



5th EUROPEAN AWARD FOR
COOPERATIVE INNOVATION

European Award for Cooperative Innovation

The Finalists & Winners

“Recognising sustainability-driven innovation in the
agri-food, fishery and forestry sectors”

Organised by:



Sponsored by:



SUMMARY

ABOUT THE AWARD

4

ECONOMIC VALUE CREATION

6

INNOVATIVE PRODUCT

Llet Nostra Alimentaria S.L. -Cooperativa Baix Empordà,	6
Cooperativa Cadí, Infrusec, Miel Muria y Masachs	10
 Okręgowa Spółdzielnia Mleczarska W Piątnicy	14
San Lidano Soc. Cop. Agric.	14

SUPPORT TO FARMER-MEMBERS

AGROCAT, Agropecuària Catalana S.C.C.L.	19
Dairygold Co-Operative Society Limited	25
 Glanbia	30

TRACEABILITY AND CONSUMER INFORMATION

 Association of Belgian Fruit and Vegetables Cooperatives	36
Atria	39
Caves de Rauzan	41

ENVIRONMENT VALUE CREATION

45

BIOECONOMY & CIRCULARITY

 Càmara Arrossera del Montsià i Secció de Crèdit, S.C.C.L.	45
Caviro	48
SODRA	52

NATURAL RESOURCES AND BIODIVERSITY

 Lantmännen - Thermoseed	56
National Federation of Group Water Schemes	59
Stylis Olive Producers Cooperative	63

SOCIAL VALUE CREATION

68

 Mans - E.I. Xarxa Agrosocial, SCCL	68
FRS - National Co-Operative Farm Relief Services Ltd	72
Spółdzielca Mleczarnia Spomlek	74

ABOUT THE AWARD

Cogeca's European Award for Cooperative Innovation aims at recognising outstanding cooperative innovation in the agriculture, food, fishery and forestry sectors. The award was presented in 2009, 2012, 2014 and 2017. 2020-21 marks the launch of the fifth edition of the award. The award is an initiative to promote innovative practices, projects and/or services provided by cooperatives and boost innovation in the sectors.

Through innovation in the fields and categories chosen for each edition, the award ultimately aims to promote actions that:

- provide cooperative members with value;
- develop new markets;
- promote new products and services provided by European cooperatives.

The award also seeks to promote an exchange of best practices and knowledge transfer and to encourage the qualitative development of innovation processes – all of this for the benefit of farmers, EU citizens and the environment.

THE MAIN FOCUS OF THE 5TH EDITION

The 2020-21 edition focused on sustainability-driven innovation. Creating new market outlets, products, services or processes driven by economic, social or environmental objectives is indeed critical in the current market and political environment. The award therefore aimed to recognise outstanding innovation and value creation that actively integrate sustainability considerations (economic, social and environmental) into cooperative enterprise systems, from conceptualisation through to research, development and marketing. Products, services, projects, programmes and technologies, as well as new business models and organisational/governance structures were invited to be presented and participate in the award.



ECONOMIC VALUE CREATION

INNOVATIVE PRODUCT

ECONOMIC VALUE CREATION

INNOVATIVE PRODUCT



Llet Nostra Alimentaria S.L. -Cooperativa Baix Empordà, Cooperativa Cadí, Infrusec, Miel Muria y Masachs - Els Músics - Cooperation as a driver of new product development

Summary

The project brings together 500 small and medium producers of dairy, nuts and a cottage cheese called mató, a type of traditional Catalan cheese. The innovation has pooled knowledge, tradition, and production capacities to create a new concept: Els Músics. An innovation that has brought together the partners of the project to innovate in the cooperatives' processes to establish this first intersector collaboration in the Catalan primary sector. An innovative initiative that brings economic value to our structures, and social and environmental value to the territory.

For the first time, Els Músics offers the consumer mató, honey and toasted nuts in the same package. It is a package ideal for

all occasions that does not compromise the naturalness and organoleptic characteristics of its ingredients.

In addition, Els Músics, has important nutritional properties that are intrinsically linked to a typical Mediterranean diet and that are ideal for a healthy lifestyle. This snack is inspired by and therefore takes on the name of the traditional Catalan dessert, Els Músics, which is based on toasted nuts. Now we complement it with other agri-food products typical of our land.

This collaboration of different entities in the primary sector offered the possibility to add value to our products, work, and culture.

Cooperation as a driver: "We can affirm that we have established an innovation in our own organisational model, with a strategic policy based on cooperation. We, as cooperatives, are aware that this initiative would not have been possible to carry out individually".

The following objectives were achieved through this cooperation:

1. More added value for our products

Each partner produces its products separately according a high-quality standard. Together, the partners have created a new way of consuming their core products without sacrificing their qualities. Combining them has generated greater value than the sum of its individual components. Value that translates into nutritional benefits, flavours and an experience that the consumer appreciates.

It is a product with a unique combination of agri-food ingredients and a high nutritional value that falls within a Mediterranean diet and a healthy lifestyle.

2. It promotes the culinary tradition.

Els Músics promotes the tradition and culture of the territory because it is based on local products and a traditional Catalan recipe. "Together we promote our country's culinary culture".

3. Improvements in terms of efficiency in the business structures

Els Músics has encouraged the partner entities to innovate. Improvements have been made to the production chains to boost their efficiency such as a new production line or investment in new machinery.

4. It improves commercial coverage

Cooperation has also meant the addition of distribution channels for all partners so that the new brand can see its own points of sale increased.

6. Planning ahead

This cross-sectorial partnership agreement has a clear intention to look ahead to the future. It opens the door for future development of new product proposals on the same basis or with other collaboration agreements. It is about taking advantage of the structure devised, cooperation and the trust achieved.

7. Sectoral pride

The project partners belong to different productive sectors and come from very distant territories. That is why we gave four launch presentations at different locations where the producers of the different cooperatives met. They were thus aware that they were participating in a global project that went beyond their sector and territory but at the same time shared common objectives, values and difficulties.

“With Els Músics we are innovative in product and, thanks to the intersectorial cooperation, we promote the Catalan countryside and our traditions.”

Jordi Riembau, livestock farmer and president of Cooperativa Ramaders Baix Empordà

8. Loyalty to cooperatives

This project has generated loyalty to the associated producers. Cooperative partners are proud to belong to an entity seeking new ways to grow and market their products and to add value to their work.

9. Development and maintenance of rural areas

Motivating an economic and value-adding initiative in the primary sector helps to maintain the population in these territories. In turn, if it is an agricultural activity, it is also involved in the maintenance of the landscape and the biodiversity of the natural environment.

10. First public recognition

This cooperation effort has already received its first public recognition: Sabor del Año 2020 (Taste of the year), Top innovation, in Spain. A leading quality seal in the Spanish food sector, the only one based exclusively on the organoleptic qualities of the product and tested by consumers without any reference to brands.

Background innovation - Intended purpose

For the first time, Els Músics offers the consumer mató, honey and toasted nuts in the same package. Ideal for all occasions without comprising the naturalness and organoleptic characteristics of its ingredients. Furthermore, Els Músics, has clear nutritional properties that are closely linked to a typical Mediterranean diet and that are ideal for a healthy lifestyle.

This snack is inspired by the traditional Catalan dessert “els Músics” and is based on dried fruits. Now we complement it with other agri-food products typical of our land. This collaboration between different entities within the primary sector offers us the possibility to add value to our product, work and culture.

The innovation

Over the course of two years, the partners developed the initial idea while searching for possible additional partners until it became an economic activity thanks to a specific agreement between entities within the primary sector. The partners are cooperatives from different sectors (milk, honey and dried fruits) that make up more than 490 small and medium producers in the Catalan countryside.

The members of the intersectorial agricultural-livestock agreement have escaped the competition between parties and embraced loyal collaboration and

synergies to seek new ways of consuming the food we produce.

“We are small companies that do not have specific innovation departments, but we do have our own knowledge assets which, when pooled together, become “a great asset”. We have organised and coordinated ourselves in such a way that each one of us contributes with our structure, experience, resources, knowledge, tradition and quality product”.

We are individuals who are used to cooperating. Be it with producers like ourselves, with neighbours and, if necessary, with the whole town to fight forest fires, floods or other emergencies. The spirit of cooperation defines us and is what gives us strength every day.

Things come out best naturally and when one puts in the effort. Our resources emerge from our environment and with our tradition we are able to bring out the best in them.

Quality is what brings value to what we do. It sets us apart, which is what the final consumer looks for when eating our products.

Territory: “We are from the earth. We are part of the landscape. But we are also responsible for the creation and maintenance of the environment around us. Our present and future as producers and people depend on our environment.”

Our products are synonymous with tradition, the basis of our gastronomy and our culture. In the primary sector, we are not fully aware that we are not only producers of food but also of culture.

This partnership among cooperatives has four main objectives:

1. To enhance the value of the agricultural sector

It promotes the activity in the territory and of the companies in the sector. The objective is to help small and medium producers to continue their work, which is what they do best: produce food for the population.

2. Develop and explain the territory's quality products

Do not abandon the tradition of food production, but grant it the value that it represents. Communicate that behind our products lies work, effort, tradition, culture and quality.

3. Create collaborative links between primary sector producers

Despite coming from different agri-food production sub-sectors, the four entities involved in the agreement share values and ways of doing things. This is a well-founded starting point that makes it easier for us to complement each other in order to develop a new activity.

4. Making known the values we share

“We are what we do, and we do this based on our values”. These values define us and make us stand out. Making the values known through new products is the best way to showcase farmers and their work.

The Els Músics' production process requires very careful coordination between the parties involved. Infrusec carries out the selection of the nuts and proceeds to package them inside the top part of the container. Miel Muria packs its honey in individual sachets. The Llet Nostra cooperatives produce the milk and Masachs develops the maté. During the whole production and distribution process, efforts are made to ensure that the food retains its original organoleptic properties in terms of taste, texture and appearance. Their quality and food safety are also guaranteed. Thus, all the work, food safety and quality requirements are met.

This product is inspired by our culinary tradition and fits perfectly within a healthy lifestyle and diet. In addition, tasting it becomes a moment of personal pleasure.

For the first time, the same individual packaging combines toasted nuts, the basis of the traditional Els Músics dessert, with two ingredients that are equally as traditional and rooted in the Catalan gastronomy: honey and maté. According to tradition, the dried fruits were given as food to the musicians and actors when they went from town to town to participate in the major festivals. They kept them in their pockets and snacked on them during the performance.

Nowadays, Els Músics is the traditional name of this dessert that is eaten after dinner with family and friends. This tradition has inspired our project and conceptualised our product and name.

The three Els Músics ingredients are quality products, developed over time and according to tradition by our entities. They are well known and appreciated by the Catalan consumers who recognise their origin, their properties, their combination and the territories where they are produced. In addition, all three have outstanding nutritional qualities.

The Els Músics packaging allows the three ingredients (nuts, maté and honey) to be kept separate. 90 grammes of maté are kept in an aluminum thermosealed container. A transparent bell shape containing 20 grammes of toasted nuts, hazelnut and almond is placed on top. The aluminum thermoseal prevents the humidity from the refrigerator from penetrating. Between the container and the bell, there is a sachet containing seven grammes of honey. In this way, the three ingredients are kept separate and their original organoleptic and nutritional qualities are preserved until the moment of consumption. Thanks to this compact packaging, this product becomes a new dessert proposal - an ideal snack to be consumed at any time and anywhere, without compromising quality, taste and tradition.

Value Creation

After designing and implementing the coordinated production system of Els Musics, the partnership is currently in the first phase of commercialisation. It is worth noting that this represents innovation in our own organisational model with a strategic policy based on cooperation. The collaborating partners are aware that, individually, neither this initiative nor the following milestones would have been possible:

With this innovative cooperation, the partnership has generated a new way of consuming our product without sacrificing its qualities. Combining the products has generated greater value than the sum of the individual components. Value that translates into nutritional benefits, flavours and an experience that the consumer appreciates.

