Towards HACCP
Hazard Analysis + Critical Control Points

Preventing a problem rather than solving it when it has happened
Why HACCP

• Assure safety of consumers
• Financial: Reduce wastage
• Image: Meet consumer demands
• Meet regulations
Doing things right

- Always strictly controlling all the steps
  - Higher quality
  - Less problems
  - Less spoilage
  - Less consumer complaint
- GAP: Good Agricultural Practices
- GMP: Good manufacturing Practices
- GHP: Good hygiene practices
Basic hygienic production

• Clean water
• Clean equipment and utensils
  • Metal mixing spoon
• Use of liquid soap
• Hand washing
• Clean clothing
• Shelter for kitchen
• Packaging room: smooth surfaces
The most critical steps in yoghurt making

- The milk should not have antibiotics
- The yoghurt should not have contaminations (cow hairs, ash, dust, others...)
- Heating should be long and hot enough
- Every time after cooking you expose the milk/yoghurt, the shelf life decreases.
- Store yoghurt at 2 - 5 °C, max 10 °C during transport
- Keep preferably for 24 hours in the fridge before transport and sales: thickness increases
Yeast

• Main danger: Yeast and moulds from the air. Yeast and moulds are present in high numbers on surfaces. On the skin of one person, $1 \times 10^{11}$ bacteria are present!!!

• Cause gas production (bulging of packages)

• Use cleanable equipment, utensils and surfaces.
  • Boiling water
  • JIK (bleach)

• Avoid ventilation

• Avoid any contact with the air as much as possible!!!
Controlling the process

• If you test the end product, it is already too late... Control the process!
• Mistake that is a danger to health and safety of the customer: Critical Control Point (CCP)
• Mistake that makes poor quality yoghurt: Control Point (CP)
• Set targets for the CCP’s and the CP’s to see if they are under control
• Set corrective actions
Hazards

• Different types of hazards:
  • Biological: bacteria, yeast
  • Physical: cow hairs, ash, dust
  • Chemical: detergents, antibiotics

• Danger to safety and quality

• Assure absence at point of consumption
Hazards come from...

• In raw material (milk, sugar, packaging material)
• During process
  • Environment
  • Equipment
  • Personnel
• Hazards that survive (not enough heating)
Hazard analysis

- The likelihood and consequence of micro-organisms present.
- Floor plan with potential routes of cross contamination
- Vulnerability of consumers
Floor plan

- Milk reception
- Pasteurization
- Fermentation
- Packed yoghurt
- Packing
Yoghurt production process

1. Raw milk (cooler or can)
2. Pasteurization
3. Cooling and adding starter
4. Fermentation
5. Packing, storage, distribution
## HACCP plan yoghurt production

<table>
<thead>
<tr>
<th>Step</th>
<th>Type</th>
<th>Prevent</th>
<th>Target</th>
<th>Check</th>
<th>Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Raw milk</td>
<td>Microbial</td>
<td>Train farmers on hygiene</td>
<td>CP</td>
<td>Observe farm practices</td>
</tr>
<tr>
<td>1</td>
<td>Raw milk</td>
<td>Antibiotics</td>
<td>Inquire from farmer</td>
<td>CCP</td>
<td>Absent</td>
</tr>
<tr>
<td>1</td>
<td>Raw milk</td>
<td>Impurities</td>
<td>Filter</td>
<td>CCP</td>
<td>Absent</td>
</tr>
<tr>
<td>2</td>
<td>Pasteurization, milk and sugar</td>
<td>Microbial</td>
<td>Temperature and time</td>
<td>CCP</td>
<td>85 °C, 15 min</td>
</tr>
<tr>
<td>2</td>
<td>Pasteurization</td>
<td>Microbial</td>
<td>Cleaning</td>
<td>GMP</td>
<td>Hold in boiling water</td>
</tr>
<tr>
<td>2</td>
<td>Adding sugar</td>
<td>Impurities</td>
<td>Dissolve and filter</td>
<td>GMP</td>
<td>No visual impurities</td>
</tr>
<tr>
<td>3</td>
<td>Cooling</td>
<td>Microbial</td>
<td>Temperature</td>
<td>CCP</td>
<td>45 °C</td>
</tr>
<tr>
<td>3, 4, 5</td>
<td>Cooling and fermentation and packaging</td>
<td>Microbial</td>
<td>Keep covered, use clean equipment</td>
<td>CCP</td>
<td>Covered, put equipment in boiling water</td>
</tr>
<tr>
<td>5</td>
<td>Storage, distribution</td>
<td>Microbial</td>
<td>Temperature</td>
<td>CP</td>
<td>4 °C</td>
</tr>
</tbody>
</table>
Verification

• Lab test
• Consumer complaints
• Work instructions well communicated: Everybody follows the correct production procedure and hygiene measurements
• Records of milk quality and spoilage rates.
• Review the procedure in case of new type of product/new production site/new equipment/packaging
• In case of poor quality/failure/consumer complaints
  • What is the cause?
  • How to prevent it from happening again?
Simple improvements to the production process

To minimize contaminations
Sources of contamination

• Raw materials
  • Dirty or old milk will bring out low quality yoghurt

• Utensils/ Equipment (tables, cardboards, covers/lids, pans, cans, buckets, stirring stick, etc.)

• Environment (design of the unit, storage conditions, water, temperature and air)
  • Be careful with the water used for cleaning!

• Personnel skin and clothing
Sources of contamination

• Additives (sugar, flavors, stabilizer, fruits)
  • Sugar needs to be boiled together with the milk!!
  • Keep the lid of flavors and other additives (stabilizer etc) closed!

• Packaging materials and packaging method
  • Sometimes its needed to clean bottles
  • Don’t enter with your hands into the buvera

• Soil and drains
Simple improvements in the production process

• Strictly use metal utensils
Essential equipment
Prepare yoghurt from tightly closed cans, and not on direct fire
Prepare from smooth surfaces
Walls

- Smooth
- Bright colored
- Cleanable
Smooth ceiling to prevent dust and contamination

- Ceiling should be high enough
Floors

- Made of material (cement, concrete, terrazzo or tiled) that is easy to wash and dry
- Drainage systems should be kept clean
General guidelines

• Enough light, either natural or electricity
• Don’t expose sockets to water
• Proper ventilation
• No windows near dirty places
• Enough dustbins
• Dustbins in appropriate places
• Enough water for washing hands and utensils
• Toilets available
• Change into clean clothes and clean shoes when entering (changing room)
Wear appropriate clothing and cover hair
Clean & Safe At Work

Checklist:

- Wear Your Head Cap
- Wear Your Mouth Mask
- Wear Your Smocks
- Wear Your Gloves
- Wear Your Coat
- Wear Your Safety Shoes

Ready? Now You Can Start Working
Personal Hygiene

• All staff members should be medically examined every six months
  • Diseases that are transferable in food
• Do not work if you suffer from flu, vomiting, diahoerrea or any related disease
• Hand washing: all the time, after toilet use, using soap
• Protective clothing: clean clothes, only used inside
Make a plan

<table>
<thead>
<tr>
<th>What</th>
<th>When</th>
<th>Who</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buy plunger</td>
<td>August</td>
<td>Chairman</td>
<td>200.000</td>
</tr>
<tr>
<td>Attend DDA training school Entebbe</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>