

Membrane filtration applications

in the dairy industry





RO applications

Polymer SW

Milk

- ▶ Skim milk: 34%TS
- ▶ Whole milk: 30% TS

Whey

- ▶ Sweet whey: 30% TS
- ▶ Acid whey: 17-20% TS

UF permeate

- ▶ Sweet UF permeate: 25% TS
- ▶ Acid UF permeate: 18-22% TS






Sweet buttermilk

- ▶ 26% TS

Environmental

- ▶ White water
- ▶ RO permeate
- ▶ NF permeate
- ▶ Evaporator condensate



-  Water
-  Dissolved salts
-  Sugars, amino acids
-  Proteins, polysaccharides
-  Particulates, colloids, bacteria



NF applications

Polymer SW

Milk

- ▶ Skim milk: 26% TS, 20% desalination

Whey

- ▶ Sweet whey: 30% TS, 40% desalination
- ▶ Acid whey: 20-21% TS, 25% desalination

UF permeate

- ▶ Sweet UF permeate: 25% TS, 40% desalination
- ▶ Acid UF permeate: 22% TS, 30% desalination

Concentrate

- ▶ WPC35 - WPC80 concentrated to 35% TS






Salty whey

- ▶ NaCl desalination

Cleaning solution

- ▶ Recovery of caustic cleaning solution



-  Water
-  Dissolved salts
-  Sugars, amino acids
-  Proteins, polysaccharides
-  Particulates, colloids, bacteria



UF applications

Polymer SW

Sweet and acid whey

- ▶ WPC35-WPC80
- ▶ Special products, yoghurt, desserts

MF permeate

- ▶ WPI >90

Milk

- ▶ MPC42-MPC85
- ▶ Protein standardisation (cheese milk, milk powder, market milk, yoghurt)
- ▶ UF cheeses (Feta, Domiati, Queso Fresco etc.)






Fermented milk and cream

- ▶ Quark, cream cheese, Mascarpone, Greek style yoghurt, Skyr, other fresh cheese types

Sweet buttermilk

- ▶ Retentate for food ingredients, powder



-  Water
-  Dissolved salts
-  Sugars, amino acids
-  Proteins, polysaccharides
-  Particulates, colloids, bacteria








UF applications

Ceramic

Fermented milk and cream

- ▶ Quark, Greek style yoghurt, Skyr, other fresh cheese types



-  Water
-  Dissolved salts
-  Sugars, amino acids
-  Proteins, polysaccharides
-  Particulates, colloids, bacteria



MF applications

Polymer SW

Milk

- ▶ Fractionation of caseins and whey proteins in skim milk






Whey

- ▶ Fat and bacteria removal

Cheese brine

- ▶ Purification, removal of microbiological impurities (bacteria, spores, yeast, mould)



-  Water
-  Dissolved salts
-  Sugars, amino acids
-  Proteins, polysaccharides
-  Particulates, colloids, bacteria



MF applications

Ceramic






Milk

- ▶ Fractionation of caseins and whey proteins in skim milk
- ▶ Removal of bacteria and spores, Bactocatch

Whey

- ▶ Removal of fat and bacteria



-  Water
-  Dissolved salts
-  Sugars, amino acids
-  Proteins, polysaccharides
-  Particulates, colloids, bacteria



Water removal and concentration

Concentration of milk and whey
for volume reduction

Benefits:

- ▶ Reduced transport cost
- ▶ Reduced effluent charges
- ▶ Reduced processing cost
- ▶ Reduced environmental footprint





Environmental - Green Technology

Recovery
of product, water, and CIP detergents

Benefits:

- ▶ Recovery of valuable milk solids from white water for improved process economy
- ▶ Recovery and recycling of process water
- ▶ Recovery of CIP detergents
- ▶ Reduced environmental load
- ▶ Reduced effluent charges





Milk concentration

Concentration of milk and fermented milk for white cheese and fermented products

Benefits:

