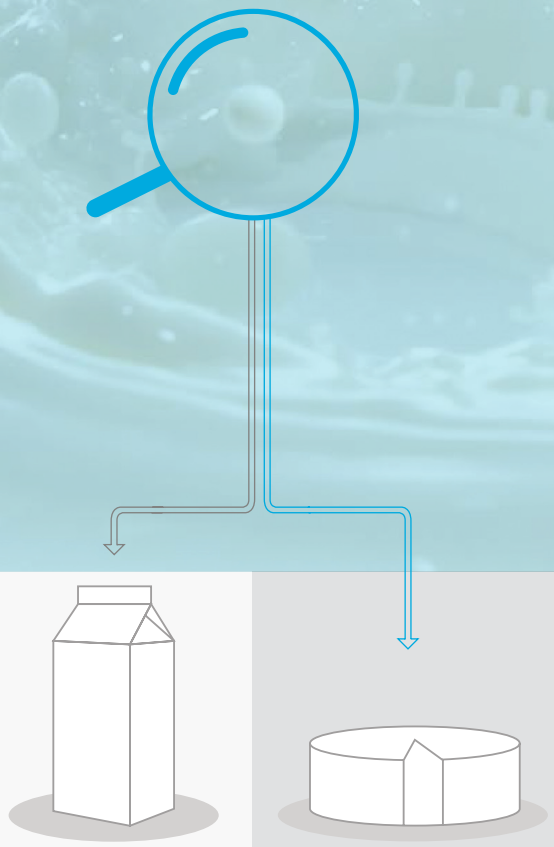
MILKYWAY

More cheese from less milk: eco-innovative real-time milk classification technology for optimized milk use and for reduction of the environmental impact of dairy production.



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THE ENVIRONMENTAL IMPACT OF DAIRY PRODUCTION CAN BE REDUCED WITH A OPTIMIZED MILK USE

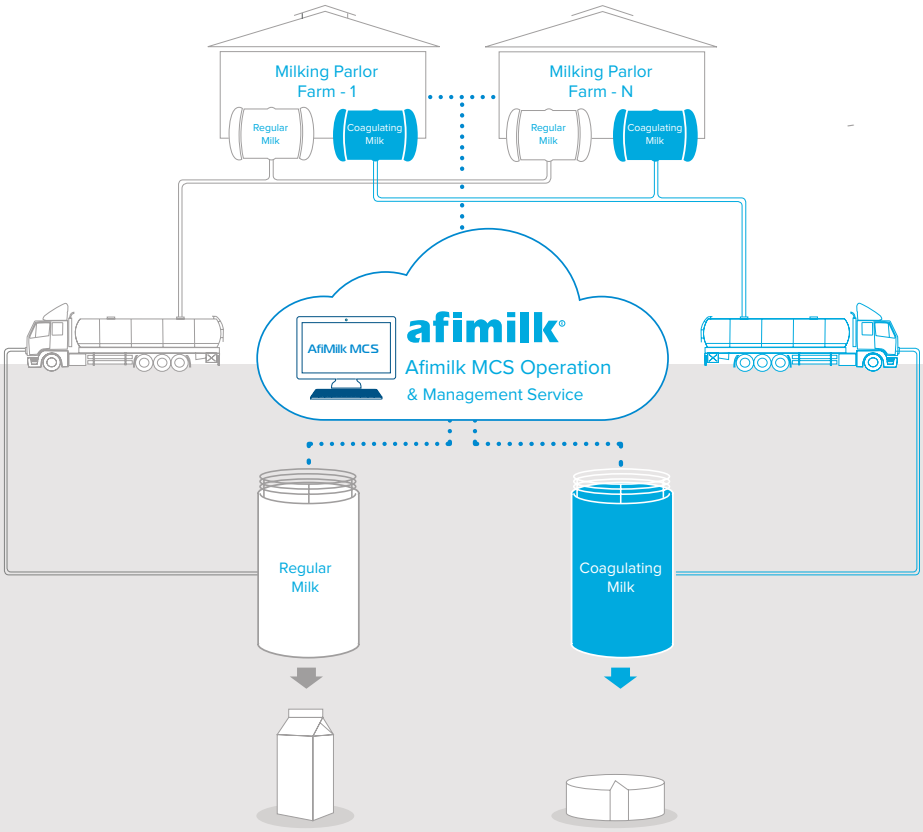
The Milky way project, co-financed in the context of the European Union eco-innovative projects, aim to reduce the environmental pollution arising from the production chain related to the milk transformation. This project is based on MCS technology patented by Afimilk and allows to recognize during the milking phase, the milk's quality and to separate the milk itself on the basis of the curdling attitude or other parameters decided by end-users.

