

Workshop on water reuse in the dairy industry

- Introduction
- Background
- Process
- Why reuse at AFISA?



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- Dairy Technician, Senior Project Manager at AFI in Viby.
- Employed with Arla Foods Ingredients for almost 30 years.
- Reuse of water and thereby saving groundwater and obtaining less wastewater cost has always been a part of the job.
 - “On the floor” work, starting with reuse of condensate from evaporators.
 - Learning the hard way that: product water for reuse must be treated like milk or whey. Everything in the process of water reuse must be made in a way so that it can be cleaned on a daily basis.
 - Learning the hard way that: HACCP considerations/RISK evaluations must be performed like was it any other food product for consumption.

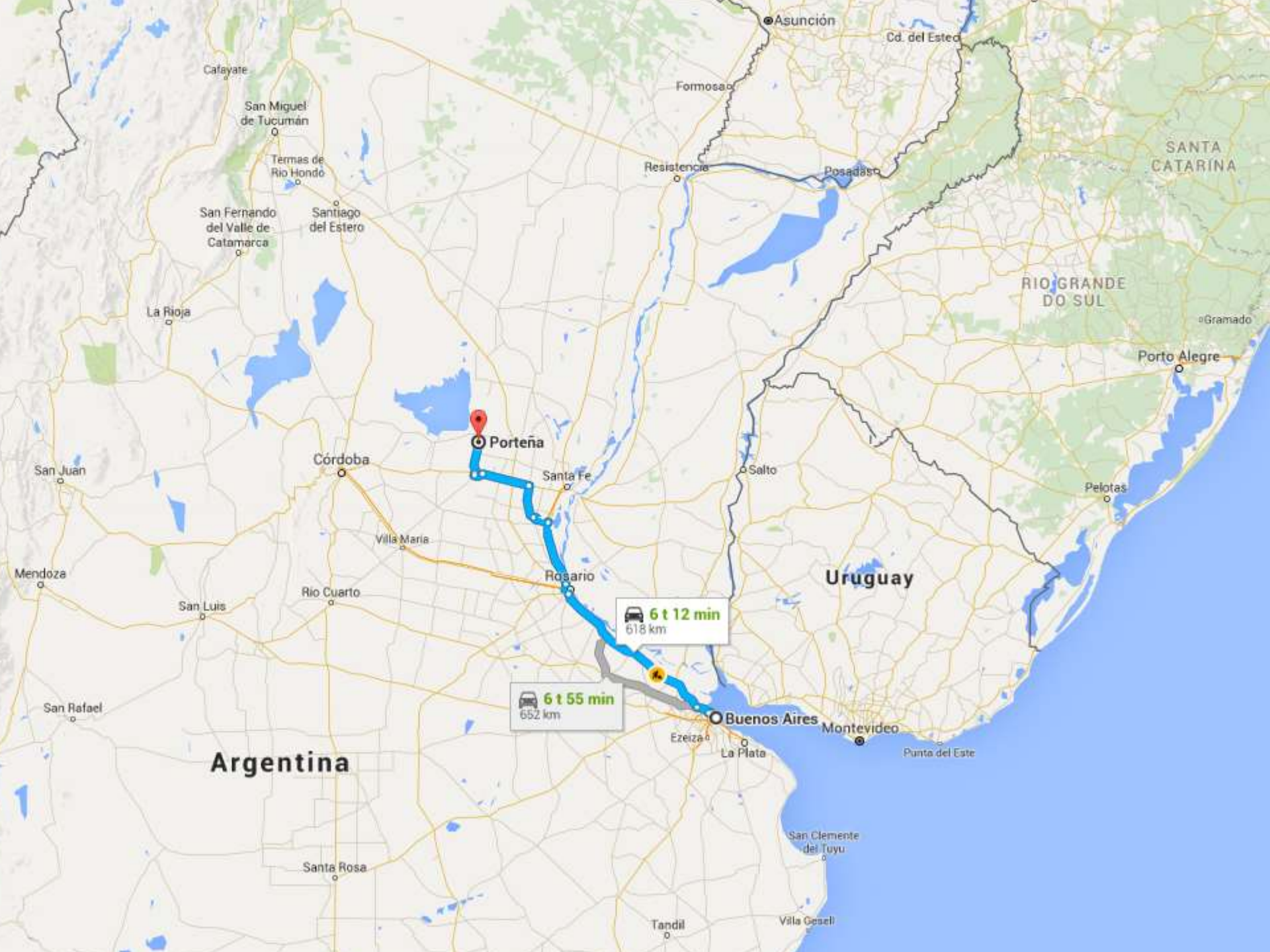
**HARD
WORK**



AFISA site background

- The site was erected in 2001 and production started in April 2002.
- Joint venture between Argentina's largest dairy company SanCor and AFI.
- Production of WPC and permeate powder sold world wide.
 - Today intake: 900.000 ton of whey/year
 - WPC 80 (80% prot/DM) 7.000 ton
 - Permeate (86% lactose/DM) 24.000 ton
- Situated in the middle of the Argentinian pampas 600 km north west from Buenos Aires