Els Músics is an innovation because it is the first time that the primary produce is presented with this packaging and combination of food products. Els Músics has encouraged the partner entities to innovate. Some of the partners have made improvements to their production lines to boost their efficiency, such as a new production line or new machinery. The cooperation has also led to additional distribution outlets for all those involved. In this way, it is now possible for all brands to be present at more points of sale than before the agreement.

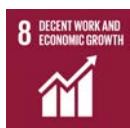
This intersectoral cooperative agreement opens the door to the development of new product proposals based on the same concept or on other types of collaboration agreement. It is about taking advantage of the structure devised, cooperation and the trust achieved.

This project has also generated a loyalty among the members towards their respective cooperatives. The cooperative members are proud to belong to an entity that seeks new ways of marketing and distributing their products.

Moreover, encouraging any economic initiative and the development of the primary sector helps to maintain the population in these territories. In turn, if it is an agricultural activity, it is also involved in the maintenance of the landscape and the biodiversity of the natural environment.

This coordination effort and sharing of values and objectives, has already been recognised in public through the Taste of the Year Award, Top Innovation 2020 in Spain. A leading quality seal in the Spanish food sector, the only one based exclusively on the organoleptic qualities of the product and tested by consumers without any reference to brands.

SDGS:





Okręgowa Spółdzielnia Mleczarska W Piątnicy



Summary

With innovation, OSM Piątnica increases the sustainability of its production processes. As a major producer of cottage cheese, curd, cream cheese or yoghurt, the cooperative has plenty of their by-product – whey. Traditionally, whey would be dried into powder and sold on the mass market generating very little income. Looking for alternative ways to monetise its whey, Piątnica isolated its most valuable ingredient – whey protein – and used it to create a fresh whey protein consumer cocktail. The profitability of the cocktail considerably exceeds the profitability of the powdered whey, which has a positive positively Piątnica's ability to pay a premium price for milk to its members.

Piåtnica's innovative cocktail contains fresh and unprocessed whey protein. It is the first and only such product on the Polish and perhaps even on the European market. Whey protein has an beneficial effect on human health due to its nutritional and regenerative value as well as its antioxidant and antibacterial properties. A single portion contains only 227 kcal, a small amount of fat and carbohydrates derived from natural fruit, purée or juice. It is available in three tasty flavours. One bottle of the whey protein cocktail contains 28 grammes of protein and 307 mg of calcium, which covers 56% and 38% of the nutrient reference values (NRV) for the average adult, respectively. Contrary to the powdered whey protein available on the market, Piåtnica's cocktail comes in an easy-to-eat form and does not require any preparation.

Until now, whey protein was available on the market in the following three forms: whey protein isolate (WPI), whey protein concentrate (WPC), whey protein hydrolysate (WPH). They are all in powder form, highly processed and exposed to high-temperature treatment in evaporators and drying towers. In contrast, the whey protein in Piåtnica's cocktail is fresh and unprocessed thanks to the use of membrane processes.

By launching its cocktail, OSM Piåtnica has further improved its competitive edge. It has shaken up the whey protein category, which is dominated by powdered products. The powdered whey proteins have limited distribution outlets, mainly being sold in specialised shops. Furthermore, due to their powdered form, the products have negative consumer perception. For these reasons, whey protein was mainly used by bodybuilders and athletes. By introducing a ready-to-eat wholesome liquid snack that is available in the local grocery store, Piåtnica makes whey protein accessible to the average consumer.

The most common whey management model is to dry and sell it in the form of whey powder with very little margins. The revenue obtained from selling one gramme of whey protein in whey cocktails is considerably higher than that obtained from the sale of this protein in powdered whey. The profitability of the cocktail is also much higher. Assuming opportunity cost to be the cost of goods, the profitability of the cocktail takes on double-digit values. Another economic advantage is greater stability and predictability of profitability due to reduced dependence on shifts in commodity prices driven by global supply and demand.

This product was introduced onto the market in April 2020 and its great potential has been already observed. The whey protein cocktail was sold over the last nine months for 2 million PLN, despite challenges in distribution due to COVID-19 lockdowns. From early 2021, Piåtnica launched its cocktails at Poland's largest retailer. This will significantly increase the distribution of the product and consumer accessibility. Piåtnica expects that sales will increase at least fivefold, exceeding 2020 sales in the first quarter of 2021.

Background innovation - Intended purpose

Through implementing innovation, OSM Piåtnica increases the sustainability of its production processes. Being a big producer of cottage cheese, cream cheese and yoghurt, OSM Piåtnica obtains a large amount of whey, which is a by-product of their production. After drying, whey powder would go to mass market, bringing the cooperative a low margin, especially in light of the high price paid to its members for milk. Searching for alternative ways of whey sintering, Piåtnica isolated its most valuable ingredient - whey protein - and created consumer fresh cocktails in a bottle. The profitability of the cocktail is much higher than that of whey powder and helps to improve the profitability of the cooperative.

The innovative whey protein cocktail from Piątnica, which contains fresh and unprocessed whey protein, is the first and only product of its kind on the Polish market, and perhaps also on the European/world market. Whey protein has a particularly beneficial effect on human health due to its nutritional, regenerative, antioxidant and antibacterial properties. A serving of the shake contains only 227 kcal, very little fat and carbohydrates from natural fruit, purée or juice. It is available in three tasty flavours. One bottle of the whey protein cocktail contains 28 grammes of protein and 307 mg of calcium, which covers 56% and 38% of the nutrient reference values (NRV) for the average adult, respectively.

The cocktail is easy to consume and does not require additional preparation, in contrast to whey protein products available on the Polish market, which come in powder form and require appropriate preparation.

“Great idea to use all of the Cooperative’s available raw materials while bringing a competitive, innovative, healthy product to market.”

-S. Kurpiewski

The innovation

Constant developments in terms of the modern economy, globalisation and consumers’ expectations require the cooperative to search for new, innovative products. Trends related to healthy eating, activity and the fast pace of life shape consumer demand in Poland and Europe. The cocktail with whey protein from Piątnica fits in perfectly with these trends, simultaneously positively influencing the financial situation of the cooperative and its members.

Being one of the largest Polish producers of cottage cheese, cream cheese and yoghurt, Piątnica obtains a vast quantity of liquid whey. After drying, whey goes to mass market, where it is willingly bought by Polish and foreign feed producers. However, industrial products are not characterised by satisfactory profitability, especially taking into account the high price that the cooperative pays to its suppliers for milk.

In its cocktails, the District Dairy Cooperative in Piątnica uses valuable by-products to produce a healthy innovative cocktail with whey protein, which positively influences human health and quality of life. Whey protein is much more than a set of desirable amino acids and very good assimilability. According to numerous scientific studies, it is an ingredient that can have a particularly beneficial effect on our health. It not only nourishes and regenerates, but also promotes weight loss, supports immunity and has a beneficial effect on the health of the nervous and digestive systems, and plays an important role in tissue and organ building.

Whey protein makes up about 20% of proteins and about 0.8% of all milk components. It is a group that is particularly rich in essential amino acids, or those that the human body cannot produce on its own. These components must therefore be regularly supplied with food. They are responsible for stimulating protein synthesis in the body and affect the growth and maintenance of muscle mass. They have a high biological value, which means that in the digestive tract a large amount of protein can be absorbed at one time. The easy digestibility therefore defines whey protein and enables it to be used almost completely, i.e. all the essential amino acids can be assimilated.

So far on the market in the food group, whey protein has come in the following three forms: whey protein isolate (WPI), whey protein concentrate (WPC) and whey protein hydrolysate (WPH). However, they are all in powder form. Thus, they are highly processed products subjected to high temperatures on evaporators and drying towers, where a powder form is obtained which, when used, takes time to dissolve into liquid form. In contrast to the products

available on the market, whey protein used in Piątnica shakes is fresh and unprocessed due to the use of membrane processes and innovative processing technologies. In combination with natural fruit purées and functional additives (fibre, ginseng, oats) they create a tasty, wholesome snack.

The shake comes in three flavours: raspberry, pomegranate, ginseng; mango, passion fruit, oats; and banana, gooseberry, fibre. The final product is easy to digest and you will find in it 28 grammes of complete protein. Importantly, the shakes do not contain lactose or gluten so they can be consumed by people who are intolerant to these ingredients. Their natural and simple composition is another advantage.

OSM Piątnica improved its competitive position by introducing its cocktail. It created a new product category, clearly distinguishable from the existing offer of whey protein powders. Powdered whey protein was previously available in limited distribution channels, mainly in specialised stores. This product is available in large packs and requires preparation. Due to its powdered formulation, it does not have a good image among ordinary consumers. For this reason, whey protein is used by a niche clientèle - mainly bodybuilders and professional athletes. By introducing a whey protein shake to grocery stores, OSM Piątnica gives all consumers an opportunity to learn about benefits of whey protein consumption. The product is available in affordable individual packs.

Value Creation

As in other countries, interest in functional food is growing among Polish consumers. This is a result of a visible increasing awareness of the link between health and nutrition as well as lifestyle changes. Consumers are increasingly striving to maintain good health and full psychophysical fitness for as long as possible. They are interested in different product categories that not only satisfy their hunger and thirst and provide them with non-essential nutrients, but also those that are enriched with valuable ingredients that are associated with additional benefits - they help to maintain health, well-being and can contribute to reducing the risk of disease. With increasing consumer awareness, healthy lifestyle trends, which consist of a number of attitudes, habits and behaviours, are developing strongly. These are intended to protect or improve health and maintain fitness and self-esteem for years to come.

The global functional food market is dominated by dairy products, cereals, functional beverages and confectionery. The topic of functional beverages mainly focuses on people who participate in sports both professionally and at amateur level. There is a wide range of products dedicated to athletes, which can be used to increase the organism's efficiency, supplement components after exerting effort or improve condition during training.

In order to meet consumers' expectations, OSM Piątnica developed and proved that it can introduce to the market an innovative, tasty and healthy product - whey protein shake. It is a sheer novelty on the Polish market. It is a combination of the most valuable unprocessed whey protein and fruit. Whey protein is the best absorbent milk protein and thanks to the content of desired amino acids it nourishes the body and supports regeneration processes. The protein content of one bottle amounts to up to 28 grammes. The whey protein shake is a product with a simple composition, which does not contain lactose and gluten.

Whey shakes are a very cost-effective way to manage whey protein. The most frequently used model of whey protein management in practice is drying and selling it as whey powder, which is a highly processed product and obtains relatively low prices on the market. The revenue obtained from selling one gramme of whey protein in whey cocktails is considerably higher than that obtained from the sale of this protein in powdered whey. It is also worth noting that the profitability generated by the sale of whey shakes is much higher. Even assuming for the purpose of valuation of whey shakes that 1 gramme of whey protein costs as much as the alternative cost of selling it in whey powder, the profitability of such a calculated product reaches double-digit values. Another advantage, from an economic point of view, of using whey protein in whey shakes is the independence from global changes in the price of whey powder, which, due to fluctuations in global demand, is subject to frequent changes. The sale of whey protein in a ready-to-consume product allows the company to obtain consistent revenue from the sale of this protein (set at the upper limits of what can be achieved for whey powder) regardless of fluctuations in the global bulk product market.

This product was launched in March/April 2020 and already has huge potential. In the last nine months of 2020, the whey protein shake has sold for 2 million PLN, despite distribution difficulties caused by trade closures and reduced social mobility due to the COVID-19 outbreak. Nonetheless, the cooperative has

been able to significantly increase the distribution of the product. The cooperative is introducing cocktails for permanent sale to one of the largest chain stores in Poland. Piątnica estimates that sales will increase at least fivefold, exceeding 2020 sales in the first quarter of 2021.

