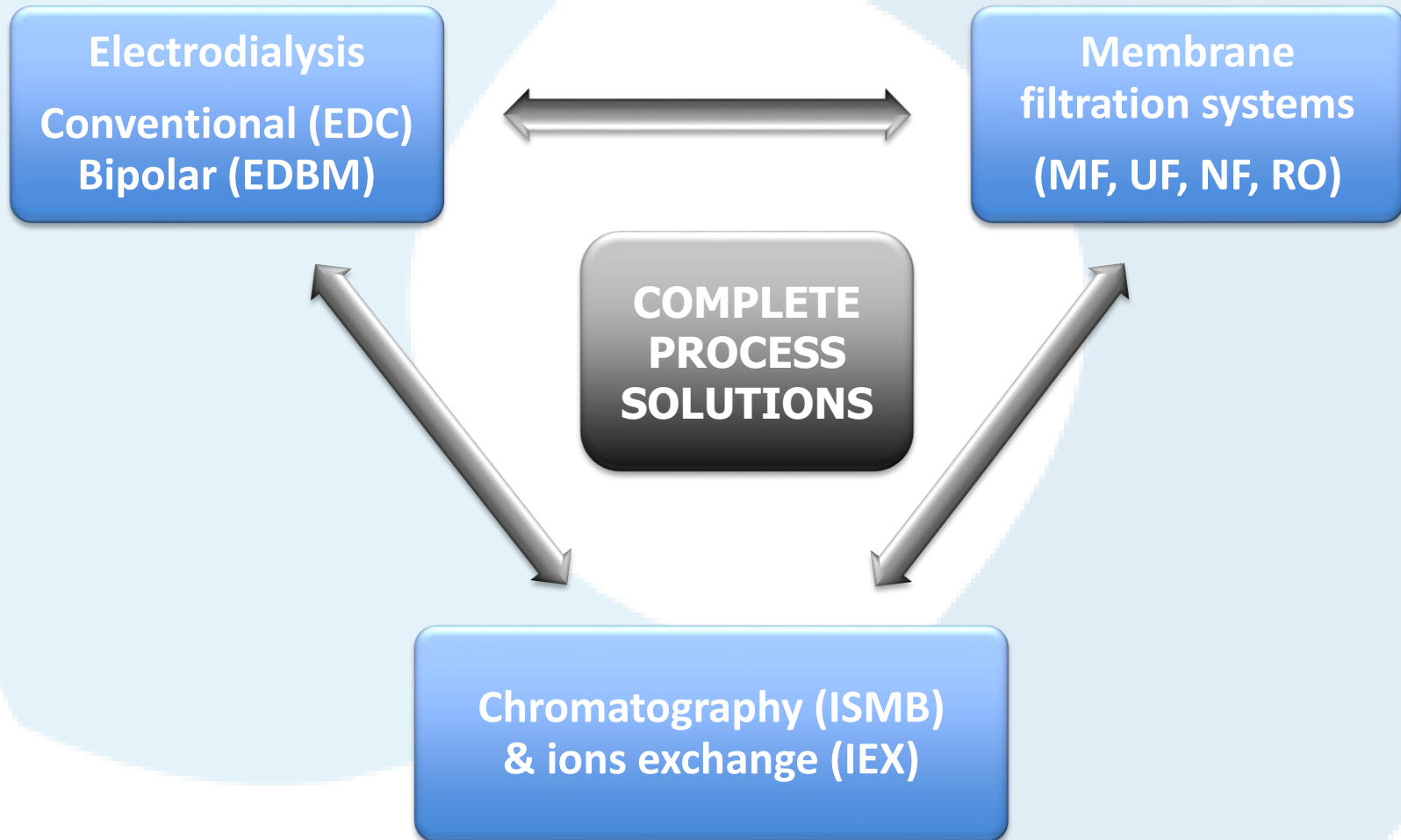




Technologies membranaires et d'échanges d'ions dans les procédés de protéines laitières et végétales