Argentina

Uruguay

SANTA CATARINA

RIO GRANDE DO SUL

Asunción

Cd. del Este

Formosa

Resistencia

Posadas

Cafayate

San Miguel de Tucumán

Termas de Río Hondo

San Fernando del Valle de Catamarca

Santiago del Estero

La Rioja

San Juan

Córdoba

Porteña

Santa Fe

Salto

Villa María

Rosario

Mendoza

San Luis

Río Cuarto

Buenos Aires

Montevideo

Punta del Este

Ezeiza

La Plata

San Clemente del Tuyu

Santa Rosa

Tandil

Villa Gesell

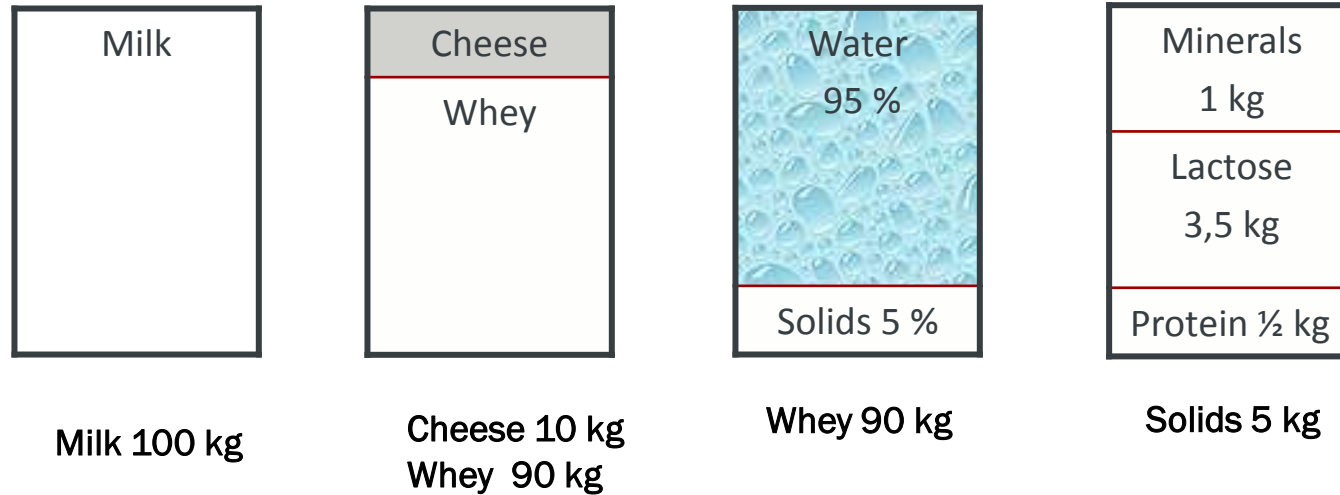
6 t 12 min
618 km

6 t 55 min
652 km

AFISA site.



“Mass balance”

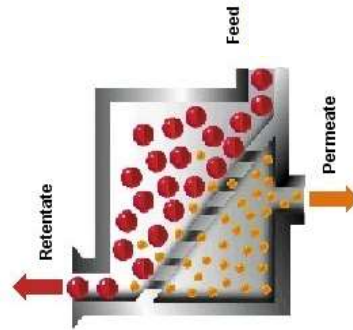


In the cheese dairy, cheese is made from raw milk. From 100 kg milk approx. 10 kg cheese and 90 kg whey are produced. The whey consists of 95% water. The remaining 5% dry matter consists of three main constituents:

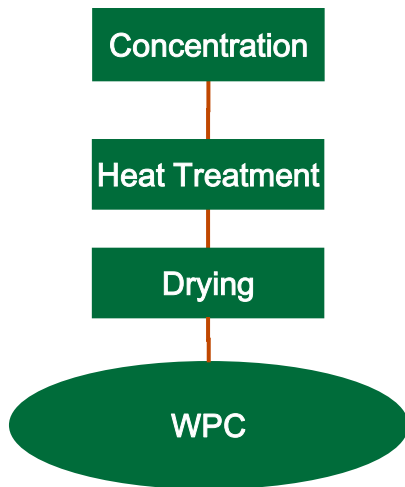
1. Whey protein, which make out 1/10
2. Lactose which makes out 7/10
3. Milk minerals which make out 2/10