SDGS:





San Lidano Soc. Cop. Agric.

Summary

The cooperative has created a certified short supply chain aimed at enhancing the historical skills and agroecological qualities in the reclamation of the Pontine Marshes (Agro Pontino) and at reducing the impacts on the environment and on the territory, in the highly innovative sector that the IV range, fresh fruit and vegetables, represents.

ISO 22005 certification is adopted through the creation of a Sustainable Supply Chain Disciplinary and through actions to reduce the impacts of manufacturing processes and packaging, and to enhance packaging with the commercial brand 'ORTI LAZIALI' for typical local products in the IV range outlet.

Background innovation - Intended purpose

SAN LIDANO has defined a new company policy, called "of Quality and Sustainability", which can be summarised in the following QUALITY AND SUSTAINABILITY HANDBOOK on which SAN LIDANO bases its following specific actions:

1. Provide consumers with healthy products, placing food safety at the centre of planning and management of processes and supply chain strategies, to meet market demands and give adequate responses and post-sale service to customers;
2. Reduce non-quality costs, preventing non-compliance and optimising the organisation of order management, through constant monitoring of products and processes, including those outsourced, and promoting modern techniques and best available technologies (BAT) to members to improve company plants and production, which focus on the rational use of resources;
3. Increase sales of products under the clients' brand name, in a spirit of partnership, to improve service efficiency, reduce complaints and offer products with competitive prices and/or greater added value, designed to enhance the value of the members' products;
4. Promote and protect the territory, representing the members' forms of production and interests, aiming to increase the value of their products and also by carrying out initiatives that strengthen the short supply chain and the cooperative's image of being close to production;
5. Implement environmental protection actions aimed at reducing the impacts resulting from its activities. These actions include: monitoring and optimising water resources; protecting surface water through the proper management of its discharges; avoiding risks of soil and groundwater contamination resulting from hazardous substances; optimising energy consumption through appropriate plant solutions and favouring alternative sources; monitoring the emissions of gases that are harmful to the atmosphere or that have a greenhouse effect; limiting and differentiating the waste produced by the activities; controlling and progressively reducing noise emissions and substances harmful to the environment; promoting methods of cultivation with low environmental impact (integrated production and biological pest control) designed to protect natural resources;
6. Reduce the risks to the health and safety of workers, both in the company and at the partners' and suppliers' premises, carrying out prevention, assistance and information activities;
7. Promote biodiversity within agri-ecosystems, through adequate and careful technical assistance to members, which encourages the application of cultivation and crop protection techniques that reduce chemical inputs, limit the risks of the residues of substances used, reduce non-renewable resources and safeguard the presence of wild species;
8. Carry out training activities by identifying needs and special programmes at all levels, both for staff and shareholders and suppliers, to promote responsibility

and sensitivity at all levels, in particular towards food safety and sustainability.

9. Involve stakeholders, implement communication strategies with citizens, customers, public and control bodies, employees, members, suppliers and other interested parties to ensure maximum transparency. Implement a system for the control and security of information and data and limit access, ensuring its implementation, maintenance and continuous improvement to give stakeholders confidence as to the adequacy of risk management.

10. Transmit the Company Policy to shareholders and suppliers, stipulating contractual agreements that commit them to observe the contents, comply with the requirements shared with customers, and implement its Code of Ethics, ensuring that its CSR principles are respected.

“Thanks to the ORTI LAZIALI supply chain project we have improved the profitability of production and obtained benefits for the environment and our territory”

Luciano Di Pastina - President and member producer of the San Lidano Cooperative

After defining the policy, consequent initiatives were launched, such as the new edition of its own corporate Code of Ethics, published in 2017, with the explicit aim of promoting these issues both among shareholders and in the organisation and to prove itself to customers as a partner able to give answers on this complex issue, which represents a real challenge for the future.

In the new Code of Ethics, SAN LÌDANO has stated the principles of Social Responsibility and its own values that form the basis of its daily actions and its corporate strategies, with a focus also on respect for legality and on measures to prevent and fight corruption and malfeasance.

The figures showing its commitment are published annually in a Sustainability Report, inspired by the principles of ISO 14001 and SA8000 standards, which also contains the actions identified by management for the continuous improvement of environmental performance.

Since 2018, SAN LÌDANO has been drawing up its own Sustainability Report that, thanks to the data collected in the first three-year evaluation period (end of 2020), will identify the performance indicators. These will be a point of reference for the next improvement actions, in line with the Sustainability objectives set by the European Commission as part of the Farm to Fork strategy and the future post-2020 Community Agricultural Policy.

The IV range now represents over 80% of sales. The remaining part (I range) is mainly represented by watermelons (12%) and some typical products of the Pontine area (e.g. courgette, squash flowers, agretti, scarole, lettuce, chicory, etc.). Sales are almost entirely bound for the

domestic market (exports, less than 3%, are represented almost exclusively by watermelons).

The historical motivation behind this project is rooted in the agricultural tradition of the Pontine Marshes (Agro Pontino). The Ager Pomptinus of the ancient Romans, which extends from the Lepini and Ausoni Mountains to the Tyrrhenian Sea and from the foot of the Albani Hills to the Gulf of Terracina, includes the coastal strip, the hinterland behind the Lepini Mountains and the area between them, which in the past was predominantly occupied by vast expanses of unhealthy marshes (the Pontine Marshes). The integral reclamation of the area, started by the Romans and resumed in 1930, returned almost 4 million hectares of fertile and cultivable land to agriculture and, in a short time, became, with the Agro Romano and the Conca Reatina, one of the most intensely cultivated areas of Latium and among the most representative for the national fruit and vegetable industry.

In the southern area of the Agro, where SAN LÌDANO operates, the production of fruit and vegetables in greenhouses and open fields is particularly

important, especially endives, spinach, chicory, chard and watermelons for which this territory is renowned in national and foreign markets. SAN LÌDANO has therefore decided to develop in the best possible way the characteristics that these products can offer through the brand ORTI LAZIALI. The brand is dedicated to adding value both in terms of the characteristics of the territory and the specialisation and know-how of the processing of these local productions. In the Agro Pontino, the fruit and vegetable sector is number one in order of importance both in terms of area and quantity, with some important crops and specialisations in which the Pontine and Fondana areas are still leaders at regional and national level. Just think of the PGI Kiwi Latina, the white celery of Sperlonga, the artichokes of Sezze and other historical products from the area: plums, tomatoes, courgettes, melons and watermelons. The Fondi Centro Agroalimentare, which has been operating since 1930, became in the post-war period, with over 11 million quintals of fruit and vegetables, one of the most active markets in the exportation by rail to the markets of Northern Europe.

Value Creation

Constant growth of turnover in the three-year period 2017-2019, increase in number and loyalty of customers, inclusion of products typical of the Pontine territory (eg. puntarelle, agretti, chicory, kale) in the IV range references on a national scale. The idea to extend the project to other Italian vegetable companies stemmed from this experience and in 2016 the 'ITALIAN CHAIN' dedicated to the brands of customers who require the guarantee of national product was created. Since 2017, the project and the companies 'ORTI LAZIALI' and 'FILIERA ITALIANA' have been included in the same ISO 22005:05 certification, thus maintaining their specificity of origin.

The value created and the results obtained with this innovation translate in particular through the markets. In recent years, the strategy undertaken to strengthen the large-scale retail trade channel by privileging the supply of customers' own brands has been rewarded with growth in business volume, albeit in a difficult economic period. This is also thanks to the high service content that SAN LÌDANO is able to offer its customers.

The idea of enhancing the traditional experience of the Pontine area in the processing of vegetables comes from the cooperative of SAN LÌDANO's producer members, who represent all the phases of the production process, from the field to the packaged product, in a single organisation. With these prerogatives, the ORTI LAZIALI project represents an array of fruit and vegetables of I and IV range that combines the tradition and quality of horticulture found in the Pontine Marshes in a "short chain" and merges the three pillars of sustainability: economic, social and environmental.

ORTI LAZIALI is an initiative that SAN LÌDANO has decided to propose to its most prestigious customers who are interested in products obtained with a certified control and guarantee system and demonstrable sustainability contents.

The general results and what has been achieved with the innovation introduced with respect to the intended purpose. Since 2017, in line with the company's Code of Ethics, SAN LÌDANO has already reached some important sustainability goals. Since 2018, SAN LÌDANO has been supporting social responsibility audits in agriculture according to the G.R.A.S.P. module with the certification body CSQA, as part of the Cooperative's GlobalG.A.P. certification (Option 2). Since 2018, the cooperative has been enrolled in the INPS Quality Agricultural Work Network (Italy) and has promoted the membership of member companies.

REDUCTION OF WATER CONSUMPTION:

Increase (25% of the cultivated area) in micro-irrigation systems (hose or nebulisers -in the greenhouse-), which reduce water consumption by 60-70%. Project to optimise water consumption in IV range processing (in collaboration with the company Culligan, leader in global solutions for water treatment).

REDUCTION IN ENERGY CONSUMPTION AND EMISSIONS:

S-COOP project to monitor and optimise energy consumption, in collaboration with LEGACOOOP and ENEA. Installation of photovoltaic panels at the Sezze plant.

RATIONAL USE OF DISCARDS AND SURPLUSES:

Collection of surpluses in agreement with CARITAS of Lazio. Disposal of scraps as fodder for zootechnical use (buffalo farm nearby, in Sezze Scalo).

RESPECT FOR BIODIVERSITY:

SAN LÌDANO has joined (in collaboration with the Consorzio di Bonifica dell'Agro Pontino) the “Nucleo Fasce Frangivento” to protect and safeguard the territory as a fundamental element in terms of environmental balance. This is a programme to enhance and restore shrub and tree vegetation (eucalyptus, acacia, pine and cypress trees) along the drainage canals, roads and farm boundaries. The initiative involves the Agro (Sisto river, Mussolini canal, Rio Martino Acque Medie and the minor canals within their basin), and the network of roads with a width varying between three and six metres.

REDUCTION IN CONTAMINATION:

SAN LÌDANO promotes practices that use phytosanitary products in a way that reduces the risks deriving from the use of agropharmaceutical products or fertilisers and provides indications to reduce their impact in agricultural areas. The activity is carried out in compliance with the National Action Plan for the implementation of EC Directive 128/2009, which established the action framework for the sustainable use of pesticides. Members and suppliers in the SAN LÌDANO chain apply the regional Integrated Production Regulations and the requirements of Good Agricultural Practices as provided for in the international standards GlobalG.A.P. and QS. Certified organic production has been initiated.

Verifiable indicators (or other factual information) of results indicated.

148 farmers involved

Increase in turnover (from €35,318,461 in 2017 to €42,149,168 in 2019)

10 private brands distributed in Italy and abroad.

SDGS:





ECONOMIC VALUE CREATION

SUPPORT TO FARMER-MEMBERS

ECONOMIC VALUE CREATION

SUPPORT TO FARMER-MEMBERS



AGROCAT, Agropecuària Catalana S.C.C.L.

Summary

AGROPECUARIA CATALANA SCCL is a top-tier cooperative that brings together family livestock enterprises in the central regions of Catalonia in the northeast of Spain. The pig sector in Spain is currently undergoing major consolidation. This has led to the emergence of large companies that occupy much of the value chain, generating economies of scale and absorbing or integrating traditional family farms. The family livestock model is experiencing a continuous erosion of competitiveness due to large business models that are able to verticalise production, apply economies of scale, invest in large infrastructure, occupy large parts of the food production and supply chain and access large international markets.

