

# Valorization of side-& by-streams from dairy production

Arla Foods Ingredients

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# Together we discover and deliver powerful nutrition for a stronger tomorrow

- 1,500+ colleagues
- 6.8 bn kg whey intake
- 290 mKG milk intake
- 760 mEUR revenue
- Global food industry partner
- Worldwide science network

- Dairy ingredient manufacture
- Business to business relations
- Engagement with global science partners
- Collaborative activities

# Ingredients business

## Business units and key capabilities

Pediatric  
High-quality  
ingredients for the  
infant segment



Health & performance  
Medical, health and  
high-end sports nutrition



### Key capabilities

- Application science
- Nutrition science
- Customer centricity

Food  
Highly specialised and  
functional milk proteins,  
permeate and lactose for  
value-add and/or cost  
efficiency in food applications



# Global partnerships

Partnering with NGOs, universities and other companies and organisations – with children and young women in focus



Scaling Up  
**NUTRITION**

**Business Network**  
ENGAGE • INSPIRE • INVEST



**VALORISE**  
A Circular Bioeconomy for the Kenyan Dairy Sector

A collaborative research project  
2022-2025

# Collaborative models for affordable nutrition

Driving transformative change and sustainable impact

Better nutrition for  
more people

Utilisation of dairy  
by-streams  
Food waste reduction  
Re-purpose into  
affordable nutritious  
dairy products

