



LIFE for Acid Whey

Reuse of waste acid whey for the extraction of bioactive proteins with high added value

Webinar on How to finance the greening of our food chain

SME Example from the LIFE Programme: developing greener products for waste reduction

24 March 2021



Project partners:

ARHEL



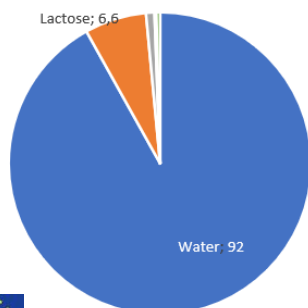
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INSTITUTE OF DAIRY SCIENCE & PROBIOTICS

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WHY WHEY IS A CHALLENGE FOR DAIRY INDUSTRY?

Production of 1 kg of cheese gives 9-10 L of whey!

- Whey represents 85-95% of dairy wastewater
- Total EU whey production estimated at 40×10^6 t/y
- Whey surpluses in the EU estimated at 13×10^6 t/y



Typical whey composition

- 92 - 94% water
- 3.2 - 6.6 % lactose (causes 100-time higher pollution potential compared to sewage)
- 0.05 - 0.5% fats
- 0.5 - 1.4% whey proteins (20% of milk proteins)
- 0.3 - 0.8% minerals
- Vitamins, growth factors



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LIFE for Acid Whey – LIFE PROJECT FOCUS

ACID WHEY

FRACTIONATION OF
LACTOFERRIN

BIOGAS

LACTIC ACID
BACTERIA AND
THEIR
METABOLITES

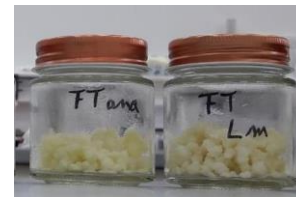
Find a solution for acid whey, which is less suitable for further use due to lactic acid and often ends up as waste.



Optimise a method for the separation of lactoferrin and lactoperoxidase & perform extraction on a demo level.



Take the rest of the whey to the biogas plant for biogas production.



Confirm applicability of protein depleted whey as a culture medium for dairy starter cultures, probiotics and their metabolites

ENVIRONMENTAL AWARENESS AND STRICTER LEGISLATION LEAD TO THE SEARCH FOR THE FULL USE OF FOOD PROCESSING BY-PRODUCTS



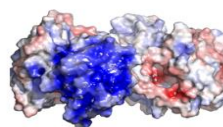
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TOWARDS NEW PRODUCTS & LESS WASTE

- Some whey proteins are applicable as dietary supplements & pharmaceuticals
- Whey can be used as a growing media to produce probiotics, prebiotics, active pharmaceutical ingredients, vitamins, etc.
- Possible use of whey proteins in covid-19 context

LACTOFERRIN
iron-binding
protein



Activity against COVID-19*

Bactericidal, bacteriostatic, antiviral, anti-inflammatory, immunomodulatory, antioxidative, antitumour, iron transport regulation, activity



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DEMOGRAPHIC CHANGES AND EATING HABITS DRIVE MARKET DEMAND AND OFFER PRODUCERS NEW OPPORTUNITIES

Increased demand for:

- Protein fortified food
- Nutritional supplements improving immunity
- Improved Infant formulas
- Fortified cosmetic products
- Pharmaceuticals based on whey proteins

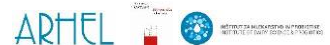


Bovine Lactoferrin market size in 2019 over 546 million \$

→ in 2027 the market is projected to reach nearly 950 million \$



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ACID WHEY & DIFFERENT END-PRODUCTS

Some produced whey fractionation and bioprocessing ingredients and potential end products:

Mixed and individual whey proteins



Immune support dietary supplement



Ingredients for specialised dietary products (milk formulas, protein fortified food)



Pharmaceuticals

Natural preservative



Dried lactic acid bacteria and their metabolites (oligosaccharides, biocins)



Prebiotics



Prebiotics

Natural preservative



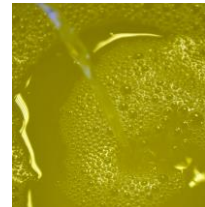
Lactic acid precipitate



Calcium dietary supplement



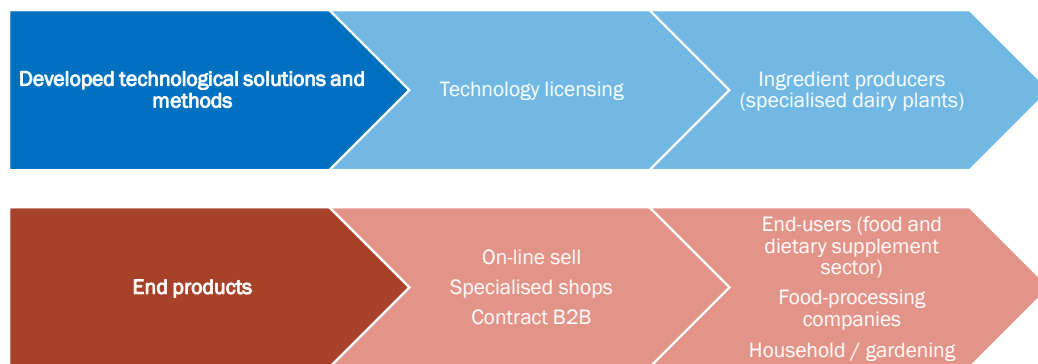
Culture residue after milk fermentation



Organic waste compost booster



CUSTOMERS AND END-USERS

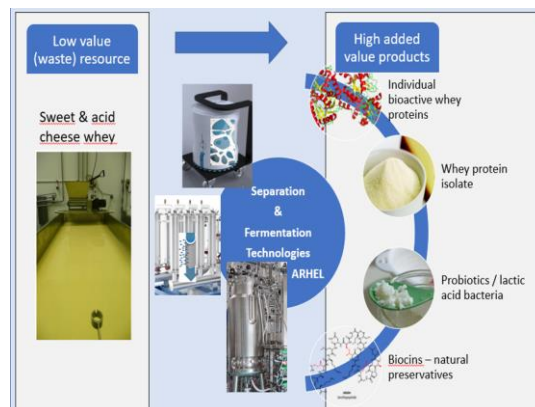


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ADDRESSING CHALLENGES ON THE PATH TOWARDS COMMERCIALISATION

- Optimization of technological processes (technical solutions, efficiency, cost optimisation)
- Testing and adopting final product(s) with end-users & customers needs
- Replicability and transferability analysis
- Investments into industrial-scale production line
- Upscaling production capacities



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TIPS FOR ENTREPRENEURS

TEST THE PRODUCT EARLY

Sending the obtained ingredients for testing to potential customers already in the development phase gave us an important feed-back regarding the direction of production.

APPLY FOR DEVELOPMENT FUNDS

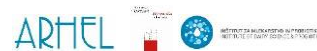
Project applications for funding the development (LIFE, national funds) have taken a lot of effort. At the same time, they helped us formulate the right strategy and keep up the pace of development activities.

CONNECT WITH RESEARCH INSTITUTIONS

Connecting with research institutions has accelerated development activities and contributed to increasing the range of innovative products.



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THANK YOU FOR YOUR ATTENTION

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