



TECN.
Filtration Technologies **A.**

Membrane Systems for the Dairy Industry



MEMBRANE SYSTEMS FOR DAIRIES AND ZOOTECHNICS

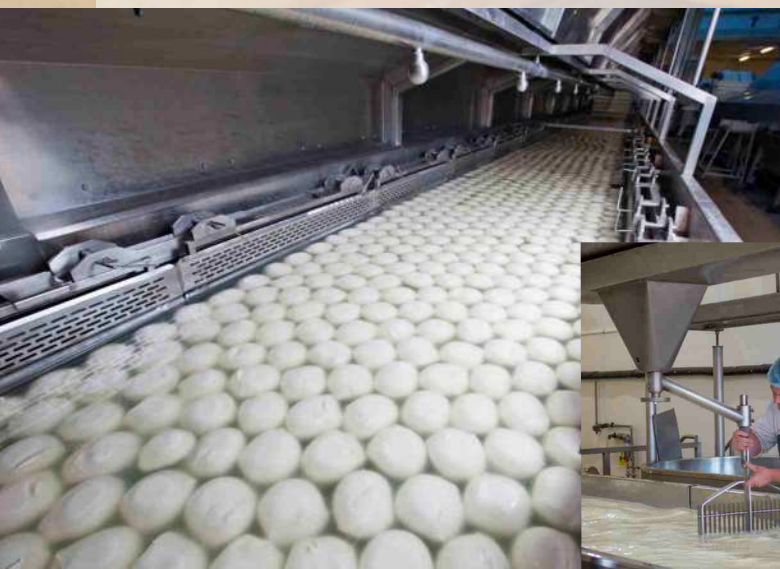
TECN.A. operates in the dairy industry by creating and assembling in its own factory a wide range of membrane systems for whey and milk tangential filtration and concentration.

Only the membrane techniques, among the existing separation and concentration methods, guarantee either the differential or the total recovery of all the dissolved components. After the processing these properties remain unchanged, with no denaturation, and leaving properties intact.

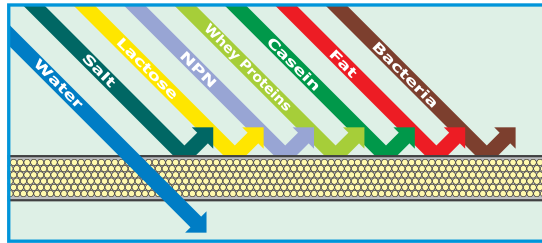
Specifically, using TECN.A. membrane systems, the whey, usually considered a difficult and expensive to be treated or disposed "waste", becomes a supplementary source of profits. Moreover the brine, that generally needs periodical treatment and replacement, becomes a chemically and bacteriologically stable, always "fresh" solution.



TECN.A. systems are designed and assembled to satisfy the needs of all dairies, either small or big, giving to each one the right customized solution, and thus always guaranteeing the best cost/effectiveness relationship and a quick return on investment (ROI).



TECN.A. designs and assembles the following membrane systems for dairies and zootechnics:



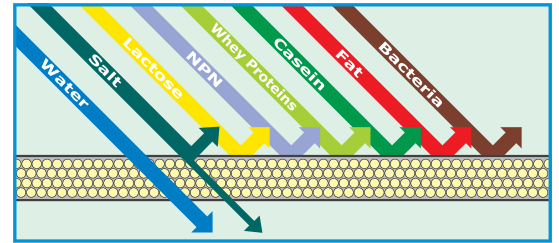
Reverse Osmosis

REVERSE OSMOSIS SYSTEMS

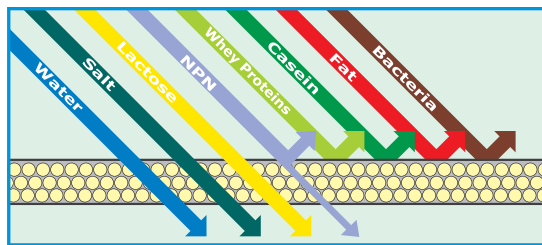
The reverse osmosis processes the whey and the skimmed milk in order to increase their concentration. This method allows to recycle the drained water (permeate) or to dispose it in compliance with law limits.

NANOFILTRATION SYSTEMS

The whey nanofiltration allows to obtain a partially demineralized concentrate that can be used in the calves breeding and for further milk-drying processes.



Nanofiltration



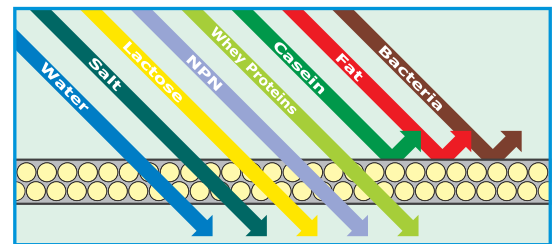
Ultrafiltration

ULTRAFILTRATION SYSTEMS

The ultrafiltration process, applied to whey and milk, gives the means to concentrate and separate the proteins from lactose and mineral salts (MPC and WPC)

MICROFILTRATION SYSTEMS

Microfiltration is mainly used for brines tanks purification, in order to keep them both clear and chemically / bacteriologically stable.