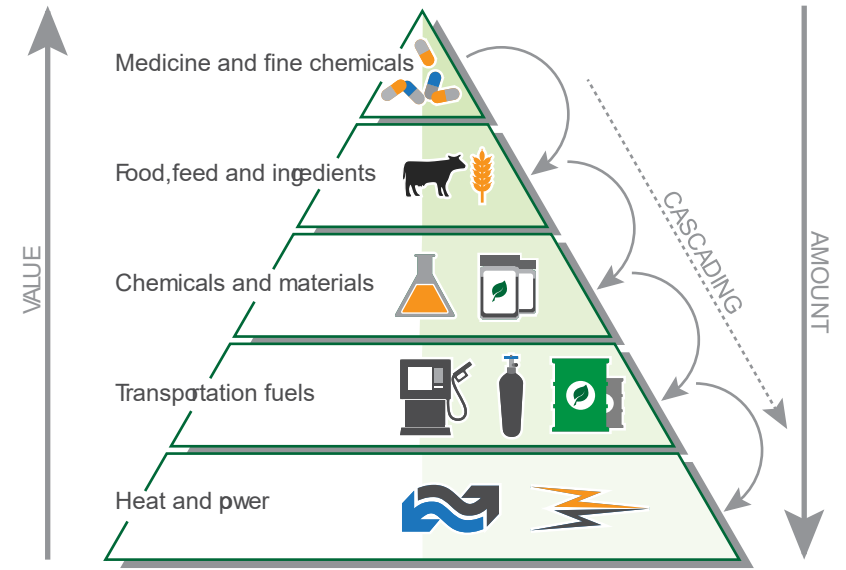
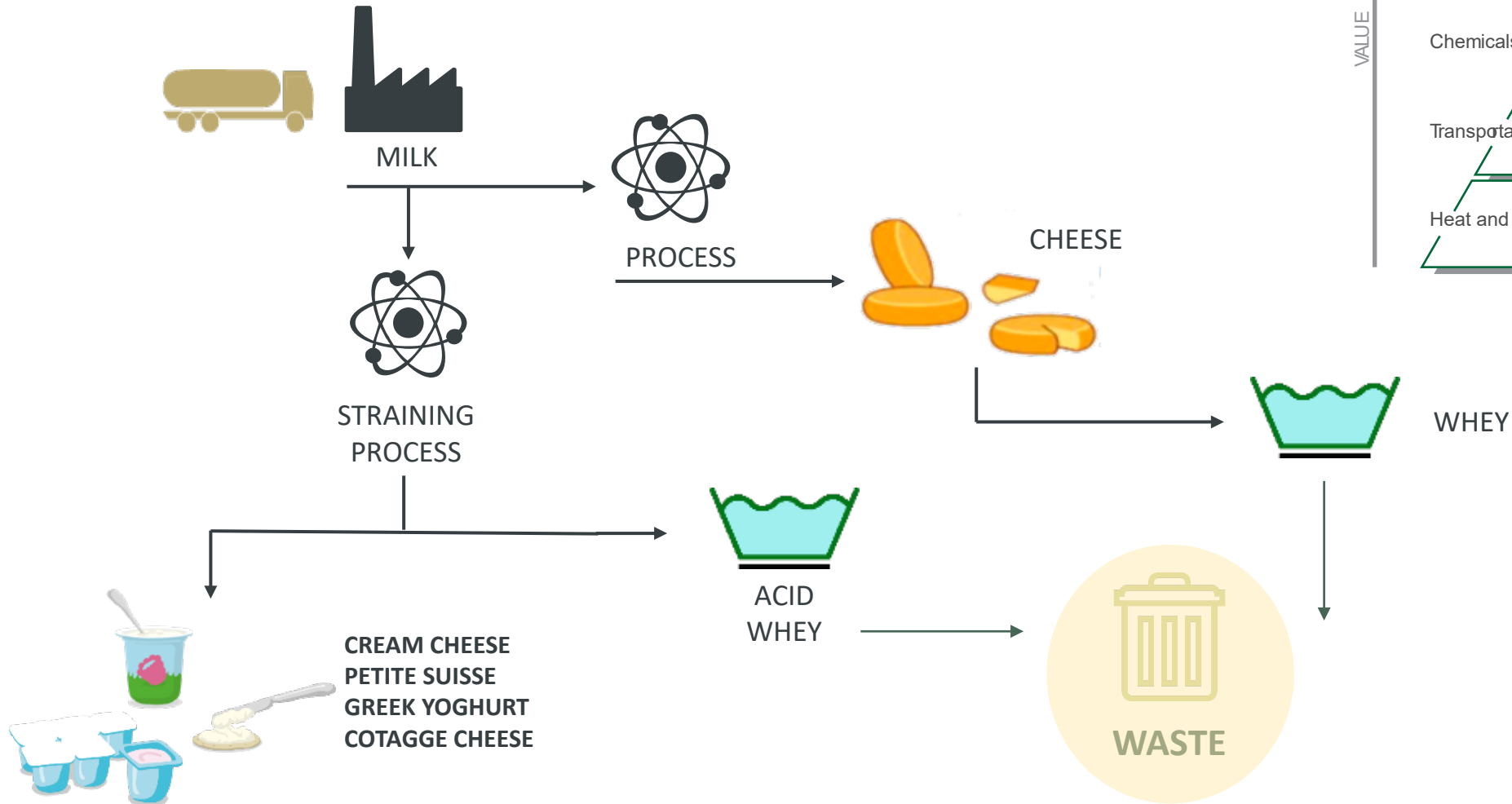
New value-adding  
products for local  
food producers

