiwan is now enjoying what we called US\$50 billion reserves for that small country and about US\$15 billion export credit. In other words, they earn so much dollar. Imagine, US\$15 billion just for income for excess and US\$50 billion for reserves. You could imagine that amount of money.

Why? According to the scientist and economist, the success of Taiwan are the following: First, discipline of the people. Second, sincerity of the government

I think everybody will agree with me that the sincerity of our government is there. And finally, Taiwan has been so successful because of the very strong political will of its government in implementing policies regardless of who gets hurt.

I assure, that if we can have these two components, the latter two, I think the fate of the dairy industry is already certain. Of course discipline is very much important.

With that introduction, I hope you are able to think of the question to ask our beloved Minister.

Thor Oreg (Manila Bulletin): I would like to address the question to the Secretary of Agriculture. What level of priority or rank does the Agriculture Department right now give to the dairy industry, because we have other priorities like fish, rice and other commodities? Could we have the ranking of the dairy enterprise?

Secretary Carlos Dominguez: Rather than rank it on that basis, I would like to say that the first and foremost priority in our government, is to make sure that our first priority is achieved — and that is the first priority to make farmers profitable.

In the past, there have been so many structures that have hindered the profitability of farmers. You can name the NASUTRA operations, the monopolistic coconut operations, the monopolistic fertilizer operations, the made imports, etc. We have been battling in the first year to try to eliminate these, so that the barriers to farmers profitability are opened. This is for farmers in general. We have not been successful in all. We still have a lot of work to do.

To give you an example, the fertilizer trade is not completely liberalized. We still have banning of imports on locally produced fertilizers, which is to the detriment of the farmers. We have other problems I did not mention earlier like agricultural credit. But we are trying to work that out. For the first time in five years, we have a viable plan of action. It may not be acceptable to all, especially people who have benefited from the past leniency in government policy, but in the long run, it will help increase viability.

When you look at the different sectors that we have, automatically you will start looking at the priorities primarily in the number of people who will be affected. When we talk of our priority production programs, I believe that it is in the dairy industry because it affects so many people not only the producers but so many consumers. It is really a very very high priority.

Benny Flores (DTRI): I would like to ask our Secretary that in the speech he had, a creation of a committee that will be composed of DLDC, DAI, DTRI, etc., and special mention of private and commercial industry on dairy, I would like to know if there is a place for the small farmers?

Secretary Carlos Dominguez: I said especially the small-holders. I mentioned that very very specially. It must be. They must have a very heavy representation there. And really, I think in the long run, our dairy industry in the Philippines will be small-holder based rather than large dairy forms. In fact, even in the United States, a lot of the dairy operations are small-holders by their standards.

You know, they are, maybe, a hundred or so animals, but you know, when you look at the skills of farming in the United States, it is really small-holder. Although they have more animals than we have, in their own skills of farming, that is small farmer operation. So, I think that will be the same here that it should be a small-holder based operation.

Francis Minalba. (UPLB Institute of Animal Science): Now, we have been using concentration source of our milk since 1960's, and now we have been using concentration newal crosses. That means that we don't know that the performance of these crosses does not reach our expectation. And that means that up to now, we don't have yet the breed of dairy cattle that we should use in the Philippines. I would like to ask the honorable Secretary if you are still agreeable of dairy research on this kind of field?

Secretary Carlos Dominguez: I don't think research should stop because I don't think you have an animal for all ages. I think you have to continually look for improvement in the genetic aspect next. I understand that the Brahamann holstein are good or better than the Sahiwal holstein. I am not really sure. I would just talking to some of the farmers and they seem to like that particular animal better.

There's gentleman here from India. I would like to ask him what is the breed that they use there.

Gentleman from India: We have quite a few breeds, and I think some of the breeds were brought there by Los Baños Institute. And by cross-breeding, I believe the milk yield has increased considerably, but the same breed could be continued in the future also.

Secretary Carlos Dominguez: Thank you very much.

So this genetic research is a continuing process and should never stop, but should be hastened.

Benny Flores (DTRI): We have problems in terms of priority. With your respect to Dr. Valmayor, we have given breeding or say breeding experiments of the different

researches a low priority. I hope this time we can open areas for this kind of experiment.

Secretary Carlos Dominguez: Well, its up to you to convince your funder to do it.

Dr. Ruben Villareal: We have heard from the Academe, from the press and also from a foreign consultant. And we hear from the farmer and from the other sector.

Rene Abad. (*Small cattle raiser from Camiling, Tarlac*): My question is: Can we have a choice of semen that will be available to the farmers? Let's say, can we have also some browns, flesh and some other breeds that can be used by the farmers?

Secretary Carlos Dominguez: I will ask Dr. Romeo Alcacid to answer that.

Dr. Romeo Alcacid: Actually, you should have a choice. Holstein Brahmans crosses may not also be a good performer in one region or the other. So I think you should have a choice depending in what area you are in. The more combinations we have, purely the better so we can have complete study on this.

Dr. Ruben Villareal: Dr. Valmayor would like to react on the previous question.

