

Round Table Discussion
National Academy of Science
and Technology
January 27, 2014

"The Emerging Challenges/Needs of
Microbiologist of the Food Industry"

Outline

- Expectations
- Roles and Responsibilities

- Needs and Challenges
 - ✓ Technical Requirements
 - ✓ Non-Technical requirements

- Recommendations

- Expectations from a plant microbiologist.

- The multifunctional roles of microbiologist in the food and beverage industry.

Assumptions – Basic and Applied Microbiology

Roles and responsibilities:

- QA/QC checks and analysis
- Generate and provide information on the quality of raw materials and products
- Decision to accept/reject raw materials and finished products
- Conduct process and product monitoring

Roles and responsibilities:

- Involved in the planning, controlling and implementation of activities.
- Spearhead control of unwanted microbial growth in various parts of operation.
- Assess the cleanliness of process and facilities.

- Assess effectiveness of the method of food treatment and sanitation.

- Participate/lead in troubleshooting activities such as problem analysis, identification of root causes.

- Recommend immediate and long term corrective and preventive measures.

Needs and Challenges

Technical Requirements

- Chemistry and Biochemistry
- Hygiene and Sanitation
- Engineering and Packaging Sciences (food safety and sanitation)
- Research and Development
- Sensory Science
- Environmental Science

Needs and Challenges

Non-technical

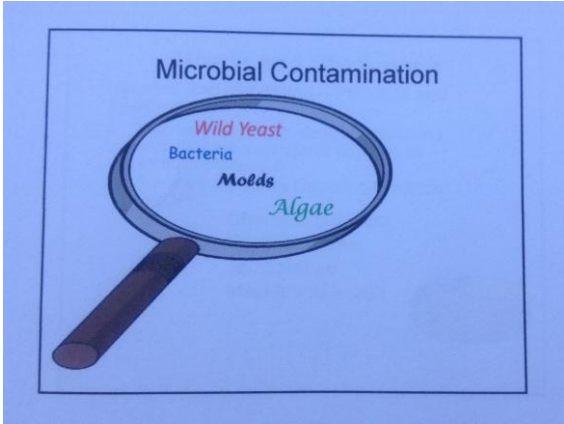
- Soft Skills
- Business Sense
- Work Ethics

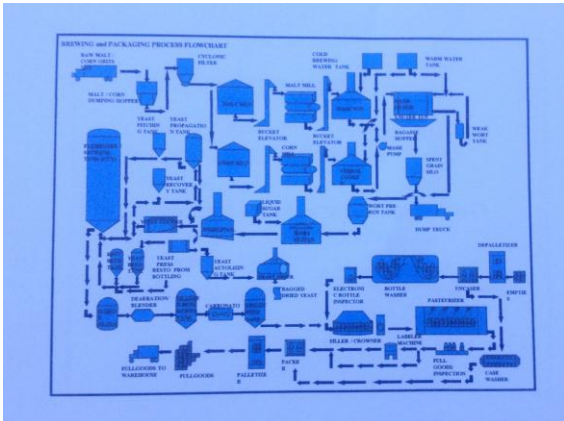
Traditional and Conventional Microbiological Analysis

- Sampling and Plating for TPC, HPC, TVC,
- Microscopic exam
- Staining
- Biochemical test

- Raw materials
- In-process samples
- Packaging materials
- Finished products
- Utilities

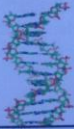







Needs and Challenges

- Chemistry and Biochemistry
 - Growth requirements of culture microorganism and contaminants
 - Active components, mode of actions of cleaning and sanitizing chemicals



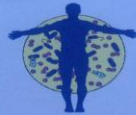
Needs and Challenges

- Hygiene and Sanitation – Principle and Application
 - Establishment of physical, chemical and microbiological standards covering all areas of production
 - Standard Sanitation Operating Practices (SSOP)
 - Chemical cleaners,
 - Exposure Time,
 - Temperature,
 - Mechanical action



Sanitation Control Program

- Cleaning, disinfection, preservation and sterilization of food and food-contact facilities.
- Aseptic and sterile processing (MF, RO, UF, Pasteurization, Chlorination, Ozonation, UV)
- Personnel hygiene

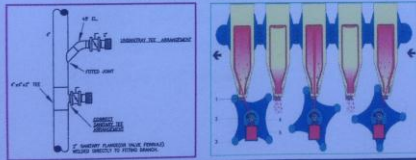


Needs and Challenges

- Engineering and Packaging Sciences (direct or indirect impact on the food and processes)
 - Generation of utilities (compressed air, steam, refrigeration, water treatment)
 - Solid materials as stainless steel, sanitary valves, packaging materials, sterile filters, machine operation, etc

Needs and Challenges

- Engineering and packaging Sciences
- Design of equipment, facilities, pipelines and machines as they affects the cleanability and impact on the production and products.



TOFTEJORG Tank Cleaning Equipment Type TZ-74

This TZ-74 rotary jet lance uses both water, ultrasonic and steam clean conventional cleaning methods. It is high speed, durable and proven for the cleaning tank.

Specifications
Rotary jet lance with ultrasonic tank clean nozzle. Operates at 1200 RPM. Operates at 1200 RPM. Operates at 1200 RPM.

Operation
The TZ-74 rotary jet lance uses the nozzle pattern to clean the tank. The nozzle pattern is designed to clean the tank. The nozzle pattern is designed to clean the tank.

Advantages
A variety of nozzle patterns, ultrasonic cleaning and steam clean. For cleaning spray configurations. Advantages: Operates at 1200 RPM.