New markets for  
global ingredient  
players

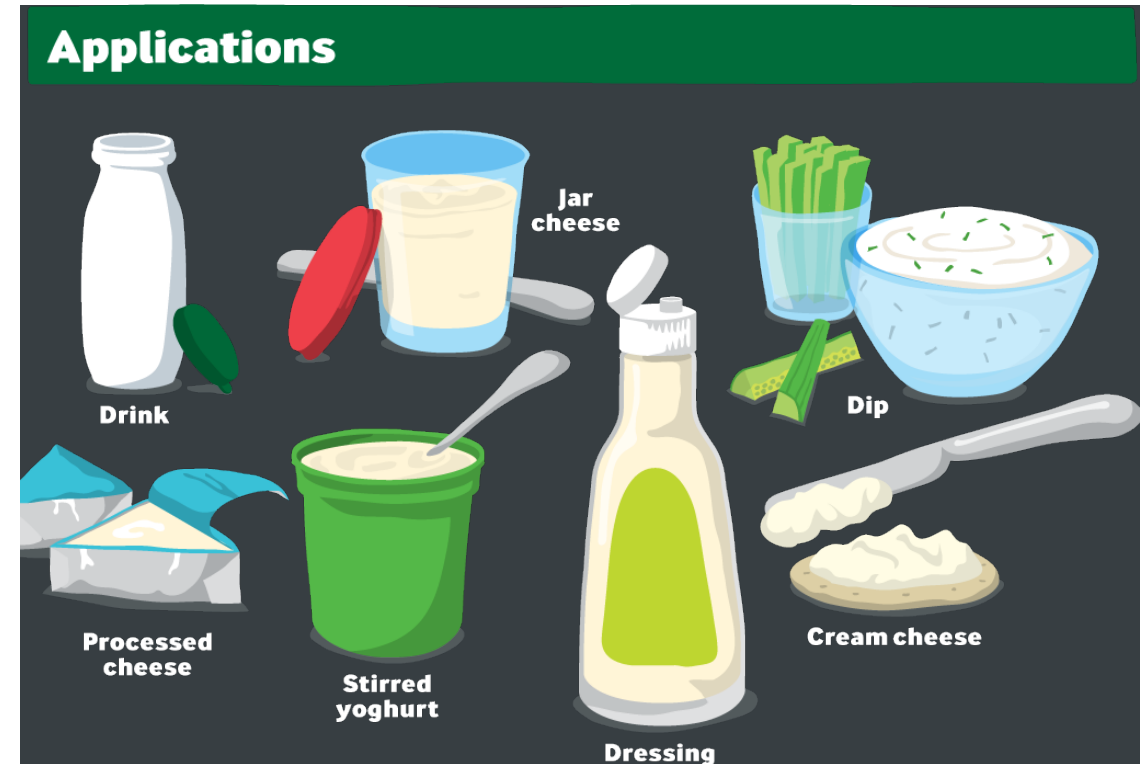
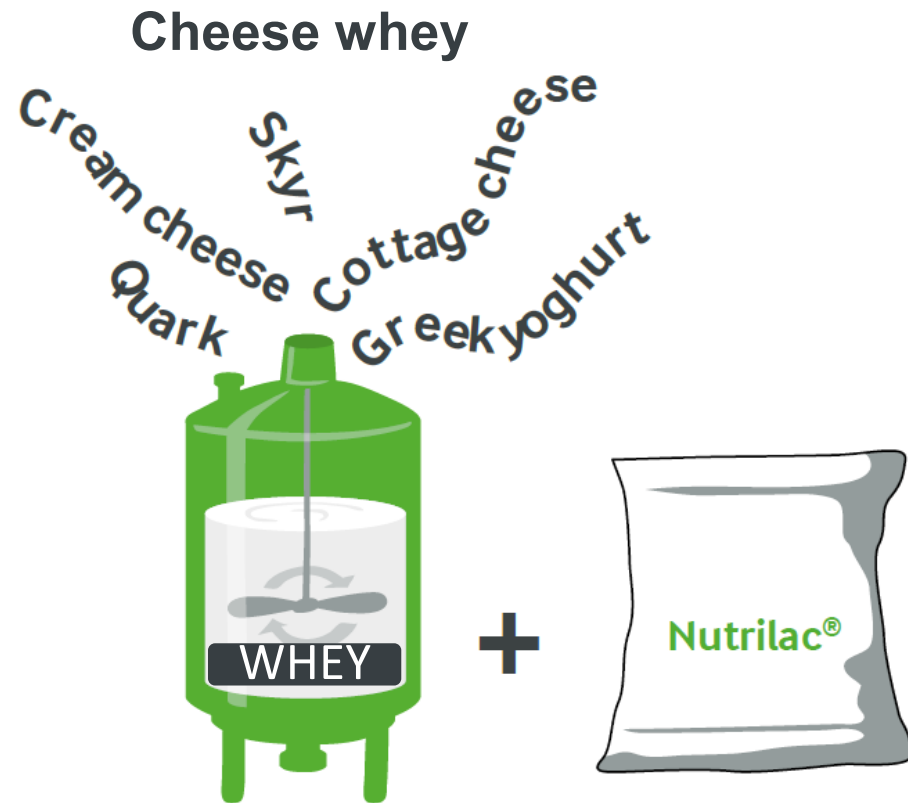