Dr. Ramon Valmayor: The national research system is updating the priority areas for research. In the past, we were community-oriented. The more important the commodity, the higher the priority, like rice and coconut, marine fisheries.

The new approach would be following closely the national development plans, particularly those developed by NEDA such as, import substitution or export generation. Now, all commodities that would fit, shall we say, import substitution would receive the same priority ranking whether it is dairy or rubber or any other commodity that would save dollars for the country, so you will have equal importance, equal chance of allocation for research in the new priority ranking that is being finalized.

Dr. Ruben Villareal: The chair will entertain one more question.

Virgelio Sagon (*Philippine Information Agency*): I remember one article of a local

journalist who said that “Filipinos, unlike the Chinese, are not good businessmen because they do not want to invest their own money”.

Talking about the privatization of dairy corporation, unlike in the past, the government always resorted to foreign funding or they invite foreign investors. In this case, Secretary or Dr. Magno, has mentioned about political will. Do you think there are enough Filipinos with political will willing to invest their own money to develop the dairy industry?

Secretary Carlos Dominguez: Let me answer that. I was in Bicol last Sunday looking at the drought situation. I was very surprised to meet Mr. Gaité there, who told me that he was really interested in going into the dairy industry in Bicol. Mr. Gaité is a chicken farmer. I think it's not really true that Filipinos do not want to invest their own money. I think one of their problems is that they do not have enough money to invest.

But there are people who have taken the risk, and who have done well in the dairy business. There are many people who have done not so well either, but, I think there are people who recognized that there is a market, and that there are profits to be made. These gentlemen from Sta. Maria, are good examples of people who are willing to put in their time, energy and money into meeting those demands and making a profit in the meantime.

Mrs. Gomez: I have a question for the honorable Secretary: May we know the mechanism for activating the proposed working committee?

Secretary Carlos Dominguez: I think, it would be best left to the director here to determine how he will put it together. I think, initially, it can be housed under Livestock Development Council (LDC) to start with. Anyway, LDC is the agency that involves both public and private. I suppose you can activate that committee there. So, I will leave it up to him to put it together.

Dr. Romeo Alcaid: The Livestock Development Council is composed of the private and the government sectors and the academe. In fact, we have created a committee mainly on the poultry, and poorly we can do the same for the dairy industry. We hope we, with Dr. Aglibut and the rest of the group can meet after this, and discuss how we can go about forming this.

Dr. Ruben Villareal: Dr. Paulo C. Campos, the President of the National Academy of Science and Technology would like to say a few words.

Dr. Paulo C. Campos (*President, National Academy of Science and Technology*):

As the President of the Academy, we have discussed this problem quite a lot. And it is our considered opinion that this is very vital to the country, and it is something we have been missing completely.

I think so many things have been said before me. I just want to point out a few other things that have been missed: One, that the milk we are consuming right now is poor quality milk. It is not even consumed in countries that are exporting them. That's suppose to be only for animal feed. They don't consume this type of milk. Secondly, many of these things that are peddled around are just parts of the milk and then they add other components and peddle it as milk, which is a deception.

As a scientist and as a medical man, we are very concerned with this. Because in our country, our main problem is nutritional deficiency, mostly uprooting. We are not getting hungry because there's a lot of rice. But there is a lot of nutritional deficiency in this country. And the single most important answer to that problem is to teach our people to consume milk and to produce milk.

The other thing is that we are all aware there is a lot of unemployment in this country. We are trying to create jobs. Here is a golden opportunity for employment in the countryside, but it has never been given much consideration. We are all fully aware that all the ingredients necessary for this industry are in this country. We have the resources: we have the land that is lush with vegetation, we have the people, we have the knowhow.

As was mentioned by Dr. Villareal, there are some ingredients that are lacking in that mix. We in the Academy feel that it is a lack of national will. And we look at the dairy industry as a test of that national will. If this country cannot even put up a viable dairy industry, we have reason to be a little pessimistic about the future of this country. For so important an industry to ask, and so vital to our needs and we cannot even get together and put up the industry.

The market is here. We don't even have to export it. Our government is trying hard to look for export markets where here is an industry where the market is here. There was a question about private capital going in. I think private capital would be going in if they can see that that the industry would be profitable for them. But if there is no market because that market is being crowded out by these imported substitutes for milk, I can understand the reluctance of farmers to go into the industry.

Now, I think the government has tried and again, and has signified its intention to put up the industry but it is not taken off so far. I am very familiar with the Sta. Maria project. Many years ago I was visiting this area because we try to put up our own cooperatives.

I have the feeling that the government should also take a good look instead of approaching the problem of putting up the industry from the corporate viewpoint. Possibly, they can take a second look and look at it from the countryside viewpoint. This has succeeded in many countries. I have invited Indian representatives because we all are aware of how successful the dairy industry in India has

been. And it is based on small farmers, on cooperatives. I see no reason why the Philippines cannot duplicate the Indian experience considering that we are only 54 million. The Indians are almost half a billion. We also consider ourselves at least a the same literate level as the Indians.