Mounting
The TZ-74 is designed for easy installation in the tank. The TZ-74 is designed for easy installation in the tank. The TZ-74 is designed for easy installation in the tank.

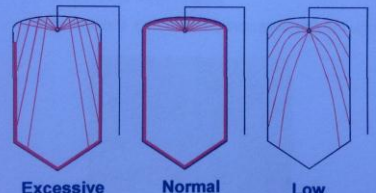
Cleaning Information
The TZ-74 is designed for easy installation in the tank. The TZ-74 is designed for easy installation in the tank. The TZ-74 is designed for easy installation in the tank.



Specification	Value
Weight	1200 lbs (544 kg)
Height	1200 mm (47.2 in)
Width	1200 mm (47.2 in)
Depth	1200 mm (47.2 in)
Max. Tank Diameter	1200 mm (47.2 in)
Max. Tank Length	1200 mm (47.2 in)
Max. Tank Volume	1200 m ³ (42465 cu ft)
Max. Tank Pressure	1200 psi (82.7 bar)
Max. Tank Temperature	1200 °C (2160 °F)
Max. Tank Material	1200 mm (47.2 in)
Max. Tank Thickness	1200 mm (47.2 in)

Vessel Cleaning

Pressure (and flow) at the sprayball:



Needs and Challenges

- Research and Development
 - Design and conduct of lab-scale and pilot scale trials
 - Set of parameters, evaluation of results, statistics
 - Product development
- Process Improvement

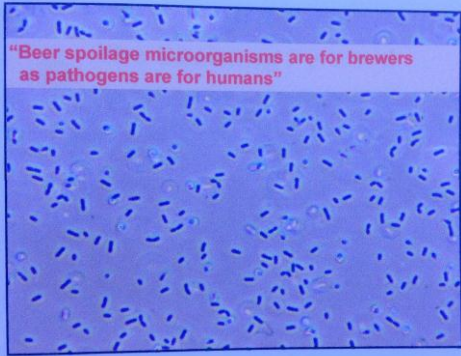
Needs and Challenges

- Sensory Science
 - Effects of microbiological metabolism on sensorial profiles (taste, aroma, flavor, visual)
 - Generation of gases, volatile compounds, changes in pH and physical appearances
 - Aesthetics of products and packaging materials


Critical for both food and beverages :

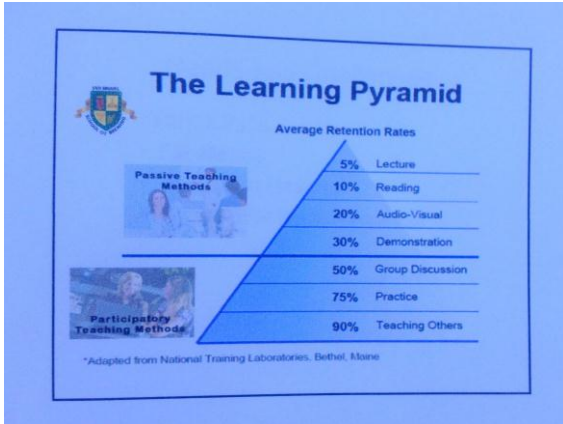
- Infections affect flavor
- Infections can affect beverage presentation





- ### Needs and Challenges
- Environmental management
 - Water and Wastewater Treatment
 - Effective waste treatment and disposal
 - Quality of effluent
 - Management of sludge
 - Unwanted growth of algae

- ### Needs and Challenges
- Teach / Mentor
 - Inform/communicate with different levels of organization from top management to line operators
 - Teach and train staff and other personnel
 - Food Safety, cGMP, HACCP, GMP, LMS,
- 



THE INTERMEDIATE BREWING COURSE
Nat. F. Ass. 15, 2008, 1800 Recognition Course, Pilot Brewery

A brewing course aimed at providing the participants with comprehensive knowledge of the brewing process, the dynamics of brewery operations and socio-economic issues affecting the industry.

Within the span of this course, the participants will gain a level of industry knowledge that will benefit them in every area of responsibility in the brewery, covering every topic critical to successful operations.

This is an ideal course for those brewers who have worked for at least a year in San Miguel, as well as those pursuing a wider knowledge of the business in order to improve their contributions and advance in their brewery careers.

Ideal also for those in Brewery Engineering and Packaging who want to gain a more comprehensive understanding of the brewing process.

Each module specializes in each competency area of brewing technology.

Course Content

- Contemporary Issues
- Brewing Raw Materials
- Wort Production
- Process & Fermentation
- Fermentation and Maturation
- Filtration and Bright Beer Operations
- Quality Management
- Packaging Operations
- Quality Management (GMP/HACCP)
- Food Safety Technologies
- Brewery Engineering
- Sensory Science and Evaluation
- Real Beer Management
- Environmental Management

Application

Please communicate in writing to Ms. Soc Marcelo not later than May 15, 2008. Early enrollment is recommended, as numbers are limited and will work on a "first come-first serve basis".

San Miguel School of Brewing
where brewmasters are made...

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Needs and Challenges

- Business Sense
 - Financially adept
 - CAPEX, Budget, ROI
 - Enercon

Needs and Challenges

Work Ethics

- Excellence
- Dedication (Malasakit)
- Concern for the Environment

Recommendation

- Prepare students to be industry ready
- Updates on latest technology
- Auditing skills
 - Man,
 - Machine,
 - Materials,
 - Methods
 - and Environment

THANK YOU



CHEERS!