# TURNING WHEY INTO NEW BUSINESS

## From waste to new opportunities



# APPLICATIONS BASED ON DAIRY SIDE STREAMS

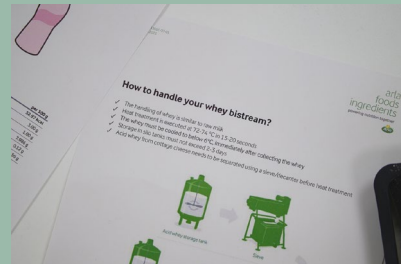


# Whey2Value

Greening the dairy sector in Pakistan

Pakistan's seven largest cheese producers produce about 145 million litres of whey water a year. About 30% of this whey water is disposed of.

How to valorise dairy waste streams to reduce environmental impact and support sustainable business and improved health ?



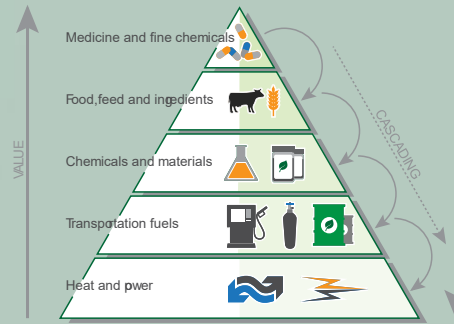
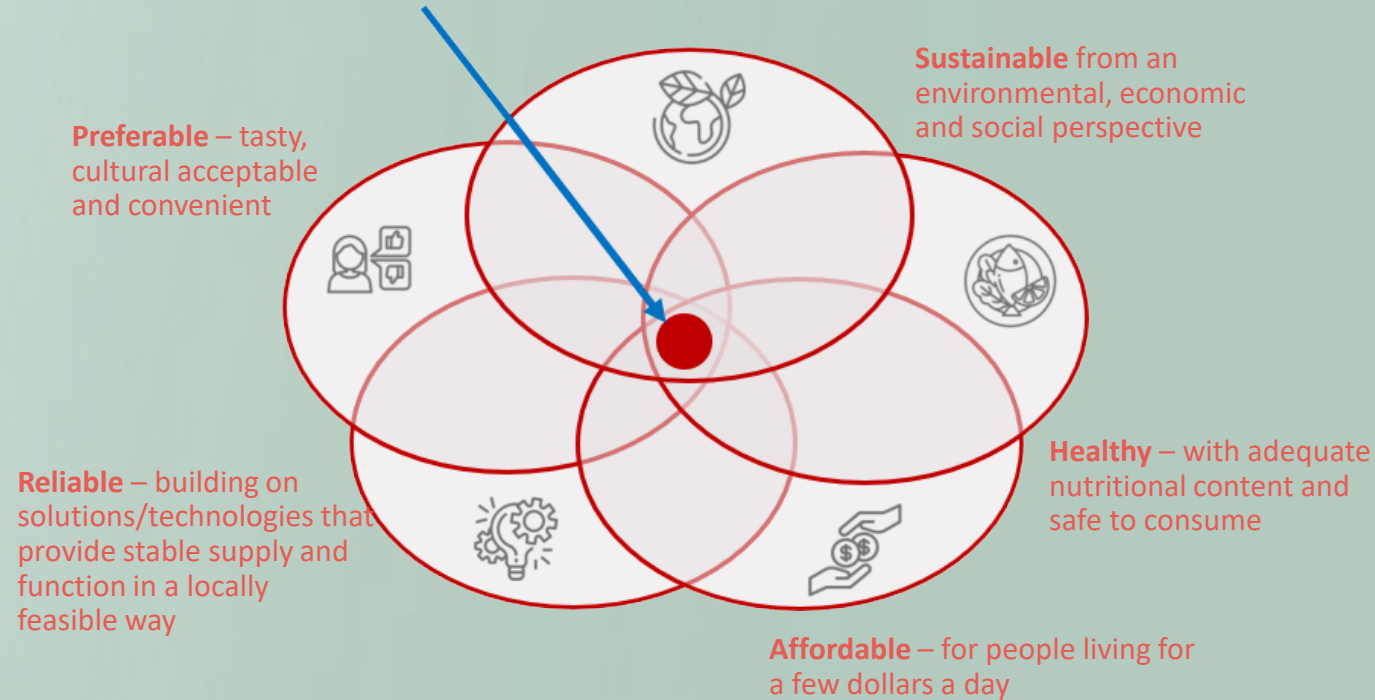


