

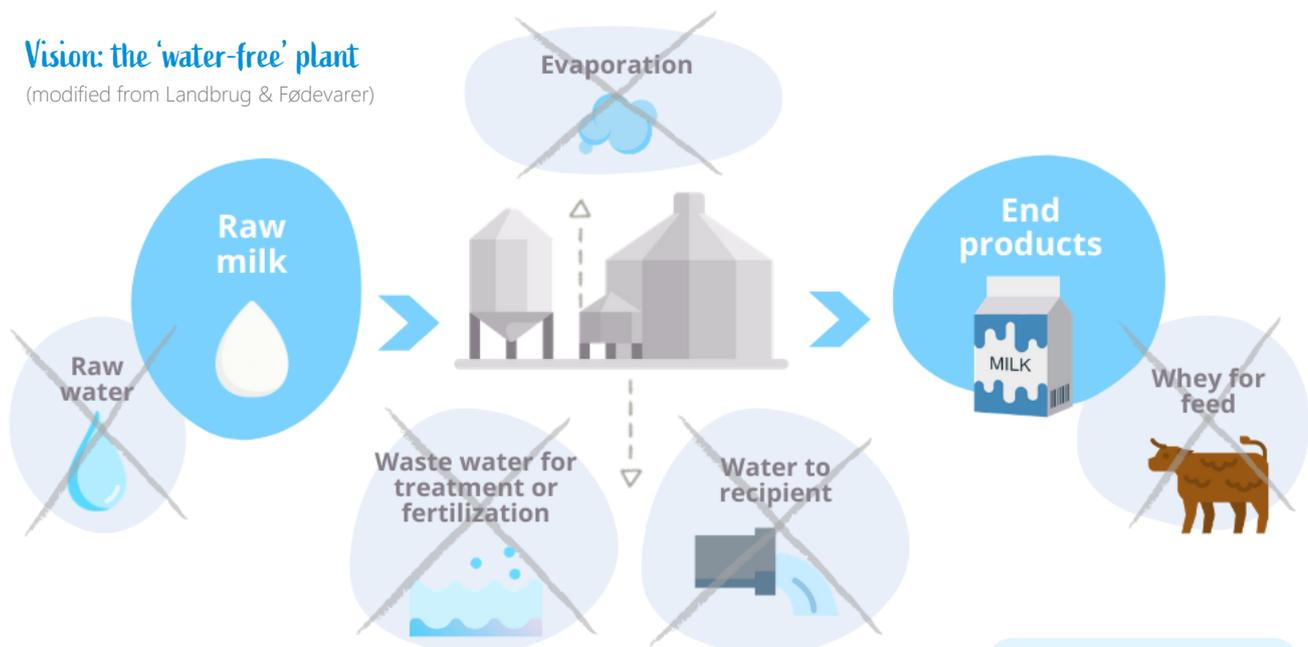
(Re)using water in the dairy sector

Ensuring food safety

Dairy processors are challenged to conserve water not only by reducing freshwater consumption but also by using measures to reuse water **without compromising on the hygienic quality and safety of the products (1)**.

Vision: the 'water-free' plant

(modified from Landbrug & Fødevarer)



Water reuse by the food industry refers to **internal water recycling (3)**. In non-food industries, water reuse can also refer to reuse of urban treated water, reuse of treated water from an industrial plant by another industrial plant or for other purposes such as agricultural irrigation, etc. While the food and beverage industries have already made significant progress in internal water recycling, **the potential for reusing water from external sources is currently limited due to health concerns** related to the use of recycled water in direct contact with food products (3).

It is therefore essential to keep a balance between the promotion of water reuse where relevant, and the safety of water reuse applications.

Environmental, economic and social benefits:

- Increased **resource efficiency** (nutrients recycling)
- **Growth and jobs creation** with development of innovative technologies and water infrastructure
- **Increased revenues (2)** in the agricultural sector



Reused water: water considered suitable for reuse has been recovered from a processing step, including from the food components, and that after subsequent reconditioning treatment(s), as necessary, is intended to be (re)used in the same, prior, or subsequent food processing operation (1).