Dr. Perfecto Guerrero: At the close of Workshop II on "Support Systems for the Dairy Industry", I was given an opportunity to voice out a few remarks. At that time, I made the observation that a series of workshops, first on "Status, Problems and Issues", second on "Support Systems" and finally on "Government Thrusts and Programs". To my mind constituted vital and essential steps in conducting what is known as "Technology Assessment" type of study on the Philippine dairy industry.

As far back as early 1985, the National Science and Technology Authority has been considering technology assessment as a special scientific activity in view of the failures of past government projects perhaps due to faulty implementation to lack of foresight in the planning of these projects or the failure to recognize concomitant effects were unintended and unwanted.

Technology assessment has its beginnings in the United States in the early 60's. The United States Congress conceiving of technology assessment as a sort of early warning system designed to control, direct or if necessary to curb technological activity by identifying second order, third order and high order effects of a technology.

In many instances, technology, the benefits of a technology have been found to be concentrated only in the user of the technology. But its costs and risks in terms of social and environmental problems and more far-reaching and the diffuse to a large number of people who do not even share directly in the benefits thereof.

Now, while technology assessment as the name implies, may be directed to technological activities like production of energy, building of roads and other infrastructures and others, the generally accepted view of what is technology is that it is any device or system. It may be physical, biological, social or economic that is employed to address the needs of man. And in this broader concept, you are actually doing a technology assessment of a socio-technical system which is the local dairy industry. You have been identifying existing problems of the industry, you have been looking into the causes of these problems and proposing recommendations and strategies for addressing the problems.

We in the National Research Council of the Philippines always felt that being engaged, being collegial bodies, drawing our memberships from the vast portion of the population known as the Science Community, we are in a good position to conduct or to pursue or support technology assessment studies.

During the workshop in Bicutan, I invited the organizers of these multi-sectoral conference to consider the advisability of formal technology assessment report based on the results of the conference for submission to government and the business sector, hinting then that the National Research Council of the Philippines will consider support for the preparation of such a report.

Last week, Dr. Franklin Aglibut, the director of the Dairy Training and Research Institute took up the challenge and wrote me officially about a proposal for producing a State-of-the Art series on dairy production and technology. I intend to send the reply to him conveying the interest of the governing board and to invite him for further dialogue on the matter.

I think that the most significant accomplishments of the three workshops conducted last year, the proceedings of which are embodied in a three-volume report is the generation of the needed data based on the status of the industry, and the presentation of recommendations and strategies for its full development.

As far as technology assessment is concerned, would say 75 percent of the work has already been done. And what we need to do now is to identify what still remains to be done if we are to produce an integrated and comprehensive report that can be used by decision-makers in government, in business and industry.

Perhaps you should study a scheme of establishing priorities among the recommendations we have presented. It is easy to submit a list of recommendations on what needs to be done in order to achieve a certain goal. The government will accept these recommendations but will probably scratch its head on how they should be implemented, how much emphasis to be placed on each item of the recommendation and when to do it in order to attain the desired goal within a set period of time.

Prioritization, programming, scheduling, balancing allocation of resources and evaluation of these will be the headache of the government. It would be ideal if you can fine tune somewhat the recommendations you made in order to make them more pragmatic, more affordable, more realizable. But what is important is socially acceptable. I know that this can be a Herculean job considering that the system that we are analyzing is a socio-technical system with its complexity of determinants and variables which could be technical in nature, social or even political. Or since we are all mostly people involve in R & D, perhaps we can zero in on a smaller area of the problem such as the R & D aspects of dairy production and manufacture, concentrating on the technologies involve in production and recommending those needed for further R & D or for immediate commercialization.

In this regard, let me mention that the R & D work of one of the scientists among you, and incidentally the regular member of the National Research Council of the Philippines that is Dr. Claire Davide reach the attention of President Corazon C. Aquino during the 54th Annual Meeting of the NRCP held at the PICC last March 14. The President actually tested a sample of the cheese made by Dr. Davide who named it after the President as the Cory Blue Cheese. Many of you were not there but I distinctly heard the President remarked that she like it very much and that a sample of its should be sent to her daughter Bulsy who is a lover of cheese. And if the Secretary were still here, I would suggest that in addition to the daily supply of milk to the members of the Cabinet, they should include the supply of the Cory

Blue Cheese, because we have already made a breakthrough as far as that body is concerned.

Now, in the National Science and Technology Authority (NSTA), you will be happy to note that there is a new institute called Technology Application and Promotion Institute or TAPI which will be created in accordance with Executive Order No. 128, (the reorganization of the National Science and Technology Authority), patterned after the successful KETAC of South Korea. The acronym stands for Korea Technology Application Corporation.

The new institute which will later be converted into a corporate status will serve as implementing arm of the NSTA in promoting the commercialization of technologies including marketing. In summary, what I would like to say is that while you had accomplished a tremendous lot of valuable results during these workshops, including during this morning symposium, there still much more work to be done as emphasized by Secretary Dominguez which calls for continued and dedicated work and unselfish cooperation among all those involved, and ask before I pledge the cooperation of the National Research Council of the Philippines.

Dr. Jesus B. De Guzman: That is the end of our symposium, and I would like to thank everybody for your persons for this very memorable, very successful symposium which will lead to the strengthening of our local dairy industry.

Thank you very much.