# Finding the “sweet spot”

– the foundation for scale up

## GAIN Nordic partnership model

“SWEET SPOT” using competencies of diverse partners is essential to find solutions that will honour all constraints



# Recipe

## Nutritious refreshing whey drink

<b>Nutrilac® FO-7875</b>	<b>3.500%</b>
Sugar. sucrose. white	5.000%
Sucralose Splenda Powder	0.003%
Tri-Sodium citrate dihydrate	0.100%
Flavour. strawberry 540340 T. Firmanich	0.200%
Cream. 38 % fat	1.900%
Pectin Grindsted AMD 922	0.450%
Colour Carmine CC-1000-WS	0.008%
<b>Sweet-/ Acid Whey (0.50% Protein)</b>	<b>50.000%</b>
Water. tap	34.839%

<b>Nutritive values (calculated)</b>	<b>per 100 g</b>
<b>Energy</b>	<b>52.97 kcal</b>
Protein	3.00 g
Fat	1.00 g
Carbohydrates	7.986 g
Calcium	0.12 g
Lactose	2.56 g

### Product benefits

- Drinkable viscosity
- Nice Smooth Mouthfeel
- Refreshing taste
- Nutritious digestible protein

### Sweet whey composition / approx.

Fat	0,5 %
Total solid	7,0 %
Ash	0,5 %
Protein	0,6 %
Lactose	4,5 %
pH	6,55-6,65



# Process parameters

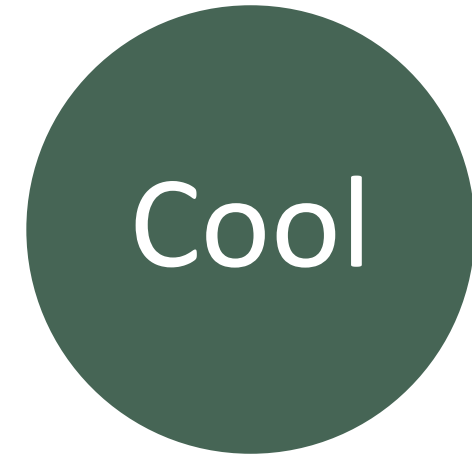
## UHT with up-stream homogenisation



- ✓ Dissolve dry ingredients in liquids
- ✓ Add flavour and colour
- ✓ Mixing time 15 min
- ✓ Hydration for min 30 min
- ✓ pH adjustment to pH 4.2



