

Yoghurt Processing: Food Security and Shelf Life

Yoghurt is a widely consumed fermented dairy product known for its nutritional benefits, extended shelf life, and versatility. This presentation explores the production process, food safety measures, and shelf life considerations.



Materials and Equipment

Equipment

- Incubator @ 45°C
- Pot and stove
- Thermometer
- Stirrer
- 15 sterile yoghurt cups

Ingredients

- 2 L pasteurized, homogenized milk
- 250 g plain yoghurt (with starter cultures)

Yoghurt Production Process

1

Heating the Milk

Heat milk to 40–45°C, the optimal temperature for bacterial growth.

2

Inoculation

Add 250 g plain yoghurt as starter culture. Stir thoroughly, skim off top layer.

3

Filling and Incubation

Fill pre-warmed sterile jars, seal, and incubate at 45°C for 3 hours.

4

Cooling and Storage

Refrigerate at 4°C to slow fermentation.





Food Safety in Yoghurt Processing

Pasteurized Milk

Eliminates harmful pathogens that could compromise safety during fermentation.

Controlled Fermentation

Maintaining 45°C ensures optimal bacterial activity while preventing spoilage organisms' growth.

Aseptic Techniques

Skimming off top layer prevents contamination from airborne microorganisms or surface bacteria.

Critical Control Points (CCPs)

Proper cleaning, sterile conditions, and pH monitoring ensure microbiological safety.



Shelf Life of Yoghurt

Unopened Shelf Life

Several weeks to months due to low pH (<4.5), inhibiting spoilage organisms.

Opened Shelf Life

7–10 days when stored at 4°C to maintain freshness.

Influencing Factors

- Hygienic processing
- Proper sealing
- Consistent cold storage

Role of Starter Cultures

Bacteria	Optimal pH	Optimal Temperature (°C)	Contribution
Lactobacillus bulgaricus	5.5–6.2	40–46	Produces lactic acid; enhances flavor
Streptococcus thermophilus	6.2–6.6	42–46	Initiates fermentation; improves texture
Lactobacillus acidophilus	5.0–6.0	35–45	Provides mild flavor
Lactobacillus casei	6.0–7.0	37–42	Used for probiotic yoghurts



Food Security Considerations



Nutritional Value

Rich in protein, calcium, vitamins, and probiotics for gut health.



Microbiological Safety

Fermentation inhibits pathogenic bacteria through acid production.



Long-Term Storage

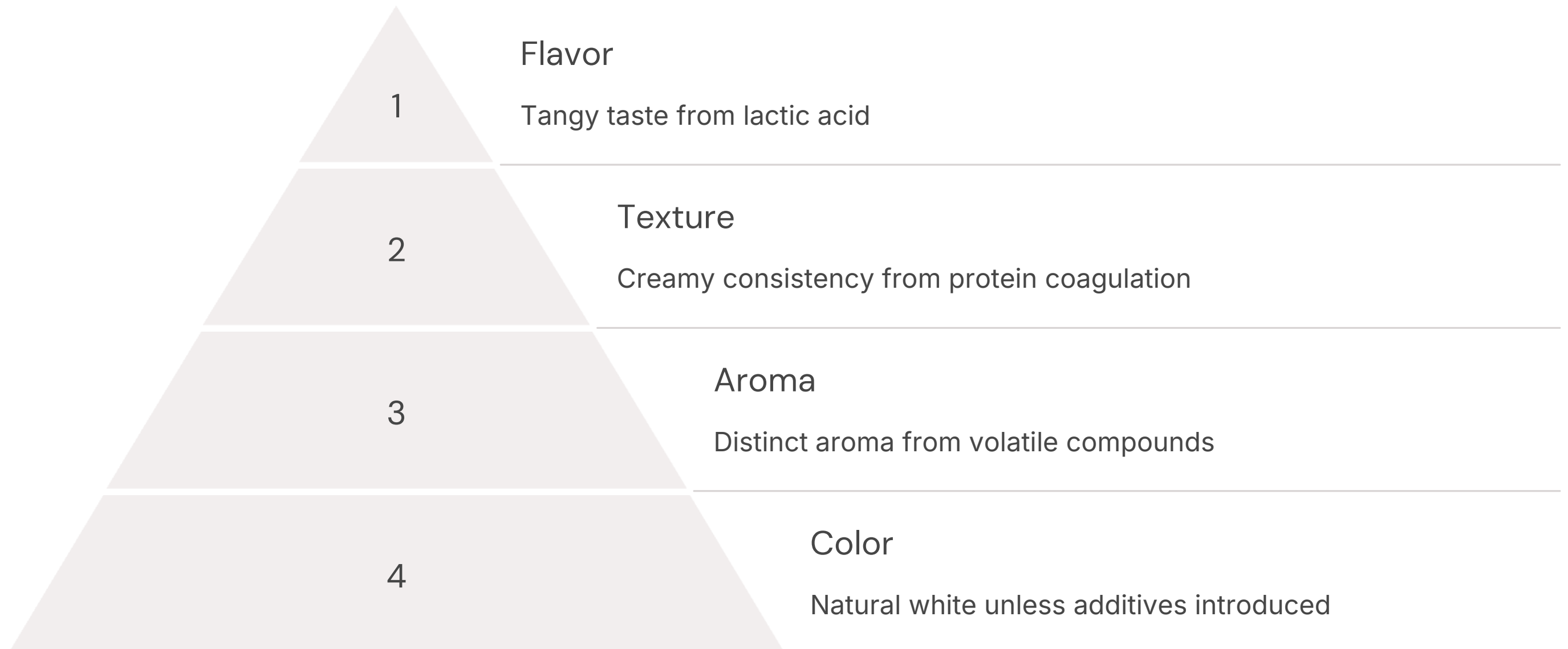
Low pH ensures extended shelf life without preservatives.



HACCP Implementation

Identifies risks and provides corrective actions for safe products.

Sensory Characteristics



Key Takeaways

1 Food Safety

Pasteurization, aseptic techniques, and controlled fermentation are critical.

2 Shelf Life

Low pH ensures stability for weeks under refrigeration when unopened.

3 Starter Cultures

Optimize texture, flavor, and microbial safety.

4 Nutritional Benefits

Nutrient-dense food supporting gut health through probiotics.





Spoilage Risks

1

Contamination

During processing or improper handling

2

Improper Storage

Incorrect temperature or exposure to air

3

Microbial Growth

Leads to off-flavors and texture changes

Enhancing Food Security

1

Extended Shelf Life

Reduces food waste

2

Nutritional Value

Provides essential nutrients

3

Probiotic Benefits

Supports gut health

4

Versatility

Adaptable to various diets

Yoghurt Production Challenges

Temperature Control

Maintaining precise temperatures throughout production is crucial for quality and safety.

Starter Culture Management

Ensuring viability and consistency of bacterial cultures affects product quality.

pH Monitoring

Accurate pH control is essential for flavor, texture, and shelf life.



Conclusion

Yoghurt processing exemplifies how traditional fermentation enhances food security. It extends shelf life while maintaining nutritional value and sensory quality. Strict hygiene and effective starter cultures create safe, delicious products meeting consumer demands.