Florence LUTIN - Adebiotech – 29/10/2013

ADVANCED SEPARATION TECHNOLOGIES



MAIN APPLICATIONS



DAIRY INDUSTRY

- Valorization of whey
- Proteins fractionation
- Milk standardization



WINE – SUGAR – STARCH INDUSTRIES

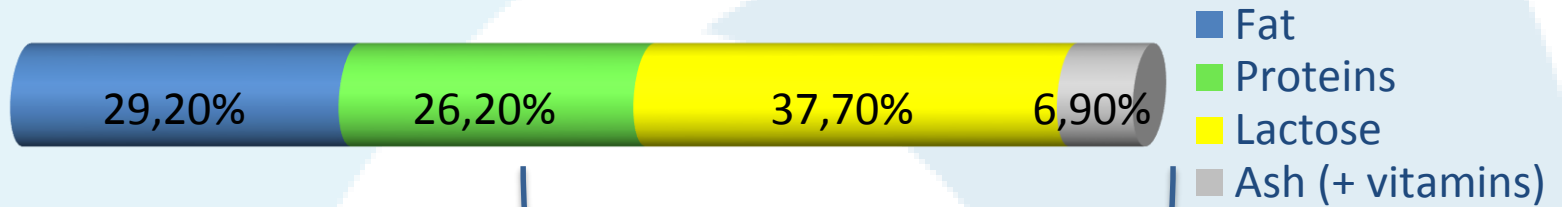


DAIRY INDUSTRY: PRODUCTION OF DWP90



**DEMINERALIZATION OF WHEY
PROTEINS CONCENTRATE (WPC)**

Cow milk (dry matter)



Fat for Cheese / butter /
cream...

Casein for Cheese /
Casein production...

Whey, co-product of
milk transformation :

- **Whey proteins**
- **Lactose**
- **Minerals (+ vitamins)**

Some typical values of whey

	Sweet whey	Acid whey (Cheese)	Acid whey (casein)
pH	5,8 – 6,5	~ 4,5	~ 4,5
Lactose (% on DS)	~ 75 %	~ 58 %	~ 70 %
Proteins (% on DS)	~ 12,5 %	~ 11,8 %	~ 11,3 %
Ash (% on DS)	~ 8,5 %	~ 12 %	~ 11 %
Organic acids (% on DS)	~ 3,5 %	~ 16 %	~ 3 %

➔ Whey proteins : around 12% -
composition : β -lactoglobuline (50%) – α -lactalbumine (22%)



Different technologies of demineralization
+ different final product applications

Ion exchange



Electrodialysis



Filtration Systems (NF, RO)



➤ EURODIA is combining part or all technologies to demineralize, function of physico-chemical composition

Process 1

Liquid sweet whey

Ultrafiltration

WPC

IEX

WPC DM90

Lactose + salt
Cristallization

Process 2

Liquid sweet whey

Ion exchange
Nanofiltration
Electrodialyse

Whey DM90

Ultrafiltration

WPC DM90

Lactose
(High purity)
. Liquid
. solid

WPC and IEX

◆ Limiting Factors :

- ◆ Risk of precipitation : with pH variation
- ◆ Proteins losses : adsorption on resins
- ◆ Degradation of proteins

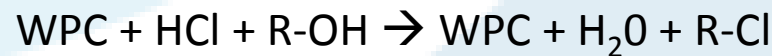
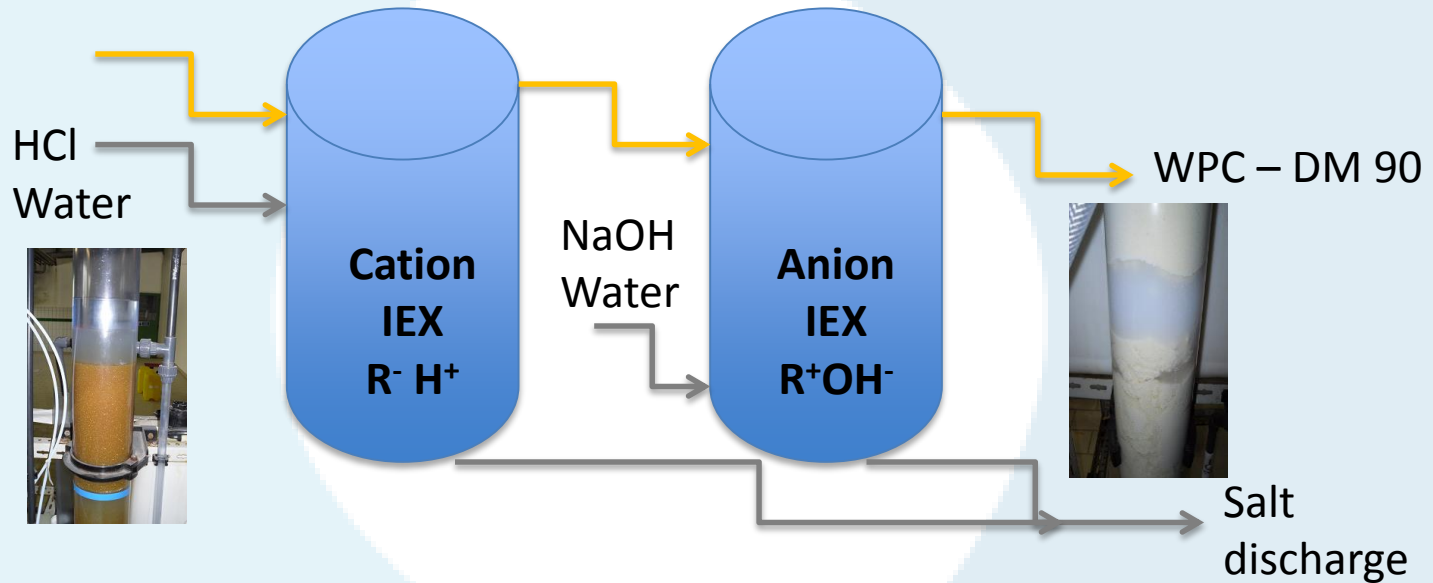
◆ Optimization of parameters :