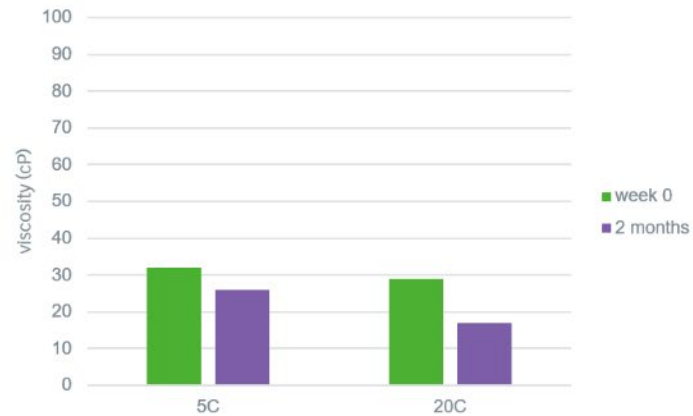
- ✓ Preheat: 65°C
- ✓ Homogenisation at 150/50 bar
- ✓ Heat to: 95°C (tubular heat exchanger)  
Holding time 60 seconds



- ✓ Cooling section 1: 40°C
- ✓ Cooling section 2: 20°C
- ✓ Cooling section 3: 10°C
- ✓ Aseptic filling
- ✓ Hot filling

# Shelf-life - product stability

## VISCOSITY Acid whey drink



1 week



2 months  
at ambient  
storage  
(20C)

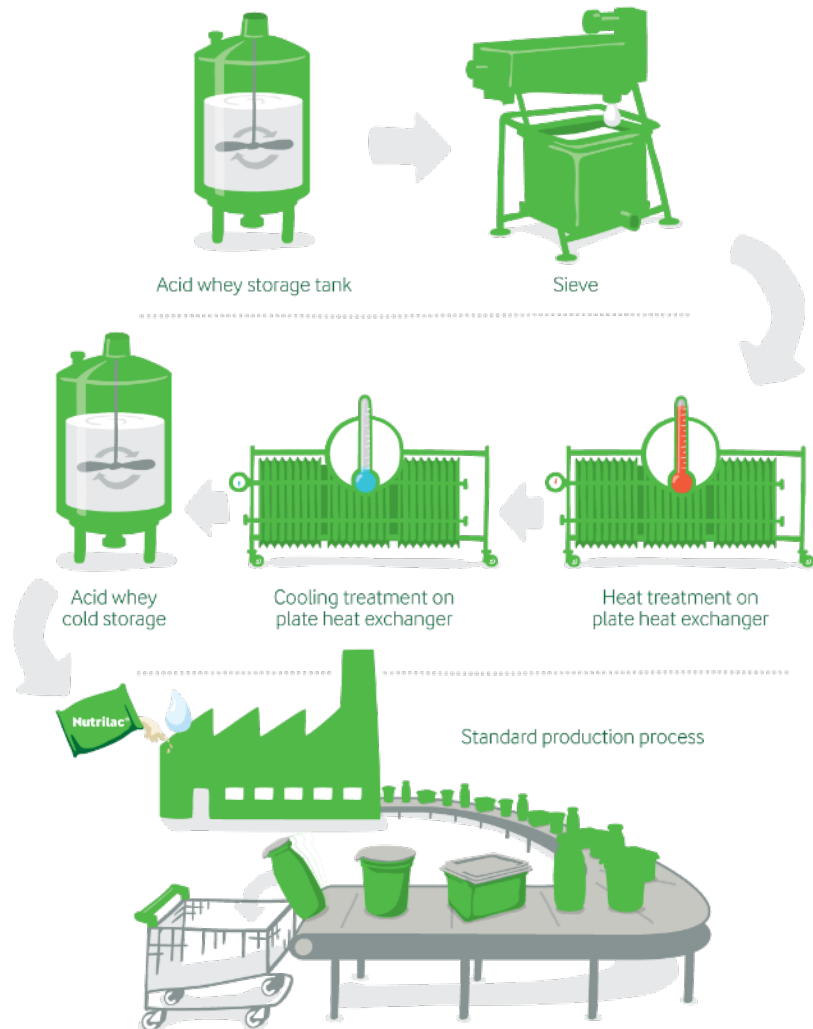


2 months  
at hot  
storage  
(40C)