In 2015, the cooperative mapped out its strategic plan, which identified key areas for improving the competitiveness of the members and a series of necessary investments. A major part of the efforts focused on applied innovation in different areas with

the common objective of improving the sustainability of an economic and social model compromised by the dynamics of the market, with a special focus on environmental sustainability, which is critical to the survival of our model.

These cross-cutting and widely-applied innovation actions, together with other investments and the efforts of our team and members have resulted in gains in competitiveness and sustainability, as well as significant increases in turnover and market share.

All of the innovation projects implemented in this period have a twofold aim:

- To create value that passes on to our members and benefits them
- To improve the environmental sustainability of our operations

The six projects are as follows:

1. Development of a continuous manufacturing NIR system to analyse all raw materials before unloading
 - Over 400,000 non-polluting, non-destructive analyses per year
 - Allows nutrients that surpass the average to be used
 - The ultimate objective is to formulate feed daily with real analytical values for products in the factory, which will generate significant savings in formulation and in the use of resources.
2. Development of an online platform to analyse all feed production
 - Over 1.5 million non-polluting, non-destructive analyses per year
 - This generates value through significant savings in terms of formulation and the amount of products that are rejected and reprocessed
3. Development of a testing unit equipped with feed weighing stations and equipped to weigh individual animals
 - This generates value by tailoring feed to different genetics and production situations
4. Development of an App for waste management, field fertilisation and traceability

- We manage more than 2.2 million kg of nitrogen with our smartphones
- 5. Promoting a crop programme for cover vegetation between crops
 - Changing the tradition of leaving the fields bare in summer
 - Prevents erosion, improves fertilisation and nutrient balance
- 6. Development of a mini biogas plant adapted to our farms
 - Generates value by making use of energy
 - Reduces emissions and energy consumption and improves the fertilising quality of the final digestate

Implementing all these innovation projects has increased our competitiveness on two fronts:

- AGROCAT has become the preferred partner for family livestock companies in our area of influence, which has increased our leading position, market share, turnover and results.
- The farms of our members have recovered their competitiveness with regard to other models.

Thanks to its innovative mindset, AGROCAT has returned more than 3.3 million euros directly to its members in the last five years.

“From our leading position, we promote the economic and environmental sustainability of family livestock companies. We demonstrate that environmental sustainability is economically feasible in the short term and provides value in the long term. We show that the cooperative system generates value in our region”.

Background Innovation - Intended purpose

The pig sector in Spain is immersed in a strong process of concentration. This has led to the emergence of large companies that occupy much of the value chain, generating economies of scale and absorbing or integrating the traditional family farms. In 2015, the cooperative defined its strategic programme in which we identified some of the points where we should improve the competitiveness of our partners and applied a series of investments to do this. A major part of the efforts focused on applied innovation, initiating actions in different areas with the common goal of improving the sustainability of an economic and social model that we see is compromised by the dynamics of the market, with a special focus on environmental sustainability, which is critical to the survival of our model.

This cross-cutting and widely-applied innovation, together with other investment actions and the work of our team and partners has resulted in improvements in competitiveness and sustainability and a significant increase in turnover and market share.

The Innovation

Our cooperative's mission is “to contribute to the viability of the family livestock business in Catalonia through the added value of our products and services”. The family livestock model is suffering from a continuous erosion of competitiveness in the face of large business models that can verticalise production, apply economies of scale, invest in large infrastructures, occupy a large part of the food chain and access large international markets. Concerned about our farms' loss of competitiveness and in light of our mission, vision and values, in 2015 we developed a five-year strategic plan, identified several areas for improvement and began a list of actions that would allow us to move in following directions.

One of the conclusions of this strategic plan was that applied innovation was one of the tools that had the greatest potential to achieve our objectives.

- to apply it immediately in our operations or those of our partners;
- to have return on investment of less than seven years or relevant intangibles;
- to significantly improve cash flow, or provide relevant environmental value;

- to make it feasible for our partners in terms of financial and operational aspects.

In this period, the cooperative has launched six innovative projects with identified objectives for each of them.

1. Analysis of all raw materials before discharge with a continuous NIR flow.

This analysis allows the cooperative to nutritionally classify all raw materials before unloading and assigning them to specific destinations in the factory. Thus, two types of wheat of different origins with significantly different nutrient contents can be processed as different materials.

This development allows us to classify several qualities of each raw material and to formulate feeds with more adjusted nutritional values.

The final objective of the project is to formulate our feeds daily with the real nutritional values of the raw material that we have in the factory.

This entails significant savings in the use of protein materials and being able to reduce the safety margins when formulating, with the consequent economic and environmental impact.

2. Development of an online NIR in the final product

This project, awarded with a PITA prize in 2013, continues to be a pioneer throughout Europe. It allows the cooperative to monitor in real time the protein, fat and humidity of our feeds and to correct our formulae on the spot, obtaining feeds that are completely adjusted to the theoretical formulation. The programme allows the cooperative to reduce the safety margins when formulating with the consequent economic and environmental savings. It also allows the cooperative to detect errors or quality problems early, so that we reduce incidents, returns and product reprocessing.

3. El Tatjé testing unit

The cooperative has designed a fattening unit equipped with material capable of testing the isolated intake of each pig and at the same time of weighing the animals individually. The cooperative can also obtain manure production data from each nutritional programme. This provides the enterprise with reliable and comparative information on the different nutritional programmes. The amount of equipment on the farm will be increased to enhance the statistical value of the tests and to accelerate our developments.

4. Applipur

The cooperative has developed an App to manage and trace the management of our partners' slurry. (Best Agricultural App, 2017

RuralApps Award).

Applipur makes it possible to integrate all movements of slurry into a single system, cutting down on time spent managing documentation and ensuring traceability. Users highlight its operational simplicity, low cost and versatility. The use of this innovation improves the fertilisation of fields, prevents errors that could damage the environment and reduces the time needed for management.

5. Green Coverage Programme

With this initiative, the cooperative intends to promote a summer crop programme in the area. This breaks with a tradition of leaving the fields bare at this time.

“After the success achieved, the cooperative has consolidated its position as a reference point for achievement, providing both social and economic value.”

The objectives of this ambitious programme are:

- to have a cover in the fields during the summer to avoid erosion and loss of arable land;
- to test various extractive crops to improve the soil's nutrient balance;
- to improve the percentage of organic matter in our soils;
- to obtain a summer crop that can be used in our feed mills and provide income to our farmers.

6. Mini biogas plant.

7. The cooperative has developed a prototype mini biogas plant with a threefold objective:

- A. 1.- To reduce emissions;
- B. 2.- To use renewable energy;
- C. 3.- To convert slurry into digestate to optimise the use of fertiliser.

And with certain characteristics:

- Affordable cost to allow our farms to produce energy at a competitive cost and for it to be used on the farm itself.
- Improve the quality of the manure as a fertiliser by converting it into digestate, by fixing the ammonia in more stable and bioavailable forms and reducing the greenhouse gases.

In 2020, the mini biogas plant prototype started working on our farm "els Campassos". Due to the mild climate in our area, the results of gas production are exceeding expectations. The cooperative is very confident that this development will contribute to optimum efficiency of our farms from both an economic and environmental point of view.

Due to the low-cost approach to construction and energy use on the same farm, the return on investment will be rapid, which will help the expansion of the project.

The environmental improvements that result from this type of facility are clearly reflected in the reduction of fuel use and the prevention of ammonia emissions into the environment. The final product is a digestate in which all forms of ammonia are fixed and which therefore has a higher value as a fertiliser. These six areas of innovation are complemented by other actions aimed at improving key aspects of production with an impact on feed/meat processing rates and therefore on the environmental and economic sustainability of our farms.

In these five years, the cooperative has invested more than 3.5 million euros in applied innovation.

The balance is highly positive in the three pillars according to which we evaluate the investment:

Economic sustainability -> The cooperative has improved the competitiveness of its products and services, through significant cost savings and increasing its sales volume and operating margins.

Social sustainability -> The economic improvements have allowed the cooperative to apply more competitive prices to our products, transferring value to its member associates and returning part of its cooperative surplus.

Environmental sustainability -> The six projects that we have developed have an environmental component. The first three are due to the savings made by optimising resources in the formulation of our compound foods. The three remaining projects have a direct impact on the environment.

The cooperative is using its leading position to promote the concept of environmental sustainability among its members and to overcome the preconceived idea that environmental sustainability generates an unbearable short-term economic cost.

"We are demonstrating that we can significantly enhance the sustainability of our traditional model without losing competitiveness. We want AGROCAT to be an example of a competitive company that is committed to environmental sustainability and the partner of reference for all family livestock companies in Catalonia."

Value Creation

Each of the innovation areas has obtained specific results with regard to economic and environmental aspects.

1. Continual analysis of raw materials using NIR equipment.

- Multiply by 10 the analyses carried out without increasing the cost.
- None of the analyses are contaminating, as no reagents or disposable products are used, or destructive as we do not need to isolate any samples.
- This knowledge allows us to make the most of all the excess quality compared to the standard reference. This means using fewer resources which has economic and environmental benefits.
- We estimate the savings made by the system to be 0.5 euros/tonne. A significant amount if we take into account the manufacturing volume.
- It also allows us to classify the local product according to its nutritional quality, rewarding the best producers and stimulating agricultural practices that result in quality.

2. Feed analysis in NIR Online.

- We analyse all our production. Detecting manufacturing problems immediately and being able to correct them reduced the number of substandard products by more than 50% in 2020.
- The decrease in substandard products cuts down the energy used in processing and transport and also prevents food resources from being wasted. The average cost of reprocessing is 25 euros/tonne.
- 1% reduction in the safety margin applied to the formulation. We estimate the savings achieved to amount to around 0.25 euros/tonne.
 - The immediate correction made with the NIR Online to feed has meant an additional reduction of 305 tonnes of soybean flour, 47%, in 2020.
 - We carry out more than 1,500,000 analyses/year that are non-contaminating as no reagents or disposable products are used, and non-destructive as the analysis is done on the production flow and it is not necessary to isolate any sample.

3. El Tatjé testing unit

- 10 tests carried out with different nutritional, genetic, additive and raw material programmes with the aim of optimising the efficiency of our compound feeds.
- In all the tests carried out, water consumption, manure production and dry matter content, N and P, have been controlled and analysed.
- To understand the power of this unit, we can say that an adjustment of 0.10% in the protein of the feed can mean a saving of 800 tonnes of soybean flour per year to obtain the same results. We are convinced that the knowledge generated by this unit marks an accelerated development of our products from an economic and environmental point of view.

4. Applipur

- More than 210 farms are using Applipur for livestock waste management and nitrogen fertilisers.
- We estimate that some 630,000 m³ of slurry and 2,205,000 kg of nitrogen are managed annually by Applipur.

5. Green Coverage Programme

- Field tests carried out with different crops (mustard, fodder turnip and sorghum).
- First preliminary results published. (3TRES3, NutriNews, etc.)
- Expansion of the Green Coverage Programme to more than 20 agricultural companies in the region.

6. Mini Biogas Plant.

- Plant operating since September 2020
- Estimated gas production of 40,000 m³ per year, which directly reduces the use of fossil fuels.
- Improvement of slurry properties as digestate: odour, pathogens, N-NH₄⁺, homogenisation.

Creation of joint value

The application of all these lines of innovation has resulted in a twofold increase in competitiveness.

- AGROCAT has become the preferred partner of family livestock companies in our area of influence, increasing its leadership position, market share, turnover and results.
- The farms of our associates are recovering their competitiveness with respect to other models.

Relevant data for the 2015-2020 period:

	2015	2020	Increase
Feed Tn.	199413	270086	+73%
Sales Thousands of Euros	93142	144.435	+64%
Ebida Thousands of Euros	2115	4171	+97%
Net Results 000€	1059	2071*	+95%
Social Cash Flow 000€	6419	9210	+43%
Members > 200,000€	48	60	+25%
Direct return 000€	563	877*	+56%

It should be noted that this improvement has been made in a very mature sector faced with a strong presence of competing companies.