The MilkyWay system, as it has been conceived in the origin, allows to separate the milk with higher presence of components needed for the transformation in cheese granting the same quantity of cheese using less quantity of milk; moreover, in the remaining part of milk (the one not separated) there are less proteins and fats, so that it can be used, with few adjustments, as milk for direct consumption. (milk to drink).

WHO CAN BE INTERESTED IN INVESTING IN THIS PROJECT

The main users of this system are the farmers without any doubt, but the environmental and economic benefits are attributable to the dairy farms; that's why the main subjects to which this project is proposed are the dairy farms themselves. All the subjects involved into the production chain will benefit of the economic advantage related to the cheese yield increase and besides, the environment itself will benefit. The area in which this technology has been introduced is the Italian market, where three systems have been installed in Sardegna in addition to the experimental systems.

The commercialization of this system concerns the european market, through strategic partnerships with technicians and maintenance workers which are already on the market. In particular, the countries in which an agreement with local staff has already been defined are: Italy, Bulgaria, Denmark, Greece, Macedonia, Czech Republic, Romania, Hungary.



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PURPOSES OF MILKY WAY SYSTEM

The considerable advantage of the Milky Way system is that it is not required to realize new installations, but it is possible to modify and adapt the existing ones to this new technology. Moreover using a “better” milk with less quantity, reduce the energy consumptions related to the dairy industry and therefore the pollutant emissions. The adoption of this sytem allows to separate the milk directly in the farm stocking it into two differents tanks which differ on the basis of the milk’s intended use. This is not about new machines to be installed into dairy farms, but only about a better choice for raw materials, a milk optimized according to the intended use, both for the cheese and the drinking milk.

WHY IS WORTHWHILE TO USE CLASSIFIED MILK

One of the greater benefits of the Milky way system is the cheese yield increase. This means that starting from 100 kilos of milk you produce around 10 kilos of cheese with separated milk instead you can produce about 11 kilos. The economic advantage is evident (higher production with lower costs), the environmental advantage is less evident, but easily explainable. With this system you can obtain a greater quantity of cheese starting from the same milk quantity, which means you can have a cheese production increase of around 12% without increase the number of cows and consequently without increase the quantity of processed milk. A smaller number of cows means a lower land-use for the production of fodder dedicated to the feeding of the cows, a lower use of water resources, lower emissions of pollutant gas related to the farming and lower quantity of manures (therefore pollutant) to distribute on the fields.

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EVEN THE FEEDING HAS ITS OWN IMPORTANCE

Thanks to the collaboration between NUTRISERVICE (feed manufacturer) and UNICATT (one of the most important Italian university) all paramteres related to the cows feeding have been optimized to improve the production and maximise the quantity of protein useful for the cheese making. Thanks also to these studies, we have the possibility to reduce the polluting present in animal manures and arising from food displacements (not everything eaten by cows is transformed into energy and components useful for milk). From this partnership a protocol of “dairy cows’ correct feeding” has been drawn up and it can be used to improve the quality of classified milk.

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ENVIRONMENTAL BENEFITS

In this ever-expanding world, in which the demographic development leads to satisfy an ever increasing demand of food, the Milkyway technology aims to obtain a production increase without engaging new resources, but above all without inscreasing the pollution or resource's exploitation; All of this is obtained simply by separating the raw material (milk) at the origin. Such technology will help the European Union countries to comply with the Kyoto protocol reducing the polluting emissions

The ILCD 2011 Midpoint v1.05 characterisation method (European Commission, Joint Research Centre, Institute for Environment and Sustainability, 2012) was used to assess the environmental impact of the cheese. The impact categories of main interest for the agricultural sector were analysed: climate change (kgCO2eq), photochemical ozone formation (kgNMVOC eq), acidification (molc H+ eq), terrestrial eutrophication (molc N eq), freshwater eutrophication (kg P eq), marine eutrophication (kg N eq), land use (kg C deficit). The LCA analysis highlighted that the use of the MCS allowed to reduce the environmental burden of cheese production. The reduction ranged between 8% and 9% for all the impact categories when a kilogram of cheese with a standard content of 31,3 g fats/100g and 26,8 g proteins/100g was considered as functional unit.

