# Food Processing Workshop – Dairy Processing

## 1. Yoghurt

### Material:

- Incubator @45 °C
- Pot and stove
- Thermometer
- Stirrer
- 2 l pasteurized milk, homogenized
- • 250 g of plain yogurt without fruit additives (Lactobacillus bulgaricus and Streptococcus thermophilus)
- • 15 sterile yoghurt cups

### Tasks

Produce the yoghurt

### Methods:

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| Heat the milk to 40-45°C. |
| Inoculate the milk with 250 g of the plain yogurt and stir it in. The upper portion of the plain yoghurt may have unwanted microorganisms, therefore skim the top |
| Fill the mixture into pre-warmed jars and seal them. |
| The yogurt matures at 45°C in an incubator, a warm water bath, inside an insulated box, or in a yogurt maker for 3 hours until the pH reaches 4.6 |
| Storage:<br>Store the yoghurt at 4 °C. It will will continue to ferment in the refrigerator |
| Shelf life:<br>With proper hygiene and pasteurized milk yoghurt can be stable for months as it is pasteurized and its pH is below 4.5 |

The most common bacteria used for yoghurt are:

*Lactobacillus bulgaricus*
Optimal pH: 5.5-6.2, Optimal Temperature: 40-46°C

*Streptococcus thermophilus*:
Optimal pH: 6.2-6.6, Optimal Temperature: 42-46°C

*Lactobacillus acidophilus* (mild flavour):
Optimal pH: 5.0-6.0, Optimal Temperature: 35-45°C

*Lactobacillus casei* (used for probiotic yogurt):
Optimal pH: 6.0-7.0, Optimal Temperature: 37-42°C

## 2. Cream Cheese

### Material:

- Pot and Stove
- Thermometer
- Water bath
- Cheese cloth
- Colander
- Hand mixer
- Metal container
- Packaging
- 1 liter whole milk, un-homogenized, pasteurized
- Cultured buttermilk
- 2 ml rennet extract (1 ml rennet, 9 ml water)

### Tasks

Produce the cream cheese

### Methods:

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| Acidify: Heat the milk to approximately 36°C and stir cultured buttermilk into the milk. Place it into a water bath (38-40 °C) to keep the milk at approximately 36°C and allow it to acidify for 60 minutes |
| Curding:<br>Add 2 ml rennet extract and stir gently for an even distribution and let it thicken for about 30-45 minutes. Cut the curd into 50x50 mm cubes and let the curds settle for approximately 15 minutes |
| Draining:<br>Transfer the curds into the cheese cloth and colander using a ladle. Drain until the desired consistency is achieved |
| Whip the curds with the hand mixer and season to taste with salt or herbs and pack it into a sterile container |
| Storage and shelf life:<br>Store the finished product at 4°C. It shall be stable up to 4 weeks as it is pasteurized and |

## 3. Mozzarella

### Material:

- Pot and Stove
- Thermometer
- Water bath
- Slotted spoon
- Cheese cloth
- Colander
- Packaging
- 3 liter whole milk 3.8 % fat, un-homogenized, pasteurized
- Citric acid, 10g
- 2 ml rennet extract (1 ml rennet, 9 ml water)
- Salt, non-iodized table salt, 1% (W/W) of the weight of the cheese curds
- Ice bath

### Tasks

Produce the mozzarella

### Methods:

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| Heat the milk:<br>Pour the fresh milk into a large pot and heat it to around 32°C. Use a thermometer to monitor the temperature. Once the temperature reached 32 °C transfer the pot into the water bath (34-36 °C) |
| Acidify:<br>Dissolve 10 g of citric acid in 50ml of water and stir it into the warmed milk. Stir gently until the milk starts to separate, with solid cheese curds separating from the whey |
| Add rennet:<br>Introduce 6 ml diluted rennet solution into the milk mixture. Stir gently to ensure even distribution of the rennet. Let it sit for 10 minutes at 32°C. |
| Cutting the curds:<br>Once the whey becomes clear and separates from the solid cheese curds, cut the cheese into 2 cm big cubes and heat it up to 45 °C to set the curds for three minutes while gently stirring. Use a slotted spoon to transfer the cheese curds over to the cheese cloth and colander to seperate the whey from the cheese curds. |
| Knead the cheese:<br>Knead the cheese in the cheese cloth, removing excess whey, and form layers. Season it with 1% salt according to the cheese curd weight. If the cheese curd is to brittle pour some 85 °C hot whey over the cheese curds and continue folding and kneading |
| Form and cool the cheese:<br>Thoroughly knead the cheese to ensure it's smooth and even. Shape it into small balls and immerse it in cold water to cool and set. |