As a result of this improvement in results, AGROCAT has directly returned to its members more than 3.3 million euros in the last five years.

- From our leading position, we promote the economic and environmental sustainability of family livestock companies.
- We demonstrate that environmental sustainability is economically feasible in the short term and provides value in the long term.
- We demonstrate that the cooperative system generates value in the territory.

SDGs:





Dairygold Co-Operative Society Limited

Summary

The Sustainability Bonus was introduced in 2019 to help our milk suppliers to improve their sustainability and strengthen Dairygold's milk production base. The primary focus of the scheme was on improving herd health and increasing herd productivity through two programmes- a milk recording programme and a herd health programme. The secondary focus of the Bonus Scheme was to reduce our milk suppliers usage of antibiotics both to help them avoid the risk of antimicrobial resistance from affecting them, their families or their herds as well as helping them to prepare for changing legislative requirements in the near future. This bonus is aligned to the EU Farm to Fork Strategy on AMR with the objective to reduce antibiotic use in the EU by 2030.

The Sustainability Bonus offered extremely attractive financial incentives for milk supplier to participate in either a Milk Recording Programme or a Herd Health Programme or both. The financial incentive was based on the volume of milk supplied, ensuring fairness and transparency. Personnel with specialist technical knowledge were employed to support both programmes. Also, other Co-Op Knowledge Transfer programmes, including the Dairygold/Teagasc Joint Programme complimented and actively supported the Sustainability Bonus Scheme. Suppliers were informed of the benefits of participating in these programmes and advised on how best to utilize the information generated within the milk recording and herd health programmes.

Dairy farmers who milk record their cows and utilise the information benefit in many ways. This information allows farmers to easily identify which cows are infected with mastitis and thus aid quick and effective treatment, ultimately reducing levels of Somatic Cell Count in the herd. Reduced mastitis infection rates lead to savings from reduce veterinary costs, medical treatment costs and cull costs, as well as increased milk yield and quality. Yield data and infection rate data can be used to accurately identify which cows to cull and which to breed from to achieve better yields. Better breeding decisions lead to quicker genetic progress and increased herd EBI (Economic Breeding Index). This leads to more efficient cows with better feed conversion rates, which produce more milk at lower feeding levels. This improvement in efficiency level can be directly related to a reduction in carbon emissions.

Since efforts to increase the take up of the Sustainability Bonus were massively hampered by COVID-19 throughout the year 2020, the majority of participants who have taken up the Sustainability Bonus did so in 2019. Since its introduction in 2019, there has been a 30% increase in the number of milk suppliers who now milk record and there has been a 115% increase in the number of Dairygold farmers participating in a Herd Health programme. These farmers have helped to achieve an increase in average herd EBI by 15.7%, an increase in milk solids by 2.8%, a reduction in the replacement rate of Dairygold dairy herds by 6.8%, a reduction in somatic cell count (SCC) level at farm level by an average of 8.8% and an overall reduction of carbon emissions used per litre of milk produced by 5.5%. The current average Dairygold carbon footprint figure for its milk suppliers is 1.1KG CO₂e/kg FPCM.

In parallel with these improved statistics, work to support the move to selective dry cow therapy i.e. the treatment only of cows with mastitis infection present at drying off, is ongoing. All Dairygold dairy farmers are being encouraged through all Dairygold advisory programmes, not only through the Sustainability Bonus programmes, to embrace selective dry cow therapy as soon as possible so that they will be able to seamlessly manage mastitis in their herd in 2022 and onwards when legislation will require this as a minimum.

The Sustainability Bonus has provided Dairygold's supplier base with a clear competitive advantage over their counterparts, given the multiple and continuous benefits to both joining the Sustainability Bonus programmes and utilising the data gained year on year thereafter. While the financial benefits and carbon emissions reductions can be measured, the risk of AMR is more difficult to measure but extremely important to address. This Sustainability Bonus programme both compliments and is complimented by other Dairygold programmes which will ensure that it is robust into the future. Both Dairygold milk suppliers and Dairygold Co-Op as a whole have and will continue to reap the benefit of this unique project well into the future and likely for generations to come!

Background innovation - Intended purpose

Dairygold is Ireland's largest Co-Operative processing over 1.4 billion litres of milk annually and supporting thousands of farmers for more than 150 years. Located in the rich fertile Golden Valleys of Munster, Dairygold has a long and proud history of producing quality-assured, sustainable gold standard cheese and dairy ingredients.

Sustainability is a key factor in the purchasing decisions of the global food companies that Dairygold supply and demonstrating sustainable farming practices is critical to Dairygold's future success.

In 2013, the Board introduced the Sustainable Dairy Assurance Scheme (SDAS)- a national project designed to guarantee the highest quality milk production standards and encourage suppliers to farm more sustainably. Dairygold now has full participation on that scheme.

In 2019, the Board approved a new Sustainability Bonus unique to Dairygold producers who participate in a dedicated Milk Recording and Herd Health programme.

Dairygold view this as a longer-term initiative to improve overall Herd Health and performance across Dairygold's milk supply, as well as improving the financial and environmental sustainability of its primary producers. This Sustainability Bonus is aimed to reduce the losses associated with poor animal health, thereby maximising milk solids per cow and ultimately leading to a more sustainable milk production base.

The innovation

a) Innovation and context:

Having achieved 100% certification in the Bord Bia Sustainable Dairy Assurance Scheme and focusing on the Dairygold's future, the Board of Dairygold were very conscious of the requirement to target the development of its members' family farms through two areas, namely Antimicrobial Resistance and Sustainability.

In 2019, the Board approved a new Milk Supplier Sustainability Bonus which encourages more sustainable milk production. This new Bonus Programme would be run in conjunction with our business partners Munster AI, who had the expertise and infrastructure to manage and develop this programme to the highest standard. Through this partnership, we could be assured that implementation would take place quickly and effectively, ensuring that the knock-on benefits would be realised as soon as possible.

b) The Innovative method

The Sustainability Bonus Scheme consisted of two separate but complimentary programmes:

1. Milk Recording Programme

Under this programme, milk suppliers were rewarded with a bonus payment of 0.1 cent per litre for milk supplied if milk recording their herd. This is a substantial payment and in many herds, meant that at least half of the cost of milk recording would be subsidised, making this programme a very attractive offering. They were given the option of either having a technician take the milk samples for them or carrying out sampling themselves. A minimum level of four milk recordings was required to qualify for this programme.

While a milk recording service was available to Dairygold suppliers prior to the introduction of the Sustainability Bonus Scheme, despite the multiple proven benefits that it offered, applicant numbers were slow to increase. (In 2018 43% of Dairygold's primary suppliers were milk recording). Under the Sustainability Bonus Programme, not only was a financial incentive provided, but flexibility was built into the programme allowing for the supplier to choose how and when to do the sampling. At the same time, there was substantial investment made into this programme from the beginning to ensure that excellent technical support and advice would be provided to those considering milk recording for the first time and extensive marketing was carried out to better communicate the multiple benefits to milk recording.

2. Herd Health Programmes

This programme incentivised milk suppliers to participate in one of a range of disease testing and control programmes. The value of the incentive was paid at

0.05 cent per litre supplied regardless of which herd health programme a supplier opted to participate in. This incentive level meant that many participants availing of the most basic programme, were almost entirely reimbursed and the cost of the more expensive programmes were substantially supported by this Sustainability Bonus. A 'Gold, Silver and Bronze' programme was offered to suppliers whereby the level of testing, type and level of support and cost varied. This allowed suppliers to choose a programme that matched their disease control needs, their knowledge level as well as their budget. The diseases tested for under this programme included BVD, IBR, Johne's, Leptospirosis, and Liver Fluke. This was carried out in a labour-free process whereby four bulk milk samples are taken and tested automatically at different times during the year.

In 2019, Dairygold were conscious that new veterinary medicine regulations were to be implemented in January 2022 whereby herd owners will no longer be permitted to use antibiotics for prevention of disease. This means that the current prevalent practice of blanket treating all cows at drying off will not be allowed after January 2022. While this is a welcomed change given the risk of AMR to our suppliers and their herds, it also represents a large change in herd management and diseases control practices. This required change in management practice has the potential to seriously frustrate farmers and potentially

might lead to significant disease outbreaks on farms, particularly when first introduced. Both the Milk Recording Programme and Herd Health Programmes under the Sustainability Bonus are designed to help our farmers to prepare for this change and prevent disease outbreaks from occurring.

c) Improvements in Competitive Position

Prior to the introduction of this Sustainability Bonus Programme, a study was carried out comparing Dairygold suppliers who were milk recording with those who were not. It was found that milk recording herds produced, on average, 50Kg more solids per cow per year. This is potentially worth an additional €23,650 per annum for a 100-cow herd. This supports the work that Dairygold has carried out with Animal Health Ireland within the national Cell Check Programme.

The numerous benefits and competitive advantage gained by Dairygold Milk Suppliers by participating in the Sustainability Bonus Programme:

- Distinguishing between best and worst cows on a production basis allowing for the easy identification of superior cows to breed replacements from, thereby maximising genetic gain and quickly increasing herd EBI.

- Tracking the SCC of each cow, allowing for better management which in turn results in improved milk revenue. Low SCC cows produce more milk and less culling is required, leading to a more mature herd. All combined, this results in greater peace of mind for milk suppliers. Example: Reducing

SCC from 200,000 to 120,000 increases profit per cow by €85, resulting in an increase of €8,500 for 100 cows. More milk is produced from low SCC cows, less culling, more mature herd and peace of mind.

- Realising improvements in milk fat and protein percentages as a result of better herd management decisions made through using milk recording reports which ultimately translates into increased gross margin. Maximising the kgs and € value of milk solids sold. Example: The average supplier is delivering 390 kg whereas the top 10% are delivering 480 kgs/cow. At €4/kg the difference is €360 a cow and €36,000 in a 100-cow herd. Increasing the % of fat and protein % in the milk greatly increases milk price, increasing from 4.00 to 4.20 % fat and 3.50 to 3.65% protein will add 1.7c/litre. This is worth €10,200 in a 100-cow herd.

"I place huge importance on Dairygold's Milk Recording and Herd Health Programme. It was like picking lottery numbers in the past."

Isabell McGill, Grenagh, Co. Cork

- Milk recording allows you to identify cows for selective dry cow therapy and still achieve low SCC. This greatly simplifies the milking routine in spring leaving you to focus on other tasks.

- Milk Recording herds can command a premium for in-calf heifers and dairy heifer calves due to the availability of the production figures of the dam and her EBI.

In the unfortunate event that your herd or part of your herd must be culled as a result of a TB outbreak, on the provision of milk recording records, a higher premium can be availed of.

- Recommendations on a targeted vaccination programme – herd owners are given expert advice about what to vaccinate for as part of our Herd Health Programmes.

- Reduction in antibiotic usage – The best way to minimise antibiotic usage is to minimise the need for treatment in the first instance. Appropriate vaccination and control of parasites are critical to achieving this.

- As part of the Herd Health programme, at the end of year consultation providing a full review of milk suppliers herd performance is carried out. The Herd Health team compiles all the available data from the herd including production, EBI/genetics, SCC/mastitis, fertility, nutrition, Johne's and disease/parasites.

Value Creation

Since its inception in 2018, almost 13% of Dairygold milk suppliers have taken up milk recording (a 30% increase on those previously milk recording) and 28% of our primary producers have participated in a Herd Health programme for the first time (equivalent to 790 new farmer participants in this programme). It should be noted that the majority of the uptake to these programmes occurred in 2019 as marketing and set-up efforts were significantly hampered by COVID-19 throughout 2020.