Recirculated water: water or reclaimed water reused in a closed loop for the same processing operation (e.g. chilled water, condenser cooling water in circulation, pasteuriser cooling water in circulation etc.) (1)

Reclaimed water: water that was originally a constituent of food or removed from the food by a process step, or from water that has been in contact with food, and is intended to be subsequently used in food processing operation (e.g. permeate from reverse osmosis plant, condensates from milk evaporators) (1)

Recycled water: water, other than the first use or reclaimed water, that has been obtained from a food processing operation (e.g. CIP final rinse water etc.) (1)

Regarding reused water used in processing or as an ingredient, food safety should never be compromised. According to Regulation (EC) 853/2004 laying down specific hygiene rules for food of animal origin, **water used in food processing must be of a quality that is safe and suitable for human consumption**, thus not compromising on the hygienic quality and safety of the products.

When water reuse in the food industry is allowed, provided it satisfies food safety obligations, **a validated and verifiable systematic food safety management tool** such as the Hazard Analysis and Critical Control Points (HACCP) system is required (3).

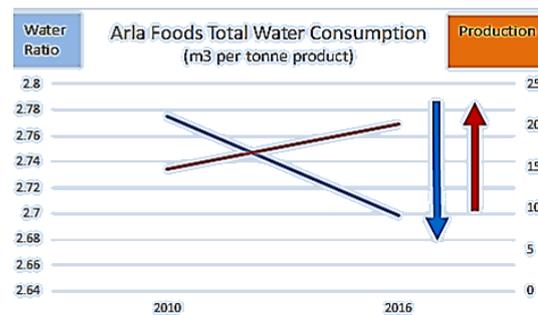
Examples of water reuse actions and ideas

Danone is investing around €2 million to install a wastewater treatment system for its 'Tres Cantos' yoghurt and dairy products facility near Madrid (9). The sustainability project is carried out over three years.

By the end of 2019, the plant will be self-sufficient in supplying 80% of its water needs (10).

60 %
reduction of water consumption in factories by 2020 baseline

ARLA (5)



DMK reduced its annual fresh water use of 3.3% between 2015 and 2016. Within that year, the company started using more of its own water from the groundwater well while reducing its consumption of external water from the municipal water supply (4).

-3.3 %

Fresh water consumption



-8 %

External water from municipality



+6.5 %

DMK water from groundwater well



Between 2010 and 2016, Nestlé managed to reduce of 26% the volume of water to withdraw. During the production of powdered and condensed milk, the whey is removed by evaporation, and further transformed into clean water for reuse in plants' cooling or cleaning processes (6). Nestlé has expanded its dairy processing site in Jalisco, Mexico, transforming it into the company's first 'zero water' manufacturing site in the world, meaning that the plant does not use any local freshwater resources for its operations (7).

Water withdrawn (m ³ per tonne)	2010	2016
Milk products and ice cream	5.5	4

At FrieslandCampina, two production facilities will start supplying their residual water directly to the Water Board as from late 2017. The Water Board invests in the construction of a purification system to extract 'NEO alginate' from the residual water. 'NEO alginate' is a sustainable raw material offering various options for applications in agriculture, the construction sector, etc. (8)

European water legislation

According to EU legislation, water intended for human consumption includes all water used in any food-production undertaking for the manufacture, processing, preservation or marketing of products or substances intended for human consumption (11). The Water Framework Directive (WFD) is the main framework for EU water policy. It is complemented by other legislation regulating specific aspects of water use. Being a directive, it is transposed into the member states' internal law for application, leaving national authorities' competence as to form and means.

As confirmed by EU Commission's Work Programme 2018, the European Water Policy is undergoing a restructuring process via the planned REFIT revision of the Drinking Water Directive (DWD) and a proposal for a Regulation on minimum quality requirements for reused water, within the Circular Economy Action Plan (12).

BREF

The Best Available Techniques (BAT) reference documents, the so-called BREFs, are industrial benchmarks for different kinds of emissions from manufacturing sites that were developed by the EU authorities. They have been drafted as part of the exchange of information carried out in the framework of Article 13 (1) of the Industrial Emissions Directive (IED, 2010/75/EU) (13).

The Food, Drink and Milk BREF is currently under revision and includes a chapter on emissions to water.