Microfiltration (0.1µm membrane)

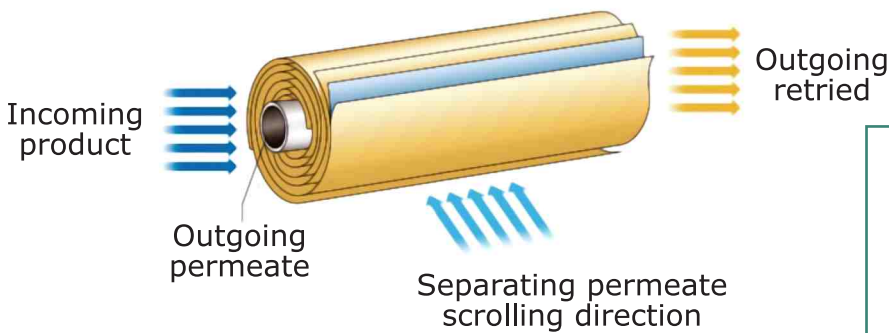


WHEY CONCENTRATION

TECN.A. designs and assembles two types of membrane systems for whey concentration:

- ∅ Reverse osmosis systems
- ∅ Nanofiltration systems

REVERSE OSMOSIS removes the water from the whey, concentrating it from 3 to 5 times its initial volume. This process allows to achieve enormous savings in both whey transportation and in the evaporation processes for its pulverization.



	SKIMMED WHEY	CONCENTRATE WHEY BY REVERSE OSMOSIS	PERMEATE
VOLUME	100	33.5	66.5
lactose	4.80%	14.36%	0.02%
proteins	0.60%	1.80%	0.00%
NPN	0.20%	0.58%	0.01%
ashes	0.55%	1.61%	0.02%
fats	0.05%	0.15%	0.00%
TS	6.20%	18.50%	0.05%

results with reverse osmosis on whey



NANOFILTRATION, on the other hand, removes the water, the monovalent salts (sodium and potassium chlorides) and some of the calcium and magnesium salts from the whey, thus achieving the whey concentration and a partial demineralization of it.

In comparison with reverse osmosis, higher concentration values (up to 4-5 times) are reached which, together with a reduced presence of ashes, ensures a concentrated product with higher protein content.

These unequivocal advantages are countered by a worse permeate quality, due to salts and NPN, so if an adequate effluent treatment plant is not present, a **"POLISHER" REVERSE OSMOSIS** that treats the permeate will have to be coupled with the nanofiltration system.

	SKIMMED WHEY	CONCENTRATE WHEY BY NANOFILTRATION	PERMEATE
VOLUME	100	23	77
lactose	4.80%	19.82%	0.29%
proteins	0.60%	2.58%	0.00%
NPN	0.20%	0.39%	0.14%
ashes	0.55%	1.00%	0.42%
fats	0.05%	0.22%	0.00%
TS	6.20%	24.01%	0.85%

results with nanofiltration on whey

In zootechnics, in the breeding of calves for white meat, the use of the concentrated whey produced with TECN.A. processes (either by osmosis or nanofiltration) provides the farmers with secure and substantial economic benefits.



MILK AND WHEY ULTRAFILTRATION

ULTRAFILTRATION has many applications in the dairy industry for the standardization and concentration of milk (MPC) and whey proteins (WPC) and for the reduction of lactose in milk.

Milk, thus concentrated and standardized in the proteins content, is being used for the production of different kinds of cheese with considerable advantages, both in terms of yield and quality.

In addition, proteins enriched milk is ideal for the production of yogurt, kefir, fermented milk in general, etc..

The ultrafiltration process, applied to the whey, gives the means to obtain a concentrate with a very high content of proteins and a low lactose and mineral salts rate (WPC35).

Using the diafiltration process, values of proteins concentration up to 80% (WPC50, WPC65, WPC80) can be reached.

	SKIMMED MILK	CONCENTRATE MILK BY ULTRAFILTRATION
VOLUME	100	28
lactose	4.97%	4.63%
proteins	3.31%	11.71%
NPN	0.21%	0.30%
ashes	0.71%	1.19%
fats	0.05%	0.18%
TS	9.25%	18.01%

results with ultrafiltration on milk

	SKIMMED WHEY	CONCENTRATE WHEY WPC35 BY ULTRAFILTRATION
VOLUME	100	16.6
lactose	4.80%	4.65%
proteins	0.60%	3.30%
NPN	0.20%	0.30%
ashes	0.55%	0.75%
fats	0.05%	0.21%
TS	6.20%	9.21%

results with ultrafiltration on whey



BRINE FILTRATION

Brine is submitted to a natural and continuous contamination by bacteria, spores, molds, yeasts and fat, and all that gets in contact with it.

When the "pollution" limit is reached in the brine tank, it becomes necessary to partially or completely renew it.

This process has to be repeated periodically, depending on the different types of cheese.

The traditional filtration systems which use diatomaceous earth/Kieselguhr filtration usually have a very low efficiency, leading to high processing and disposal costs.

TECN.A. designs and assembles **MICROFILTRATION** membrane systems for the continuous purification of brine tanks.

By separating colloids, bacteria, spores, molds yeasts and fat, these systems provide the brine with clarification and microbial stabilization, thus guaranteeing the properties of other components, such as proteins and salts.



Process yield	> 98%
Salt removal	< 0.5%
Bacteria and spores reduction	> 99.4%
Yeasts and molds reduction	> 99.9%
Permeate turbidity	< 0.2 NTU





ISO 9001:2008



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