With the introduction of the Sustainability Bonus, the average Dairygold Herd EBI improved by 15.7%. Improved breeding management was directly responsible for this increase and this would have been aided significantly where farmers were milk recording and used the information this provided. Better breeding decisions also led to an increase in milk solids (fat and protein) produced by cows in the Dairygold supply chain (2.8% increase in milk solids occurred since 2018). Similarly, farmers who utilise their herd health and milk recording data, can better identify poorly producing cows and high disease-risk cows allowing them to cull cows more effectively. Since 2018, Dairygold Farmers have been able to reduce their cow replacement rate by 6.8% and this would have been positively affected by the herds participating in Dairygold's Sustainability Bonus scheme.

Intended purpose:

- Increase the number of herds Milk Recording
- Encourage suppliers to participate in a Herd Health programme
- Improve the Sustainability of the Dairygold milk production base.
- Help farmers to combat AMR (Antimicrobial Resistance)
- Improve average herd EBI
- Reduce CO2 emissions
- Increase milk solids & milk quality

Many Irish agri-based studies have shown that by decreasing SCC in dairy cows, there are substantial production and associated financial benefits. The primary intended purpose of Milk Recording is to directly and immediately improve mastitis levels within a dairy herd. Since the introduction of the Sustainability Bonus, the Dairygold average herd SCC level has reduced by 8.8%. This improvement has a knock-on effect on production efficiency and a

corresponding positive effect on carbon emissions on a per product basis i.e. producing more by using the same amount or less. The carbon emissions on a 'per litre produced basis' at Dairygold have decreased by 5.5% since 2018. While actions made through the Sustainability Bonus are not the sole reason for this improved carbon figure, it would have contributed significantly to this positive outcome.

The increased prevalence of Antimicrobial Resistance poses a large risk both directly to the health of our milk producers as well as to the entire Co-Operative. This risk was a significant factor leading to the introduction of the Sustainability Bonus. The Animal Health programme is based both on vaccination and preventative measures as well as routine testing to quickly identify and treat disease. All animal health programmes include support by specialist advisors both online, over the phone and during annual face-to-face sessions. Suppliers participating in the Milk Recording programme can identify cows suitable to successfully be dried off without the aid of blanket antibiotic usage. Both programmes under the Sustainability Bonus aim to help to reduce the need for and usage of antibiotics. While it is very difficult to accurately measure how many farmers have embraced selective dry cow therapy, a survey carried out at the start of 2020 showed that 27% of suppliers said that they have tried to carry out selective dry cow therapy on some or all their herd during 2019.

Results – the Sustainability Bonus Programme has helped to:

1. Increase Milk Recording herds (+30%), Herd Health Herds (+115%)
2. Increase EBI (+15.7%), which will lead to increased milk solids (fat & protein) (+2.8%)
3. Reduce the replacement rate (-6.8%)
4. Improve milk quality (+2.4%) (SCC reduction -8.8%)
5. Contribute to improvement in Carbon Number (- 5.5%)

All key performance indicators show that the Sustainability Bonus programme has had a beneficial effect on many financial and sustainability factors in the Dairygold supply chain. However, it is expected that these benefits will increase dramatically as more herds join the programmes and learn to utilise the information that they provide better. This Bonus Programme will be an essential tool to aid primary suppliers over the next few years when reduced usage of antibiotics will become a significant herd management challenge.

The knock-on effects of utilising information provided when Milk Recording and implementing a Herd Health Programme:

- Increase in total solids (fat & protein) by 2.8% since 2018 has resulted in increased yield in both our Cheddar & casein manufacture. This has led to a longer production season with improved shelf and premium products for the marketplace.
- Improved health - reduces deaths and diseases, direct financial benefits and indirect benefits to labour and time inputs.
- A €20 EBI increase can lead to a 3% carbon footprint reduction

SDGS:





Glanbia



Summary

The Twenty20 Beef Club is an innovative beef production model that is integrated right across the supply chain and has at its heart the long-term economic and environmental sustainability of our Farmer Members. It combines:

- A guaranteed market with predictable pricing;
- Financial certainty underpinned by premium pricing;
- A comprehensive technical support programme;
- An “Advance Payment” option to alleviate cash flow pressure and regularise income;
- A production model that reduces the carbon footprint of the beef produced;
- An unrivalled consumer proposition that addresses trends, concerns and taste.

This innovation is also unique in that it involves the collaboration of partners, including Kepak Group and Finance Ireland, that bring skill sets and market access that are not within our own Co-operative structure and uses those to create value for our Farmer Members.

Our beef producing members operate with very tight margins and depend substantially on support payments. The value of the premiums/bonuses available to Club members is a game changer in terms of farm income.

The Twenty20 Club delivers right across multiple criteria and brings unrivalled traceability and provenance to the beef supply chain. It provides all the elements of a leading edge Blockchain development. It has all the required components from genetics on the source farm right through the animal's life cycle with all inputs supplied by Glanbia Ireland and all aspects of production, health, welfare and nutrition managed through strict protocols and strong technical support.

What stand out the most are the economic benefits to our beef-producing members as demonstrated by the example earlier. In this example, the member benefited by €108/head. Whilst further work is in progress on the carbon footprint reduction, the indications from researchers in this area are that it will be in the order of 20%.

At the outset we stated: The innovative Twenty20 Beef Club was developed to improve the economic, social and environmental sustainability of dairy calf-to-beef production. Delivering better economic returns for our Co-op Members and the farming community a central purpose. We believe it has clearly delivered on its core objectives and will be a major force in shaping future trends and standards within the Irish beef production business.

“Farming together for a sustainable future”

Background innovation - Intended purpose

The innovative Twenty20 Beef Club was developed with the core purpose of improving the economic, social and environmental sustainability of dairy calf-to-beef production to achieve stronger financial returns and a more sustainable system for our Co-op Members and the farming community.

The programme markets the output at a price premium and delivers a guaranteed route-to-market for beef from our grass-based dairy herds and sustainable production model. It was established against a backdrop where milk quotas were removed across the EU. This resulted in many farmers across Europe fully utilising their milking platforms, with dairy cow numbers increasing to over 1.5 million in Ireland.

Glanbia Co-operative Society Ltd promotes sustainable practices in milk production and all aspects of animal welfare to support our positive reputation with customers and our social licence to farm. Securing long-term markets and predictable pricing will provide a purposeful life for beef cattle of the dairy herd and deliver sustainable economic returns for calf producers, beef rearers and finishers.

As a result, the visionary approach resulted in the Twenty20 Beef Club being established. We partnered up with Kepak Group (beef processor) to ensure the product was brought to the target premium markets, and with Finance Ireland to support an Advance Payment option where cash flow is a challenge.

The innovation

The Twenty20 Beef Club is a fully integrated Calf-to-Beef programme. A fully traceable input supply chain underpins the programme, delivering a closed loop which is appealing for major retail and food service customers, and supporting the establishment of industry leading standards.

In the initial pilot year, it was oversubscribed and it is on track to reach the target of 20,000 additional calves this year. In the next phase, the Club is aiming to bring in 50,000 additional calves in its third year.

One of the key points that has strongly interested and directly benefited farmers is the additional value created by sustainably producing beef, with complete traceability and transparency.

The core objectives are:

- A guaranteed market with predictable pricing
- Financial certainty underpinned by premium pricing
- A comprehensive technical support programme
- An "Advance Payment" option to alleviate cash flow pressure and regularise income
- A production model that reduces the carbon footprint of the beef produced
- An unrivalled consumer proposition that addresses trends, concerns and taste

The Vision for Club members:

- Provide a guaranteed market for beef produced by Members
- Deliver a substantial price premium over the prevailing market
- Enhance the market value of calves emanating from participating dairy herds
- Provide leading-edge technical advice from birth to slaughter to enhance lifetime performance and reduce slaughter age
- Produce beef using high-quality farm inputs through a completely traceable closed loop supply chain
- Co-op member access to a world first Advance Payment Package.

Among the key objectives of the Club is reducing the average age of Club cattle at slaughter to 24 months or less compared with the current national average of 29 months for dairy beef cattle. This significantly reduces the average carbon footprint of the beef produced by members through a reduction in the average age of slaughter, the use of methane-reducing feed additives and improved feed conversion efficiency.

The combination of better genetics, nutrition management and farm husbandry also improves the consistency of the eating quality of Club produced beef. It was designed to deliver a marked increase in the proportion of dairy bred cattle meeting specified market targets and increase beef output and sales value per hectare through adherence to Club protocols.

A series of protocols underpin participation in the Club and include:

- Genetics
- Farm movements
- Welfare
- Nutrition and
- Animal Health

All beef-bred stock bulls for use in the programme must be genetically proven with a good track record, such as a Beef Sub Index within their Dairy Beef Index (DBI) evaluation of >€30. They must be pedigree registered and genotyped.

In addition, the dairy farmer-members are required to select bulls with a specified minimum Irish Cattle Breeding Federation (ICBF) Dairy Beef Index. All Members must be approved and fully compliant with Bord Bia's Sustainable Beef & Lamb Assurance Scheme (SBLAS) and as such, verified members of Ireland's award-winning sustainability programme, Origin Green.

There is a strong emphasis on both nutrition and animal welfare throughout the programme. To ensure the 'closed loop' traceability for key customers, all inputs such as feed/micronutrients and fertiliser, must be sourced and supplied by Glanbia Ireland thus offering complete traceability. Technical support is provided directly by our field teams and to supplement that during periods of restricted travel during 2020 we introduced online support and a monthly newsletter for Club Members to address technical support requirements.

Advance Payment

An Advance Payment Package is open to Glanbia Co-op members (Subject to Finance Ireland credit approval)

- Club Members can receive up to €770/animal over a 22-month period
- From month 3 to month 24 - €35/head paid on up to 90% of the animals contracted to the Club
- At slaughter, €770 plus the interest is repaid to the finance provider and balance paid to the farmer

The Pricing Model

The Club pricing structure sets out to reduce market volatility and provide price predictability. Glanbia were the first dairy Co-op in Ireland to introduce fixed price milk schemes and introducing a level of certainty in beef is an extension of that concept.

Pricing Framework

Market Price (AQP) + Club Premium + Club Protocol Bonus + Breed Bonus + Seasonality Bonus = Price paid to Twenty20 Club members

- The price paid is modelled on the Average Quoted Price (AQP) in the market (published by the agri media). This is the base price on the EUROP grid. A Club Premium is added.
- If the AQP is at €3.85 or above, the Club add a Premium of €0.15/kg carcass
- If the AQP is at or below €3.75/kg carcass, the Club add a Premium of €0.25/kg carcass
- If the AQP is between €3.75/kg and €3.85/kg then the Club add the amount required to bring the base price to €4.00/kg

Targets

- Currently there are over 300 members and 20,000+ animals with contracts in the Club and it is growing rapidly. There are 712 farmers with signed expressions of interest to participate. Our target is to grow that

“This is an exciting development, adding significant value for our farmer stakeholders, through science, agri-technologies and industry collaboration”.

Sean Molloy, Chief Agri Growth Officer, Glanbia Ireland.

number to 50,000+ in 2021 and within two years to be processing 1,000 animals per week.

- The methane output of animals produced under our protocols is currently being modelled and our feeding trial analysis is in process. These are purely for validation rather than being exploratory.

The Consumer

Glanbia Ireland is not involved in the sale of beef to the market and our innovation required partnering up with a reputable processor with a strong focus on value adding propositions.

We choose the Kepak Group.

The beef sector is faced with many challenges that impact beef consumption. Twenty20 beef is an innovative way of addressing these consumer concerns by producing beef that has less of an environmental impact, monitors animal welfare and offers enhanced transparency through an integrated closed-loop supply chain that consumers can trust.

