

Removal of bacteria and spores from skim milk

Removing bacteria and spores from milk and whey using membrane filtration makes sense in cases where the temperature surviving flora is a limiting factor and a high temperature treatment of the full flow is not applicable.

The main applications are production of milk with improved shelf life and production of nitrate free cheese and whey. Other applications are bacteria removal from whey and milk for dairy ingredients.

The most successful membrane filtration technology in this area until now has been microfiltration with ceramic membrane elements. These membranes have a rather "precise and narrow" pore size distribution and are resistant to most cleaning chemicals as well.



Ceramic membrane element support structure
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LONGER SHELF LIFE – USING MICROFILTRATION

The final shelf life of the drinking milk product is dependant on the feed quality, the filtration technology used and the downstream handling and the filling technology applied. Using aseptic or ultra clean solutions and a high quality raw milk will improve the possible obtainable shelf life of the products. With the tightest membrane types the shelf life of the white milk products would typically be around 3-4 weeks at 6-8 °C or 5-6 weeks at 4 °C.

HIGHER QUALITY OF CHEESE AND WHEY

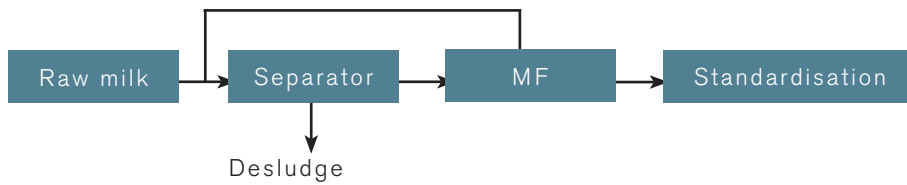
Nitrates can be added to the cheese to avoid cheese spoilage by spore forming bacteria. The nitrates are however in some countries unwanted additives to both cheese and the resulting whey product. Using a combination of microfiltration and a high temperature treatment of the cream it is possible to avoid the addition of a nitrate.

Some cheese types with a relatively high pH, high water content and/or low salt content are sensitive to growth of an unwanted micro flora. Such cheese products can also benefit from cheese milk with a very low initial bacterial count.

TAILOR MADE PROCESS

The membrane plant can be integrated into an existing processing line in a number of ways. SPX can help make the right choice of process for your specific dairy application.

PROCESS EXAMPLE



SPX patented solution

TECHNICAL DATA EXAMPLE

MF UNIT MEMBRANE TYPE	20,000 L/H MILK CERAMIC 1.4 M μ	40,000 L/H MILK CERAMIC 1.4 M μ
PEAK CONSUMPTION FIGURES		
Power consumption	145 kW	250 kWh
Cooling water flow	12 m ³ /h	21 m ³ /h
Process water flow	30 m ³ /h	40 m ³ /h
Steam consumption	750 kg/h	1,010 kg/h
Compressed air consumption	100 NI/min	100 NI/min
PLANT CONFIGURATION		
No. of loops	2	4
No. of feed modules	1	1
Loop dimensions (one loop only - l x w x h)	2.2 m x 2.0 m x 2.3 m	2.2 m x 2.0 m x 2.3 m
Feed module dimensions (1 x w x h)	2.2 m x 2.2 m x 2.0 m	2.2 m x 2.2 m x 2.0 m

PLANT EXAMPLE



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