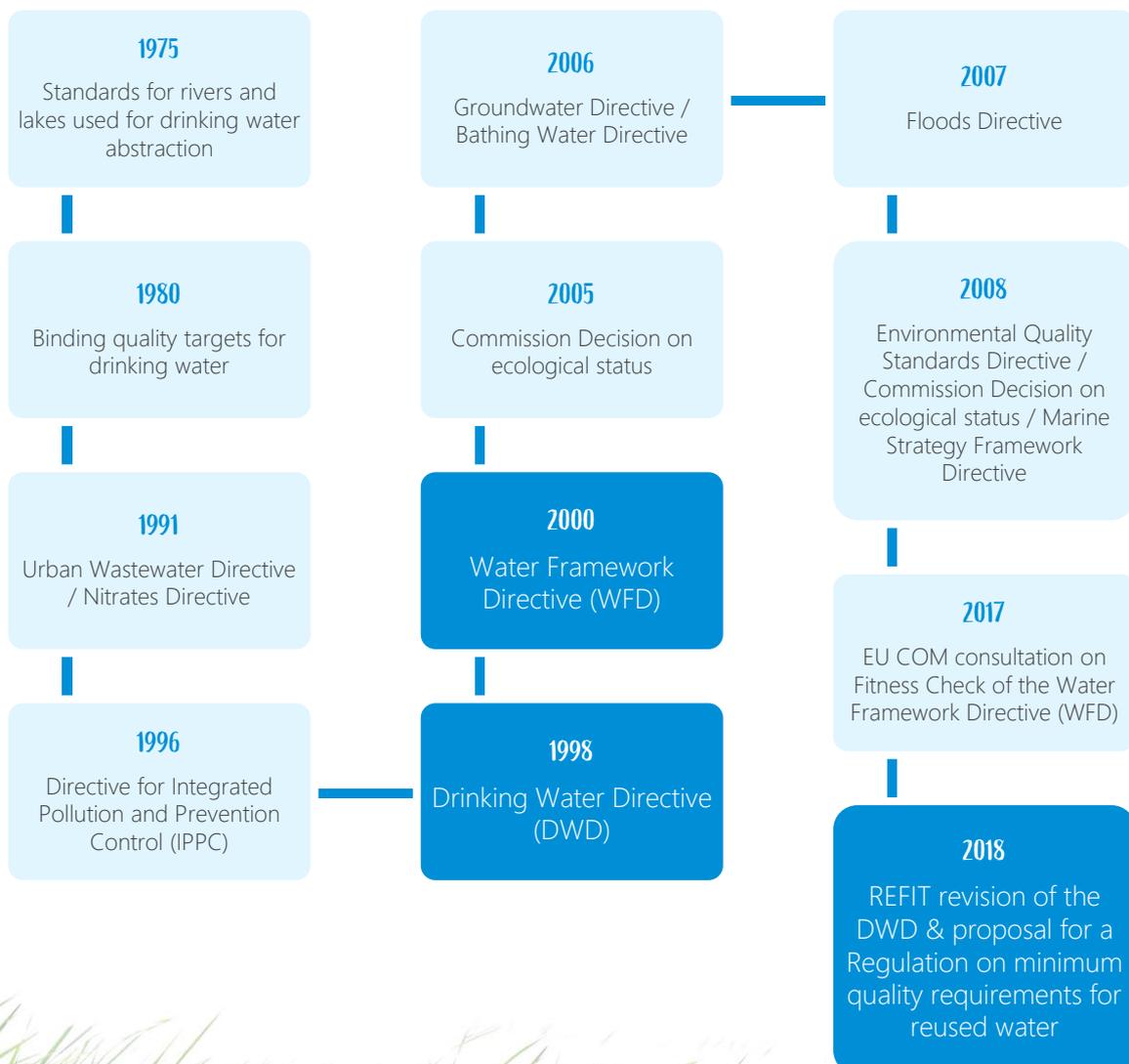


International standards related to water

Principles, requirements and guidelines for the assessment of a water footprint are defined in the ISO 14046 document (14). By its position under the ISO Technical Committee on LCA, the scope is limited to processes and products and aligned to the LCA methodology as formulated in other ISO standards in the LCA field (15). As per this document, a 'water scarcity footprint' and a 'water availability footprint' assess impacts associated with water use only, whereas a 'general water footprint' assesses all relevant impacts related to water (14). ISO standards on water reuse are also under development, following a request from Japan, China and Israel (3) (ISO/TC 282 committee on Water reuse (16)).

For the dairy sector the International Dairy Federation (IDF) prepared ['The IDF Guide to Water Footprint Methodology for the Dairy Sector'](#).

Timeline of European water legislation



References and further reading

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European Dairy Association

eda@euromilk.org

@EDA_Dairy