We identified four key areas for Twenty20 to address in the consumer market;

Trust

- Trust is considered critical in the meat category and the Twenty20 traceability and provenance across the supply chain is world-leading.
- Within Twenty20 we have full visibility of breeding, nutrition, welfare and management providing unparalleled transparency.

Sustainability

- The Club protocols and nutritional practices will reduce the age of slaughter for the target carcass weight. There will be circa 20% reduction in CO2 equivalent per kg of beef.
- In addition to environmental sustainability, the Twenty20 beef club offers economic sustainability and fair trade to our farmers.

Animal Welfare

- The Twenty20 Beef Club is exclusive to farmers whose farms are Bord Bia Quality Assured and get independently audited regularly.
- Club rules permit a maximum of one herd movement during the animal's life cycle. We believe that our animal welfare practices will remove feelings of guilt associated with beef consumption.

Eating Quality

- Variation in eating quality is a key trigger for customer loss. Through genetic selection, animal group homogeneity, slaughter age and nutrition management we can deliver very consistent eating quality.

Value Creation

Participation

Almost 300 farmers have become Club members and committed their animals to the Club under a contract. There are currently just over 20,000 animals in the Club and processing of the first animals produced under Club protocols has begun.

Economic Value Creation

There are three components to value creation. These are:

- Genetic improvement
- Production cost reduction
- The Club's special pricing model and bonus system.

In addition, there are environmental benefits.

Genetic Improvement

Dairy farmers are provided with breeding advice and an approved list of beef sires that will add a minimum of €30 to the beef carcass (weight/conformation) based on their genetic evaluations.

https://www.icbf.com/wp/?page_id=12504

Each year, the Club will raise the requirement to add further genetic improvement and value to the beef offspring from the dairy herd.

Production costs

The key driver of reducing production cost is reducing the number of days that the animal must be maintained. Production trials at our research centres have shown that 63% of the food the animal consumes is used for maintenance. Increasing daily live weight gain to facilitate an average slaughter age of

24 months will reduce the cost of product by 11%. Currently, almost 50% of dairy beef animals do not attain their Quality Assurance bonus due to age and specification. To date, 93% of Club animals have met their Quality Assurance Bonus requirements worth €0.20/kg of carcass.

The Club's pricing model

Whilst the value of bonuses is driven by a number of factors, it is currently averaging >€100/animal based on the animals processed year to date.

To illustrate that, below is a specific example of one of the members that was featured recently by an Irish agricultural news website, Agriland.

The data presented includes summary slaughter data and a pricing summary is taken directly from the media feature published by Agriland.

Patrick Marnell's slaughter data for 51 animals –

Angus x Friesian: Average Carcass weight 310 kgs, R Grade = 53%, O grade = 47%, Fat score target = 93%,

Patrick's base price at the time of slaughter would have been €3.60. In addition, he received a Club protocol bonus of €0.20/kg, a Club Premium of €0.25/kg and a breed bonus of €0.10/kg. Taking into account all elements, his return per head was €108 above that available outside the Club.

<https://www.agriland.ie/farming-news/beef-focus-operating-a-50-head-finishing-enterprise-and-dairy-farm-in-co-kilkenny/>

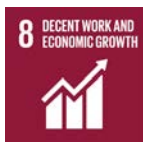
Scale up – value creation implications

The current number of animals contracted to the Club is over 21,000 but it is our clear plan to increase this number to 50,000. The bonus value on those animals will be circa €5.2 million - €5.4 million (specifications reached will determine the exact amount). The average number of animals contracted per farmer is currently 69.5 and on that basis the average value created per farmer per year would be approximately €7,350 (similar in scale to what the average beef farmer receives today in the CAP Basic Payment/Greening Scheme).

Environment & Climate

In recent years, significant attention has been placed on livestock with respect to their methane output and in particular that of beef cattle. A core objective of this innovation is to achieve target carcass weights at a significantly younger age. The current national average is 29 months (Source: Bord Bia). Our protocols will reduce that to an average of 24 months. "Earlier finishing reduces dairy beef or suckler beef GHG emission intensity by 10–20%" (Clarke et al., 2013; Murphy et al., 2017). This approach alone will reduce the carbon footprint of livestock produced by the Club by circa 15%. In addition, we are in the process of validating the impact of proven methane-reducing feed additives used in our feeds under Irish conditions.

SDGS:



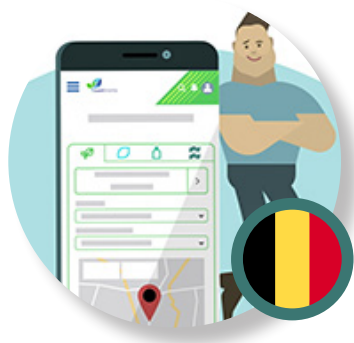


ECONOMIC VALUE CREATION

TRACEABILITY AND CONSUMER INFORMATION

ECONOMIC VALUE CREATION

TRACEABILITY AND CONSUMER INFORMATION



Association of Belgian Fruit and Vegetables Cooperatives - “Care4Growing”



Summary

“Care4Growing” is a multifunctional platform centred around data gathering and digitalisation that will transform the whole sector and provide new analytical capabilities that enable cooperatives and their members to optimise their performance in the supply chain.

As a first step on the digital roadmap, Care4Growing developed a handy digital tool, a virtual assistant, to help the fruit and vegetable producer on their journey from sowing and growing through to harvesting and delivery at the producer organisation (PO). In total, 100 functionalities, both existing and new services, were identified to optimise the production process. The overall objective of this tool is to help the grower to collect the necessary information for their production facility, to give them a 360° overview of their crops and thus optimise their total production process with higher efficiency being the main goal.

The management of this high-quality information will also form the basis of the producer’s pursuit of better quality and an optimal marketing of produce through the producer organisations. The possibility to use big data analyses and artificial intelligence on the gathered production data will provide new insights into the fruit and vegetable production process and will increase the profitability as a whole.

Background innovation - Intended purpose

In general, “Digitalisation in agriculture” refers to the use of information and communication technologies in the agricultural sector, but also the use of new digital technologies. All digital technologies make it possible to access, store, transfer and manipulate information, but also to analyse and make sense of it in order to transform agriculture into a more profitable, sustainable and inclusive sector. Digitalisation has a positive impact on productivity, market access, financial inclusion and service offering. The famous English autodidact Charles Darwin claimed that “It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change.”

When we talk about digitalisation, it is this change that we can also discover in our daily lives. Digitalisation is all around us: smartphones, artificial intelligence that tells you when you have to board your aeroplane, invoices that are sent electronically, banking apps that facilitate our financial bookkeeping, etc. Digitalisation is bringing about an evolution and revolution in agriculture and horticulture and can be compared to the introduction of the tractor.

Different European Union and Food and Agriculture Organisation studies predict that the digitalisation of food production will increase product quality, reduce production costs, enable farms to grow their crops with less material input such as plant protection and fertilisers. It will also increase efficiency and productivity taking into account an improvement of farms’ economic and environmental sustainability. Indeed, new technologies facilitate and accelerate price communication and also make it possible for producer communities to group together and control a larger share of the value chain. Connecting farmers through digitalisation facilitates their access to information on input and product markets as well as to advisory services.

The Innovation

In light of this, the three main Belgian horticultural cooperatives, BelOrta (www.belorta.be), Coöperatie Hoogstraten (www.hoogstraten.eu) and REO-veiling (www.reo.be), which bring together 2,400 active fruit and vegetable producers and have a total turnover of about 830 million euros, decided, under the umbrella of the association of producer organisations, LAVA (www.lava.be) and VBT (www.vbt.eu), to develop and construct a digital roadmap. Their aim was

to digitise the supply chain from the fruit and vegetable grower through to the consumer.

“When we look at today’s supply chain in the fruit and vegetable business, we discover a series of discrete steps involving marketing, product development, manufacturing, distribution, and eventually the customers”.

Supply chains are principally concerned with the flow of products and information between supply chain member organisations: procurement of materials, processing of materials into finished products, and the distribution of those products to end customers. Today’s information-driven, integrated supply chains are enabling organisations to reduce inventory and costs, add product value, expand resources, accelerate time to market, and retain customers.

Digitalisation will change this supply chain, pulling down walls and creating a completely integrated ecosystem that is fully transparent to all the players involved.

When conceiving and developing the digital roadmap, the three cooperatives did not start with the operational goals from which concepts are created and then fitted to customer demand. Instead, they started by understanding

and analysing the different production processes at producer level. With this knowledge, concepts were created and operational systems were built with the producer as a central starting point to find the answer to the following question: how can we help the day-to-day life of the producer by creating a paperless information hub in which all data is just one click away and can be used to optimise the production process and the supply chain between the production facilities and the producer organisations?

“Digitalisation is bringing about an evolution and revolution in agriculture and horticulture and can be compared to the introduction of the tractor. Care4growing will provide the roadmap and the appropriate support for the farmer and the PO to deal with this.”

Value Creation

When fully operational, the possibilities of the Care4Growing will be countless:

- Development of digital early warning systems for plant diseases to reduce the use of plant protection products and to contribute to sustainable production methods;
 - Development of heat maps for pests and diseases in the various production zones;
 - Elaboration of digital producer communities in which producers can communicate and exchange information on the growing season, the use of production factors;
 - Digitalisation of the quality controls on supplied produce;
 - Introduction of artificial intelligence and big data analyses on the production data in order to predict harvest and supply to the producer organisations and to optimise the marketing of the supplied fruit and vegetables;
- Introduction of the Internet of Things to accompany the measures, etc.
 - Digitalisation of the certification process to cope with customer demands related to production specifications with the possible introduction of blockchain technology;
 - Automatisation of data exchange between different actors in the supply chain within the ecosystem;
 - Creation of full traceability, etc.

SDGS:





Atria Plc. – Carbon Footprint Traceability

Summary

Atria was reportedly the first meat company in the world to introduce a carbon footprint for its chicken products on consumer packaging on 2nd December 2020. The traceability of the meat's raw materials to the farm has made it possible to mark the farm-level carbon footprint on a single product's packaging.

By introducing farm-level performance on consumer packaging labelling, Atria's approach also addresses consumer expectations in terms of short supply chains and family farming. Therefore, this carbon footprint label does not only strengthen the environmental work of farmers and our cooperatives. It also contributes to raising awareness of Atria's chain, which is owned by farmers and their families – the backbone of rural life.

Calculating the carbon footprint has shown that the measures already taken that have significantly shaped the Atria chain, such as investing in animal welfare, developing animal feed and replacing the use of soya with domestic protein sources, are highly effective climate actions. The calculation has also shown significant new development opportunities in Atria's chain. From the climate point of view, development potential lies in energy solutions for the premises and the use of renewable energy sources, for example, as well as innovations in manure treatment. Atria setting an example as an industry developer not only secures the future of the Atria chain, it also creates consumer confidence that food production offers solutions to the climate issue.

Background innovation - Intended purpose

Public debate and numerous consumer studies have shown that consumers are genuinely concerned about climate change and the effects of diet on the climate. Atria is aware of this common concern and wants to be part of the solution. Therefore, combating climate change and achieving a carbon-neutral food chain by 2035 are the company's main goals. With the carbon footprint label, Atria provides consumers with information on the climate impact of its products.

Identifying the carbon footprint of its operations, understanding where emissions come from, how to reduce them and how to implement a carbon-neutral food chain are all central to Atria's climate work. In addition to its own industrial operations, Atria has also developed primary production processes in cooperation with its producers in order to reduce the environmental impact of the entire food chain.

The Innovation

The traceability of the meat's raw materials to the farm makes it possible to mark the farm-level carbon footprint on a single product's packaging.

