SDT SPRING CONFERENCE 2024
– FERMENTED CREAMS

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AGENDA – FERMENTED CREAM

1. Starter culture
   - No gas vs gas formation

2. Texture creation

3. Shelf-life extension
   - Taste stability

4. Other mesophilic products
Watch the video below to learn about the ways we can help you ignite dairy delight.
ROLE STARTER CULTURE

Control acidification
Texture creation
Flavor production
Gas formation (optional)
Taste stability
FREMENTED CREAM PROCESS

- Standardization of cream
- Homogenization
- Pasteurization / 90-95°C for 5-10 min
- Inoculation with starter culture
- Fermentation at 20-34°C → pH 4.5 - 4.6
- Cooling & filling
- Cold storage

Optional: stabiliser

Homogenization conditions

Culture selection
STARTER CULTURE
MESOPHILIC VERSUS THERMOPHILIC
Basics – bacteria with different preferences

Thermophilic [34-43°C]
Products:
• Stirred yogurt
• Set yogurt
• Drinking yogurt
• Concentrate yogurt

Mesophilic [22-36°C]
Products:
• Fermented cream
• Quark/fresh cheese
• Kefir
• Buttermilk
TYPICAL STRAINS IN FERMENTED CREAM

**Optimal temperature**

- **20-24°C**
  - Leuconostoc

- **30-34°C**
  - Lactococcus lactis subsp diacetylactis

- **28-34°C**
  - Lactococcus lactis subsp lactis / cremoris

- **40-43°C**
  - Streptococcus thermophilus

**Flavor intensity / Gas (NB! Strain)**

**LEGEND:**
- Flavor / Gas
- Texture / Smoothness
- Speed

NB! Strain dependent!
FLAVOR & GAS FORMATION

Lactose

Citrates

Lactic acid

Flavor components

CO2

Leu

ST

o-Lc

LcD
FOCUS ON FLAVOR COMPOUNDS

- **a-acetolactate**
  - ↓ DIACETYL
  - **buttery flavor**
  - ↓ ACETOINE
  - **tasteless**
  - ↓ butylene glycol

- **PYRUVATE**

- **ACETALDEHYDE**
  - **green flavor**
  - ↓ ethanol

**Process factors:**
- **T, °C**
- **time**
ACIDIFICATION CONDITIONS ARE CRITICAL FOR FLAVOR!

Flavor and gas production in your product depend on:

- Minor difference in **fermentation temperatures**
- … that cause differences in strain ratio
FERMENTATION TIME IN FERMENTED CREAM

Different starter culture will have different fermentation behaviour

CINAC acidification curves

CH BM/SC 401 - FRO - 30
CH BM/SC 401 - FRO - 22
CH BM/SC 401 - FRO - 26

CH SC 102 - LYO - 37
CH SC 102 - LYO - 31
CH SC 102 - LYO - 28
CH SC 102 - LYO - 34
CULTURE GROUPING MESOPHILIC TYPES

- HOMOFERMENTATIVE (LD & LEU)
- HOMOFERMENTATIVE (LD & LEU)
- HOMOFERMENTATIVE (LD)
- HOMOFERMENTATIVE (LEU)
- HOMOFERMENTATIVE (LEU)
- HOMOFERMENTATIVE + THERMO
- HOMOFERMENTATIVE

Flavor / gas

Optimal acidification temperature

20°C - 34°C

These culture series feature HIGH TEXTURE PROPERTIES

No gas

High

Cultures group
TEXTURE CREATION

Fermentation temperature
Starter culture w. EPS
Season variation
TEXTURE FORMATION

Lactose

ST

\(\sigma-Lc\)

Lactic acid

Poly-sacharides

Gelation

Capsular EPS

Non-capsular EPS

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MESOPHILIC TEXTURIZING STRAINS: WHAT IS YOUR OPTIMAL TEMPERATURE?

**Firm / Thick texture**
- > Increase fermentation temperature

**Glossy appearance / Velvety texture**
- > Decrease fermentation temperature

Sensory evaluation

- Glossy appearance / Velvety texture
  - Increase fermentation temperature

- Firm / Thick texture
  - Decrease fermentation temperature
TERMOPHILIC TEXTURIZING STRAINS: WHAT IS YOUR OPTIMAL TEMPERATURE?

Increase texture
- Increase fermentation temperature

Increase of acidification temperature above 32°C rapidly improves viscosity, smoothness and glossy appearance.

Texture feature points (rheology)

- 28°C
- 31°C
- 34°C
- 37°C

Mouthfeel
Thickness
**IMPACT FROM THE CREAM**

**Sour cream 15% fat**

- **Culture without texturizing strain**
- **Texture +**
- **Texture ++**

*Viscosity*

- **February**
- **June**

**Fat Fraction (by content %)**

- **Low Melting Fat ~ 55%**
- **Medium MF ~ 35%**
- **High MF ~ 10%**

**Fatty Acid Composition**

- **saturated FA**
- **short chain / cis unsaturated FA**

**Grass-fed Summer** → **Indoor Winter**
SHELF-LIFE EXTENSION

Taste stability
Maintaining quality
TASTE STABILITY IN FERMENTED CREAM

Maintain taste over shelf-life period

Traditionally shelf-life of fermented cream is short compared to the shelf-life of yogurt.

Main reason is, that the taste change over the shelf-life period from being fresh and clean towards cheesy and un-clean flavor profile.
INTRODUCING PROTECTIVE CULTURES

• Live cultures - isolated from food
• Unique properties - control unwanted microorganisms
• No negative sensory impact
• Fermentation process is required
• Both dairy-based and non-dairy (without dairy allergens)

![Fermentation at 30°C](image)

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**Without protective culture**

**With protective culture**

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OTHER MESOPHILIC PRODUCTS

Kefir
Fresh cheese/quark
Buttermilk
Plant-based products
KEFIR

What is kefir

- Part of the “sour milk drinks” family, like buttermilk
- Fermented milk product obtained by incubating milk with microflora of kefir grains
- Production of kefir is unique – involves a mixed lactic acid and alcoholic fermentation of lactose
- Contains different species of lactic acid bacteria including various species of *Lactobacillus, Lactococcus, Leuconostoc, Streptococcus* and yeast - both lactose fermenting and non-lactose fermenting
FERMENTED COCONUT CREAM

Rich creamy fermented coconut cream with a simple/clean ingredients list.

Ingredients list:
Coconut cream, water/coconut water, pectin, flavor (optional), starter culture.
WHAT IS IMPORTANT IN YOUR FERMENTED CREAM?

- Fresh
- Fresh Stabilized
- Fresh Cooking Stable
- Ambient Stable

Taste
Texture

Texture Differentiation & Consistency

Consumer experience
Shelf stability

CHOOZIT® Cultures
HOLDBAC® Protective Cultures

GRINDSTED® PECTIN SY
GRINDSTED® YO-TEX 1000
GRINDSTED® SB

CHOOZIT® Cultures
HOLDBAC® Protective Cultures

GRINDSTED® SB

CHOOZIT® Cultures
HOLDBAC® Protective Cultures

CHOOZIT® Cultures

GRINDSTED® SB
UNCOMMON ANSWERS START WITH BOLD QUESTION