- ◆ Concentration
- ◆ Temperature
- ◆ Flow rate
- ◆ Selection of Resins type

WPC 50
pH = 6.5
Cond = 5.6 mS.cm⁻¹

WPC 50
pH = 1.5 - 2

WPC 50
pH = 4.7
Cond = 0.5 mS.cm⁻¹



WPC and IEX

◆ Performances :

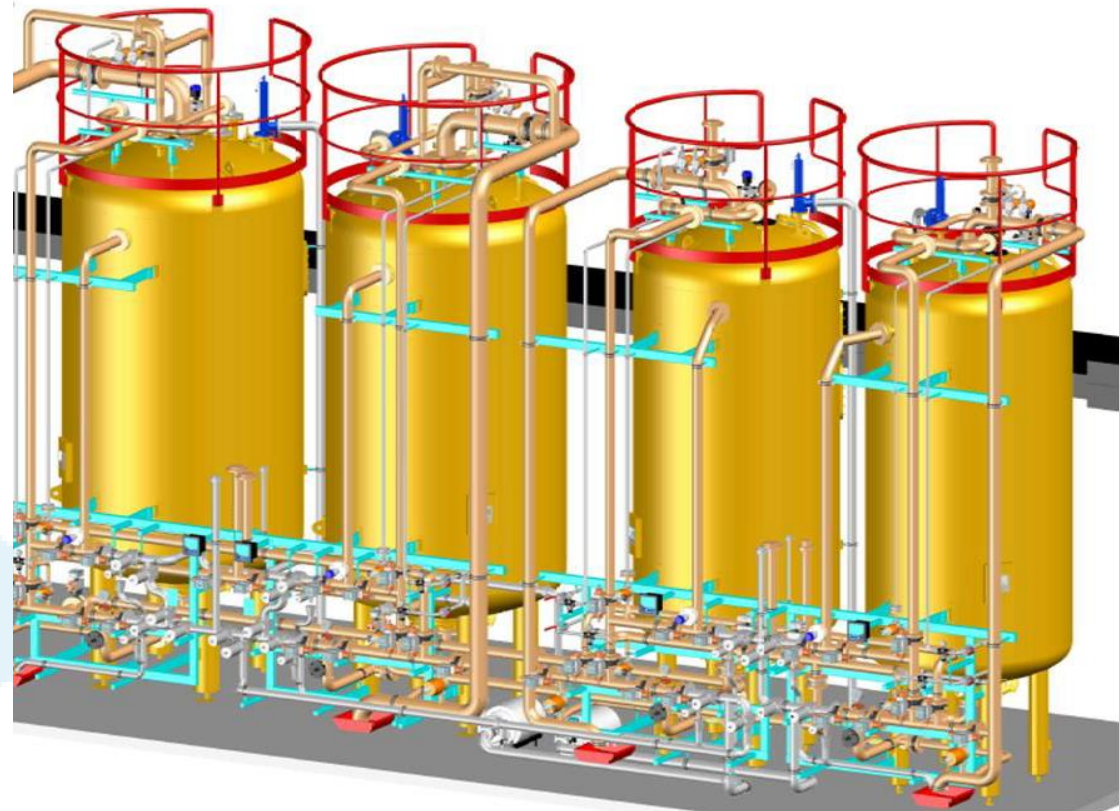
- ◆ High demineralization rate >90%
Ash < 1.5%
- ◆ Optimization : Flow rate
Temperature - Concentration
- ◆ Protein losses :
Resin A = 10% - Resin B = 6.6%

◆ Industrial scale - Optimization :

- ◆ Frequency of sanitation
- ◆ Water volume of rinsing



Typical Units Design



KNOWLEDGE OF WHEY FRACTIONATION



TRANSFER TO VEGETAL RESSOURCES

- **Precipitation : insoluble proteins**
- **Clarification - “Serum” Fractionation - Purification**
 - ➡ **UF - IEX – ED – NF/OI**



COOPERATION with institutes

Different studies : soya – potatoes – peas - lucerne



NEW MARKET



EURODIA
THE OPTIMAL PROCESS SOLUTIONS

Merci de votre attention

www.eurodia.com