

## Circular Economy

The agricultural and food sector is at the centre of circular production cycles and the tradition of circular production is the daily experience in the dairy sector.

### 1. The roots of circular economy lie within the dairy and agri-food sector

Agriculture and dairy are based on circular production cycles and the dairy and agri-food sector has a long history within a circular economy. By using pasture land for feeding dairy cows, by growing crops on rotated pieces of land, by fertilising the land with animal's waste and at the same time keeping animals as a long-term stock of nutrients, the sector builds on the long and deep knowledge of humankind. Dairy cows have a unique ability to consume non-edible feedstocks and turn them into a very nutritious protein that humans can eat.

Additionally, cows are kept on land that cannot be used for agriculture, meaning that they help to maintain a landscape that would otherwise be inefficient, or unused for food production.

Manure from cows provides a reliable source of fertilizer that can be put back into the farm and their waste can also be captured and fed into anaerobic digesters, helping to curb methane emissions and produce a renewable energy source for the farm. Cows are a very efficient use of land and resources, as well as being a source of milk and natural fertiliser, and at the end of life the cow can be converted into a variety of products, such as beef, pet food, and leather goods.

While the "linear economy" has become predominant over the last decades, the dairy sector has never lost the fundamental circular economy mind-set despite its permanent adaptation to the changes in the economic system. Most, if not all of the materials, and resources that are utilised by the dairy sector are being used and re-used several times within the cycle or recycled to be put to other uses.

The concentration of production in favourable areas may tend to challenge this cyclical approach, and so for this reason, the search for new solutions is continuously on the agenda of actors in the dairy (and wider agribusiness) sector.

Take, for example, whey, a co-product of the cheese-making process; whey was once put onto land, or fed to animals (pigs), but is now being used as high-value protein concentrates for specific human nutrition (sports, infants, and the elderly) in a growing market, and in special cases, for young animal feed.

Agriculture and dairy not only serve as a fundamental guarantee for food security but as the essential basis for any economic development and, more importantly, for political stability. Agriculture and dairy play a crucial role when it comes to shaping the landscape, both from an environmental perspective and from an economic point of view. The European dairy sector is the economic backbone of rural Europe.



## Position Paper on Circular Economy

The dairy sector has more than 700,000 dairy farms across Europe and creates more than 300,000 industrial jobs especially in rural regions. In many parts of Europe, dairying is the only economically viable way for agricultural production. The European landscape is shaped by pastureland and our sector therefore fulfils a fundamental role, which cannot be assured in any other way, feeding materials, people and local economies in a natural Circular Economy.

## 2. Environmental hotspots in the dairy industry

The dairy industry is very conscious of the importance of a continuous improvement of the dairy chain's cycles. Clear aims have been made for more refined knowledge of hotspots and impacts are being further developed.

### Environmental Footprinting

One major project to understand more about the environmental hotspots of different dairy products is the Product Environmental Footprint (PEF) pilot, under the umbrella of the Commission and driven by EDA for the dairy sector: [more info on the Dairy PEF](#).

This project is developing a methodology and communication framework on environmental foot printing in a consortium of several dairy companies and associations, including an SME, farmers, retailers, and scientific and governmental bodies. The major outputs undergo a public consultation and need to be approved by COM, MS and NGOs to achieve full recognition.

The methodology is now nearly finalised with the testing phase of methodology and the communication yet to come. The main impact categories have been chosen and are closely followed by the dairy sector.

## 3. Caring for specific areas for improvement along the chain

### Energy

**Heat** is widely reused within the dairy industry. Some dairies have implemented a central ammonia based refrigeration plant with a high temperature ammonia based heat pump. Heat previously lost through the cooling towers is now used to create hot water for pasteurisation. This has not only enabled the recycling of heat within the dairy but has also significantly reduced water and gas usage.