- ▶ Higher yield and profitability
- ▶ More homogenous texture
- ▶ Flexible production
- ▶ Reduced amount of acid whey
- ▶ Improved processing economy





Protein and casein standardisation

Standardisation of proteins
for cheese milk, milk powder, liquid milk, yoghurt

Benefits:

- ▶ Maximum utilization of the cheese making equipment
- ▶ Improved processing economy, optimized process
- ▶ Increased yield



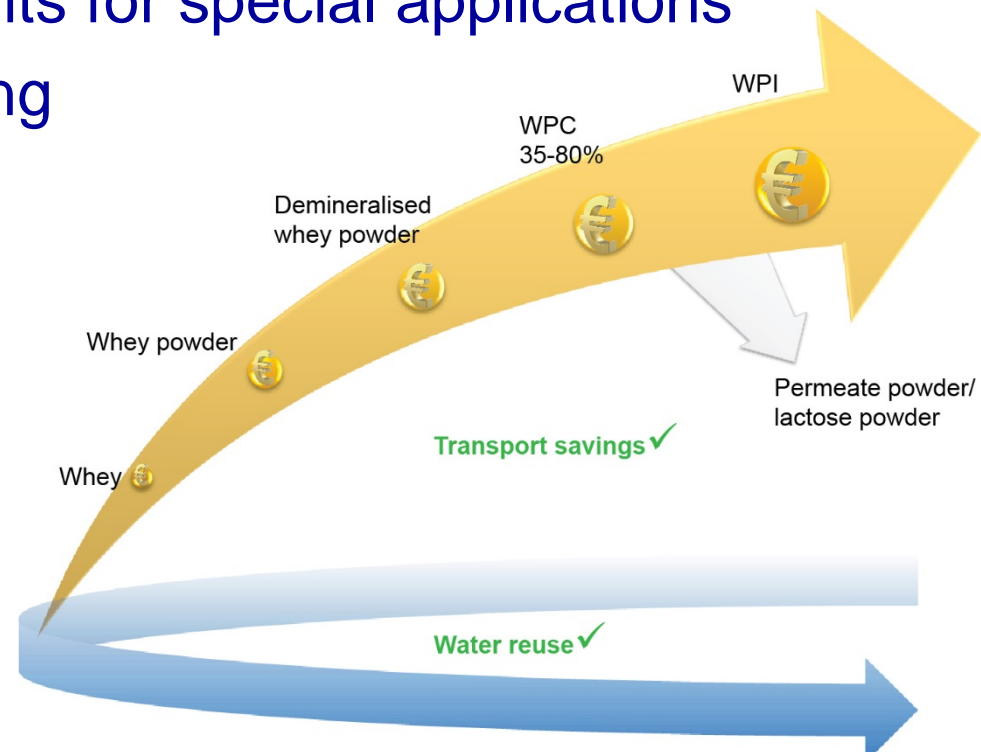


Fractionation and concentration

Fractionation and concentration of proteins for high-value ingredients

Benefits:

- ▶ Tailor-made ingredients for special applications
- ▶ Improved value-adding
- ▶ Improved processing economy





Bacteria and spore removal - milk

Removal of bacteria and spores in ESL milk and milk for cheese and powder

Benefits:

- ▶ No thermophile bacteria or spores
- ▶ Up to 99.9% reduction of bacteria and spores
- ▶ Uniform milk quality
- ▶ Reduced product loss
- ▶ Longer shelf-life, fresh taste longer
- ▶ Nitrate free cheese-making
- ▶ No sludge fraction





Bacteria and spore removal - whey

Removal of bacteria and spores in whey and whey concentrates

Benefits:

- ▶ No thermophile bacteria or spores
- ▶ Up to 99.9% reduction of bacteria and spores
- ▶ Improved quality of final product, making it suitable as ingredients for baby food and other sensitive products