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# How to handle your whey by-streams

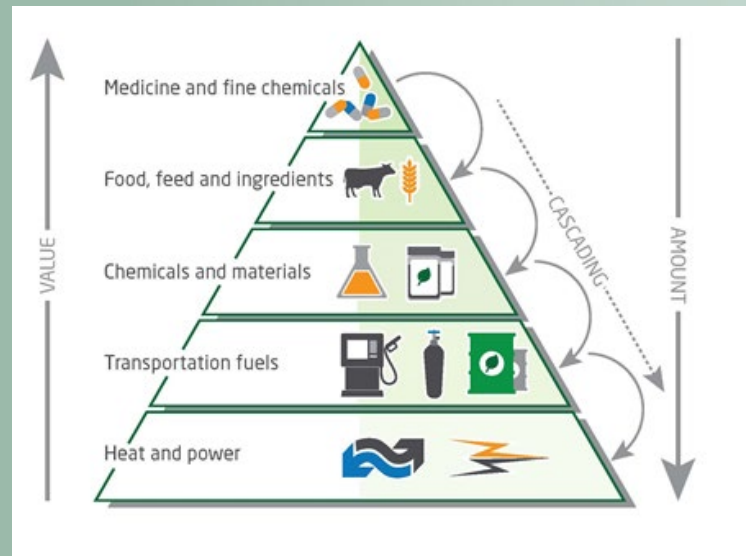
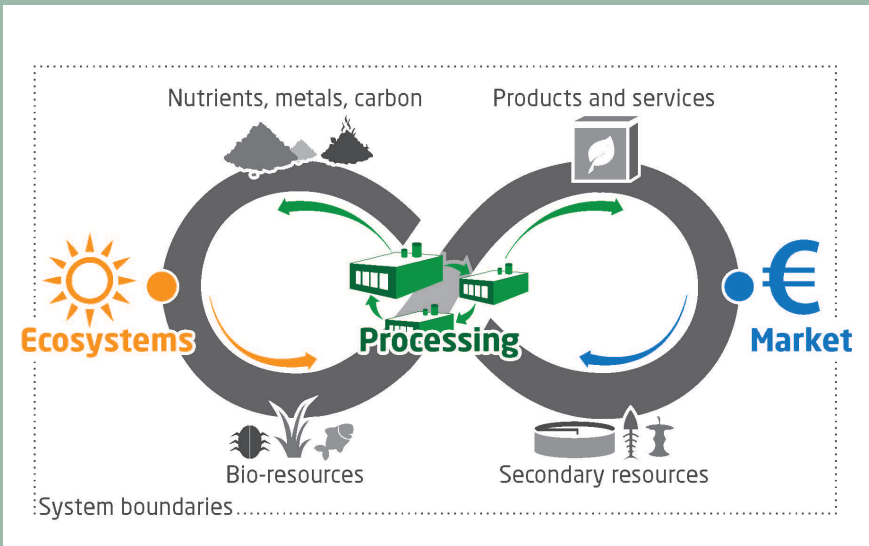


## Check list when handling the bi product whey

- ✓ The Handling of whey is similar to raw milk
- ✓ Heat treatment is executed at 72-74 °C in 15-20 seconds
- ✓ The whey must be cooled to below 6°C, Immediately after collecting the whey
- ✓ Storage in silo tanks must not exceed 2-3 days
- ✓ Acid whey from cottage cheese needs to be separated using a sieve/decanter before heat treatment

# VALORISE

## A Circular Bioeconomy for the Kenyan Dairy Sector





# Thank you!

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