**Anaerobic digestion (AD)** technology is another example of a closed loop system. By digesting trade effluent plus higher strength whey and permeate, AD plants feed energy back to the factory, cutting waste disposal and power costs. Bio-degradable fats and sugars are converted into biogas that generates renewable energy in a CHP (Combined Heat & Power) engine which is then used to power the dairy. Surplus heat from the CHP can also be used in the production process. Other dairies are also reducing their reliance on finite fossil fuels by producing renewable energy onsite which is then fed back into the production plants. This can be in the form of solar panels, wind turbines or biomass boilers using recycled wood pellets.

**Transport:** making efforts in logistics, and engines used, and choosing the best type of energy (e.g. from waste) make many options to always further reduce emission and use the resources of the dairy companies and the whole chain most efficiently.



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### Water as a most valuable resource

Water recovery and re-use is becoming increasingly common within dairy processing sites; innovative water treatment technologies such as reverse osmosis allows sites to recycle wastewater to reuse across the dairy from cleaning the filling lines to pasteurising the milk. Several sites in the EU have introduced this technology, which not only reduces the strain on local water supply but also reduces the overall carbon footprint of the site. Significant steps are also being taken to improve the quality of wastewater, reducing the impact on the water basins.

### The role of packaging

Packaging plays an important role for the dairy products, as it assures the safety and quality of the products. Many dairy products for consumers need to be kept refrigerated and thus need specific handling at production, in transportation and in the consumer's home. This can only be achieved with the right packaging that safeguards the products from external influences and remains as light and practicable as possible.

The design of dairy packaging needs to assure safety and quality as a non-negotiable baseline, and then also it needs to address, logistics, recyclability and many other criteria.

### (Solid) waste

Increasing recyclability of waste of packaging material and other material used in the company, but not food/ edible parts, is of course taken care of in the dairy industry since many years.

### Food wastage

Food waste is one major influence on the environmental footprint of dairy products and a major challenge to the circular economy. A key priority for the industry is to improve consumer education on appropriate storage methods and 'use by' and 'best before' date labels. Packaging plays an integral part in reducing food waste by keeping dairy products fresh and safe for longer. The dairy industry has an important challenge in optimising packaging to reduce food waste but also supporting options to increase recycling, reducing packaging waste and reducing the environmental impact of packaging (e.g. light weighting and increasing the recycled content).

The dairy industry is fully committed to further reduce food wastage and packaging waste along the chain ([see our EDA factsheet](#)).

### Valorising 'secondary' resources

Anything that can be valorised, even if not used as food anymore, should be a predominant goal before giving it to a waste stream. For example, former foodstuffs can be used as animal feed, as cosmetics or also industrial applications of dairy components are many of the options to not waste valuable resources.

### Reuse of other 'waste' components

Nutrient recycling from waste water treatment plants (on site), sludge from dairy processing, digestate (sludge output from a digester) e.g. from digesting manure or food waste (see above), is of outmost importance for a circular economy to function properly (whilst guaranteeing and safeguarding food safety and animal health).



### 4. Overarching view on circular economy

In an agricultural system all parts of the production cycle have an important role to play and need to be planned and protected for durability of the system – the overall circular approach in dairying thus not only includes aspects of the environmental dimension (see hotspots mentioned above), but also in full respect of animal welfare ([see our EDA factsheet on animal welfare](#)) and of the social and ethical dimension, even if these are not directly the target of the European Commission’s reflection on a circular economy.

#### Protection of the single market

The original directive’s dual objectives – to protect the environment whilst securing the free movement of packaging and packaged goods throughout the EU, as well as avoiding divergences in national policies – remain valid and must be maintained in any revised proposal. The free movement of packaged goods in the internal market is a fundamental principle of the EU.

### 5. The challenges of the dairy industry

A further challenge for the dairy sector regarding tightening the cycle is the continuous conversion/ change from a ‘product-based’ to a ‘services-based’ approach. The dairy sector not only provides products and their ‘calories’ to humans, but has an important role to fulfil with its service to human nutrition, to (regional and global) food and nutrient security, to European landscapes, to rural areas and their infrastructure and to keeping grazing areas in difficult regions thus lowering the impact on climate change.

The dairy industry is very aware of these challenges and is willing to seek support from the European Commission with its planned proposals for a circular economy.