	"Cheese from non-separated milk"	"Cheese from separated milk"	Difference %
Yield	10,14%	11,43%	+12,7%
GPL (l/kgcheese)	0,21	0,19	- 9,5%
Water (l/kgcheese)	38,4	34,1	- 11,2%
Electric energy (kWh/ kgcheese)	0,38	0,33	- 13,1%

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ITALIAN REALITY:

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www.cissva.it

www.mila.it

www.afimilk.com

www.consorziodaq.it

UNIVERSITÀ CATTOLICA del Sacro Cuore

www.unicatt.it

www.nutriservice.it

www.tdm.it

MILKYWAY CONSORTIUM

The project is managed by a consortium composed of 7 partners covering the whole production chain related to the milk transformation, from the producer to the dairy factory:

DELLA BONA FAUSTINO E C. S.S. farmer businessman, has made available his farms for the installation of the system and for checking the results related to the feeding

CISSVA Producers cooperative with milk transformation system, it has taken part directly transforming the milk produced in two associated farm companies creating " Il graffio", a medium aging cheese produced with classified milk

MILA Producers cooperative with milk transformation systems, it has taken part in several outreach activities of the project

AFIMILK Producer of electronic system for milking sector providing technology and technical assistance

DAQ health expert and animal welfare, they verified the health status of the cows and the quality of produced milk.

UNICATT Italian University, asked to optimize the cows feed ration and evaluate the beneficial effects of this new technology on climate

NUTRISERVICE (TDM); Milking equipments, feed producer and consultant in dairy cows feeding, it has taken part by installing and upgrading the milking equipment managing also the mainteinance.

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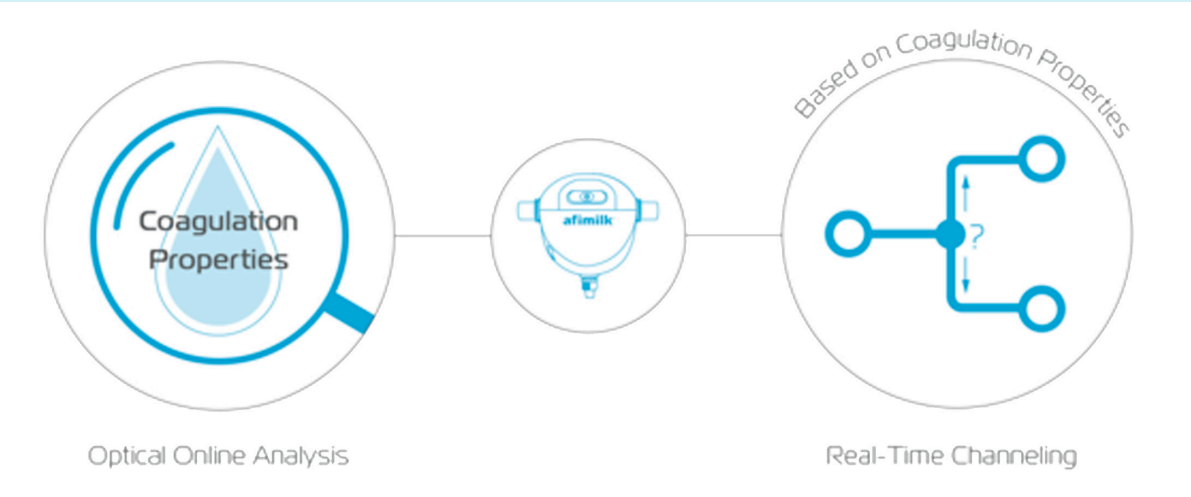
HOW THE SYSTEM WORKS

The system is composed of pedometers applied to the cow's leg allowing the animal identification each time it enters the milking parlor and evaluating its heat. The computerized system matches the milking stall with the recognized animal's number and register all the data related to the health and production which are transmitted by electronic milk meters and by the milk analyser; All data are stored up in a herd management software.

Milk is analysed instantly during the milking phase, an electronic system register all data evaluating the quality properties and according to the latter , the milk itself is driven inside two different storage tank.

The system recognises and analyses the milk produced by every single cow, managing the classification parameteres on the basis of the quality values you want to obtain; higher quality means higher yield. The system will allow farmers to obtain an higher quality milk and the dairy farms will save up resources and emit less pollutants during the milk transformation. The milk pipes, inside the milking parlor, are doubled to allow the separation of two types of milk soon after its analysis; The milk passes from the udder through a milk meter and successively inside an analyser (Afilab) which evaluate the milk quality parameters; if the quality is compliant, a valve system drives the milk in one tube or another. From the tanks inside the milking parlor (milk receivers), the milk is driven into the respective cooling tank for the storage until the moment of the collection. The innovation of this system lies in the fact that the milk doesn't suffer any kind of manipulation, it is simply separated according to the criteria set into the system.



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