Flow of Production

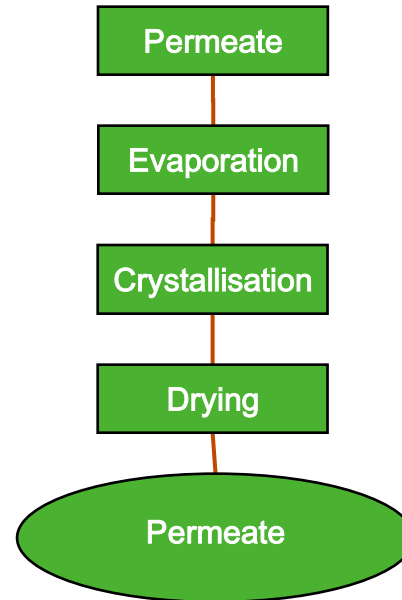
Whey



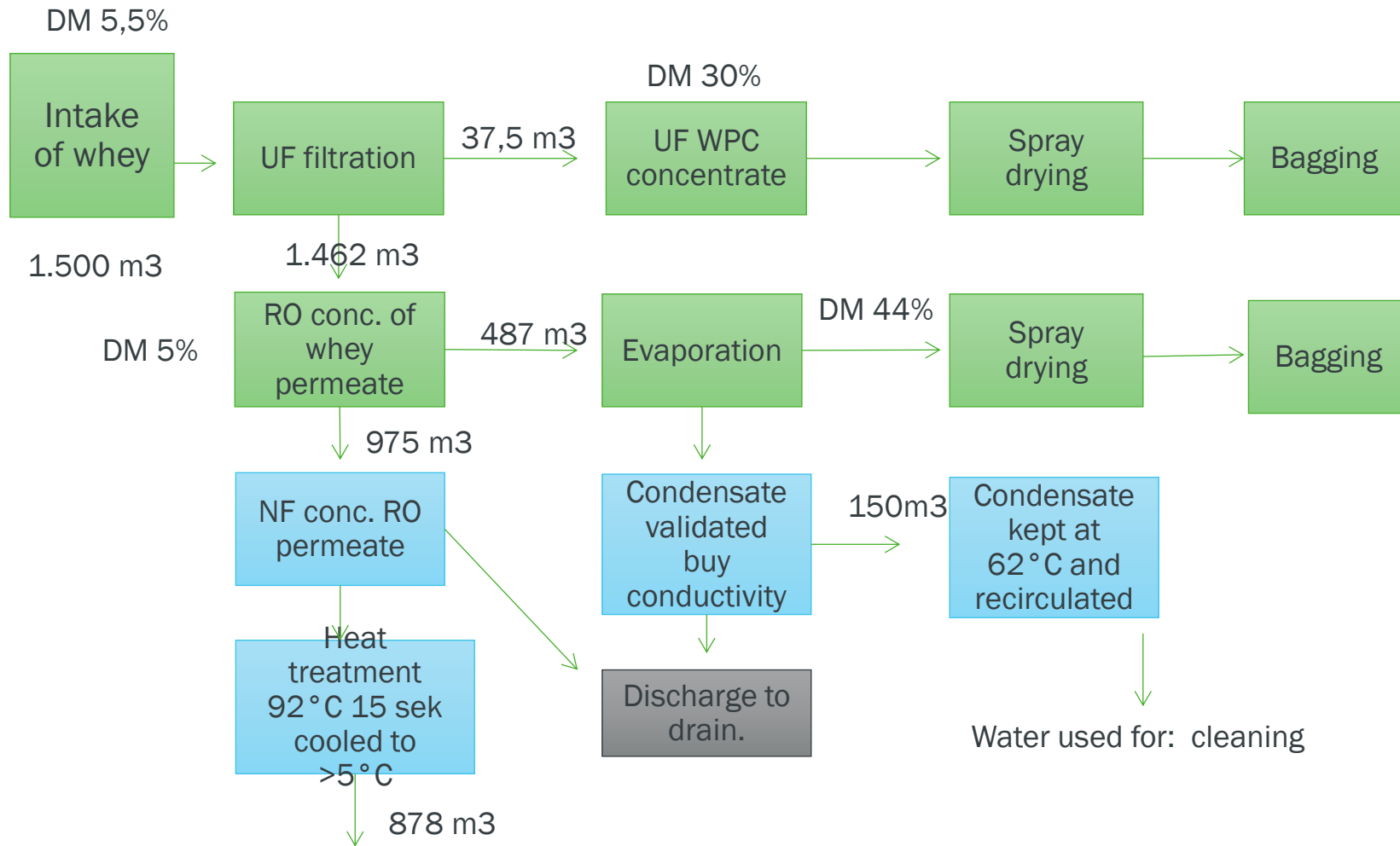
Retentate



Permeate



Process AFISA



Water used for: process and cleaning

In total approx. 1.000 m³ reuse out of 1.500 m³ intake



Why reuse at AFISA?

- Very very salty water from the underground almost like sea water and therefore very aggressive.
- Not possible to produce/use for WPC/Lactose products directly because of salt content.
- We knew this was an issue before we built the site and used our know-how from reuse of “milk water” obtained in DK.
- Some groundwater is today RO filtrated and used in process because of lack of water, but it is expensive and all the salts end up in the wastewater plant.
- Because of huge transport distances our raw material comes to the site more and more as concentrated whey. This is OK for transport savings but it challenges the site to be even more effective in reusing water.



Thank you for your attention.

Questions?



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