

The main ways of valorisation for cheese whey in the B-Resilient partner regions

The dairy industry is significant in the European Union. Indeed, Europe is one of the world's leading milk-producing regions, accounting for 25% of world production. The majority of EU dairy production is cow's milk, accounting for 96% of all production. Significant producers include Germany and France; together with the Netherlands, Poland and Italy, these five countries represent two-thirds of EU production. The EU exports a total of 1,38 million tonnes of cheese per year.

Cheese production is significant across several EU regions. Thus, B-Resilient partners decided to explore business opportunities offered by the valorisation of by-products of the cheese-making process, with a particular focus on cheese whey (the main by-product in cheese-making by volume). Amongst the EU regions covered by the B-Resilient partnership, the choice was made to limit the geographical scope of the investigations to Flanders, Galicia, La Rioja and Central Macedonia, each a significant player within their countries in various aspects. Indeed, cheese production in these regions is substantial, large volumes of cheese whey are available and its valorisation is being explored.

The study conducted by the B-Resilient partners covered a review of scientific literature available, data gathered through Mintel, an international database of product releases as well as interviews with nine organizations, including SMEs, large companies and two research centres.

By exploring the breakdown of the composition and biochemical properties of cheese whey, it was possible to better understand the uses associated with each component. This provided the starting point for the identification of the four main ways of valorisation of cheese whey today: (1) feed and agriculture, (2) food and nutrition, (3) energy and (4) industrial use.

The valorisation of whey in **feed and agriculture** is the most evident from literature. Indeed, this has been, historically, the easiest method to valorise cheese whey, notably due to proximity between cheese dairies and the field. The various forms of cheese whey have potential benefits in their use as animal feed.

Lactose, derived from cheese whey, has high energetic potential, and makes for an interesting feedstock for bioenergy production. Various integrated biorefinery plant projects are underway, and research points to this concept as a potential way to increase the range of value-added products made from cheese (whey), as well as a way to sustainably manage waste and other residual streams from production.

Cheese whey has a large range of potential benefits for use in the domain of **food and drink**, especially when concerned with nutrition. Indeed, the food industry has been using cheese whey as both a functional and nutritional ingredient for many decades, owing to its variety of

nutritional compounds (notably minerals and vitamins, but most especially whey proteins). The growing market for sports nutrition products is taking full advantage of the intrinsic nutritional qualities of cheese whey. Research points to multiple strength and muscle-protein synthesis advantages to the use of cheese whey proteins. Interviews from companies in the B-Resilient partner regions supports the evidence of the food industry being a major sector for the valorisation of cheese whey.

Other than in the domain of **energy**, cheese whey has interesting valorisation pathways to be explored in **industrial production**. Once again, it is the lactose derived from cheese whey that has high valorisation potential. Lactose in whey permeate can be converted to bioplastics, as well as several other polylactic acid-based polymers, with applications across various industries.

Cheese whey has been demonstrated to have a variety of potential pathways for valorisation, but these are not without their limits. Several of these have been outlined by companies during interviews, and many of these regional limits converge across the regions of the study. Main barriers are economic and logistical. Indeed, volumes of cheese makers are small, and recovery is costly, from the collection of whey to its processing and selling. Transport costs, as well as costs related to product stabilisation, make the valorisation of cheese whey more complex. The most interesting form of valorisation, supported by results from interviews, is the re-use of cheese whey in the food industry. The whey must be of the highest quality, void of contaminants and microbiological activity, but the variety of functional and nutritional uses of cheese whey means this valorisation pathway shows significant promise.

Would you like to receive more information about cheese by-products recovery in the regions targeted by the B-Resilient partners?

Please do not hesitate to contact with your local partner!



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