Atria's opening in this field is bold albeit incomplete. It shows a commitment to transparent and genuine climate work, which challenges the scientific community to produce the research data needed to measure climate impact even more accurately.

Atria's chain plays a significant role in the sustainable development of Nordic food production. In food production, the main environmental and climate impacts lie in primary production. Calculating the carbon footprint of Atria's food chain has marked a significant step in identifying emission sources and applying measures in a targeted manner.

"Calculating the carbon footprint in our contract production farms (cattle, pigs, broilers) has shown that the Atria way of producing meat can withstand international scrutiny in climate matters. At the same time, the calculation has provided producers with concrete tools to reduce the climate impact of their farm and verified the effectiveness of the long-term work done earlier in the chain from a climate perspective".

By introducing farm-level performance on consumer packaging labelling, Atria's approach also addresses consumer expectations in terms of short supply chains and family farming. Therefore, "this carbon footprint label does not only strengthen the environmental work of farmers and our cooperatives. It also contributes to raising awareness of Atria's chain, which is owned by farmers and their families – the backbone of rural life."

Value Creation

Calculating the carbon footprint has shown that the actions already taken, such as investing in animal welfare, developing animal feed and replacing the use of soya with domestic protein sources, are highly effective in preventing global warming. The calculation has also shown significant new development opportunities in Atria's chain. From the climate point of view, development potential lies in energy solutions for the premises and the use of renewable energy sources, for example, as well as innovations in manure treatment.

Atria setting an example as an industry developer not only secures the future of the Atria chain, it also creates consumer confidence that food production offers solutions to the climate issue.

Calculating the carbon footprint has shown that the actions already taken, such as investing in animal welfare, developing animal feed and replacing

the use of soya with domestic protein sources, are highly effective in preventing global warming. The calculation has also shown significant new development opportunities in Atria's chain. From the climate point of view, development potential lies in energy solutions for the premises and the use of renewable energy sources, for example, as well as innovations in manure treatment. Atria setting an example as an industry developer not only secures the future of the Atria chain, it also creates consumer confidence that food production offers solutions to the climate issue.

“More than half of the chicken’s carbon footprint comes from feed and the soya used in it. The carbon footprint has decreased since Atria’s production chain has been able to reduce the use of soy. Good health is the most important factor when it comes to reducing soya consumption. Healthier birds need less protein. A healthy bird can use the feed for growth rather than to maintain its immune system”.

SDGs:





Caves de Rauzan – Collaboration along the value chain to harness the power of blockchain

Summary

The Caves de Rauzan, in partnership with Carrefour (through its Maison Johanès Boubée wine sector) took part in the production of the first wine to use blockchain. The aim of this innovation is to respond to the needs and expectations of consumers in terms of transparency and reassurance in products.

It is a tamper-proof technology for storing and transmitting information that operates without a central control body and is secure and distributed. It contains a record of all exchanges between users since its creation. It is shared by its various users, without any intermediary, which allows everyone to check the validity of the chain. This project contributes to the societal issues of transparency and reassurance in products and thus directly meets the Sustainable Development Goals (SDG 9, 12 and 17).

Blockchain is a technological innovation for storing and publishing information on product traceability. Thanks to blockchain, the information is: shared in the form of copied, distributed and secure events that cannot be falsified.

The data is thus shared between all users: producers, processors, bottlers, retailers and consumers. “This project was carried out thanks to the involvement of the entire chain, from the producer through to the retailer”.

In the run-up to the project, the Caves de Rauzan were identified by Carrefour as a “responsible” supplier. Enthusiastic about the innovative and collective nature of this project, the Caves de Rauzan joined the project. Carrefour blockchain teams came to present the approach to the cooperative, accompanied by Maison Johanès Boubée in May 2019. A broader project group was set up with Terre de Vignerons (bottler) following this event. Weekly sessions were quickly set up to frame the project milestones and to monitor actions and the IT development of the wine blockchain solution. These involved the Caves de Rauzan, Terre de Vignerons, Maison Johanès Boubée and Carrefour.

Each player shared their traceability data in an exhaustive and transparent way and then identified the keys to link the information (batch number, barrel number, date of receipt, etc.). Each actor involved their stakeholders in the project: winegrowers, laboratories, bottlers, certification bodies, etc.

After developing the tool, everyone tested the data import. At the same time, working with the printers made it possible to find a solution to implementing the QR code on the product label.

The product was placed on the market in February 2020 and from 10th February to 6th April 2020 its QR code was scanned almost 500 times.

The first traceability system for an organic wine was officially launched by all the stakeholders on 14th February 2020 at the “Cité du Vin” in Bordeaux. “Thanks to the QR Code on the label, consumers can access via their smartphone an interface containing a wealth of information on the product’s journey from the place of ageing or production, through to its placement on the shelves by the retailer”.

In terms of results, after the product was placed on the market, “we recorded QR code scans for this product in more than 15 different countries”. Each of the players contributed their business expertise and the specificities linked to their entity. This represents a joint approach between Caves Rauzan and Carrefour, both of which are highly committed to Corporate Social Responsibility (CSR).

This approach represents an innovation in the wine industry.

Background innovation - Intended purpose

The objective of this innovation is to meet the needs and expectations of consumers in terms of transparency and reassurance in products.

Using blockchain for food is a response to this need. It is a technology for storing and transmitting information, that is transparent, tamper-proof, operates without a central control body, and that is secure and distributed. It also contains a record of all exchanges between users since its creation. It is shared by its various users, without intermediaries, which allows each user to check the validity of the chain.

This project contributes to the societal challenges of transparency and reassurance in products and thus directly meets the Sustainable Development Goals (SDG 9, 12 and 17).

The Innovation

Blockchain is a technological innovation for storing and publishing information on product traceability.

Thanks to the QR Code on the label, consumers can access via their smartphone an interface containing a wealth of information on the product's journey from the place of breeding or production, through to the moment it is placed on the shelves by the retailer.

Thanks to blockchain, the information is shared in the form of events that cannot be falsified, copied, distributed and that are immutable and secure.

Blockchain can be defined as a totally secure technology for collecting, storing and transmitting information. This technology allows data to be collected directly from the players in the sector. It is then stored in a secure and unalterable way.

This original data is thus shared between all users: producers, processors, bottlers, retailers and consumers.

This project was carried out thanks to the involvement of the entire chain, from the producer through to the retailer. In the run-up to the project, the Caves de Rauzan were identified by Carrefour as a “responsible” supplier. Enthusiastic about the innovative and collective nature of this project, the Caves de Rauzan joined and the Carrefour blockchain teams came to present the approach to the Cooperative, accompanied by Maison Johanès Boubée in May 2019. A broader project group at Terre de Vignerons (bottler) was formed in the process. Weekly sessions were quickly set up to frame the project milestones and to monitor actions and the IT development of the wine blockchain solution. These involved the Caves de Rauzan, Terre de Vignerons, Maison Johanès Boubée and Carrefour.

Each actor shared their traceability data in an exhaustive and transparent way to then identify the keys to link the information (batch number, barrel number, date of receipt, etc.). They also committed their stakeholders to the project, including winemakers, laboratories, bottlers, certification bodies, etc.

After developing the tool, everyone tested the data import. At the same time, working with the printers made it possible to find a solution to implementing the QR code on the product label.

As far as the Caves de Rauzan are concerned, three departments worked together in the development of this project:

- the vineyard department, in charge of supporting the winegrowers, who benefit from the technical knowledge related to the field, contact with the operators and dealing with the possible problems related to data collection.
- The production department, in charge of monitoring the harvest from the moment it is received until it leaves our cellars, uses the different vinification and maturing processes and controls the analytical monitoring of the products.
- The CSR department, whose mission is to coordinate interactions and monitor the progress of cross-functional projects, to ensure the planning, monitoring and implementation of actions while ensuring reporting.

Project progress was thus presented regularly, with decisions taken without delay and in a collegial manner. The collection of information, the development



“A perfect illustration of collective intelligence and the principle: alone we go faster, together we go further.”

of the tool, the design of the consumer view, and the solution for printing the QR code were all validated by everyone without slowing down the pace of the project.

Once the developments were completed and the solutions made available, the team proceeded with all the tests to ensure that the system would work well for the consumer, in parallel with the maturing and bottling of the 2019 vintage.

In these cross-functional projects, a rigorous planning method was required. Firstly, this ensures that each sub-part of the project (or stage) is well maintained by one of the stakeholders, or that there is no overlap in the distribution of tasks. This also provides an overview. The deployment of the steps then allows us to consider the different items in greater detail and depth, and to plan ahead more easily.

The first blockchain-based traceability of an organic wine was launched by all the actors on 14th February 2020 at the Cité du Vin in Bordeaux. Each of the players contributed their business expertise and the specificities linked to their entity. This represents a joint approach between Caves Rauzan and Carrefour, which are both very committed to CSR.

It is an innovative approach in the wine industry that meets a growing consumer demand for food traceability.

Value Creation

The product was placed on the market in February 2020 and from 10th February to 6th April 2020 its QR code was scanned almost 500 times.

It has been positively received by professionals and consumers and has enjoyed good press coverage with 15 spin-offs (January-February 2020).

In terms of results, after the product was placed on the market, we recorded QR code scans for this product in more than 15 different countries'. This approach represents an innovation in the wine industry.

SDGs





ENVIRONMENT VALUE CREATION

BIOECONOMY & CIRCULARITY



ENVIRONMENT VALUE CREATION

BIOECONOMY & CIRCULARITY



Càmara Arrosera del Montsià i Secció de Crèdit, S.C.C.L. – Circular economy and a creation of value that disrupt the plastic market



Summary

Camara Arrosera del Montsià have created ORYZITE, a plastic substitute made from rice husks. This new material is the result of a circular economy project and the valorisation of rice by-products after more 10 years of research and product development.

The main by-product of rice is the rice husk and thanks to our circular economy project, we have been able to reconvert the rice husk into a new material that replaces plastic. We say that the more kilogrammes of Oryzite you put on the market, the less kilogrammes of plastic you release into the environment, and in doing so reduce the carbon footprint.

The production of Oryzite, which is carried out in the same plant where Cámara Arrosera del Montsià processes the rice, has multiple benefits such as reducing CO₂, or reducing the carbon footprint and energy consumption. Thus, the rice husk has become a very useful and innovative component, giving rise to Oryzite as a clear example of circular economy: it uses the least amount of resources and produces the least waste. This revolutionary material will replace plastic in products from various industries such as automotive, logistics, packaging or furniture.

As a result of the cooperative's commitment to the environment and the collaboration with Iban Ganduxé, we have been able to reclaim the value of a by-product such as rice husks. We are working on a new strategic project for the cooperative that is going to add value to a basic product such as rice and therefore provide better results. In addition, with the creation of Oryzite we have managed to bring an innovation from the primary sector to the industrial sector, generating great competitive advantages for this sector too. "We know and have proven that thanks to the use of Oryzite as a substitute for plastic in industrial processes, improvements in productivity, energy consumption and raw material costs are achieved".

This innovation has already been accepted by actors in the industrial sector such as SEAT, NUPIK INTERNATIONAL, ROCA or NUPSUS, among other large multinational companies that also have circular economy projects and sustainable improvements as part of their strategic plans. These companies see ORYZITE as a present and future solution to make their production plants more sustainable.

As required, we have provided the following links to videos where everybody can see the main results and uses of Oryzite.

Background innovation - Intended purpose

The Arrosera del Montsià Chamber is an agricultural cooperative founded in 1927 that brings together more than 2,500 members dedicated to growing, processing and marketing rice under the Protected Designation of Origin "Arroz del Delta del Ebro".

The cooperative mission is focused on offering consumers and clients rice of the best quality and variety, as well as preserving the natural wealth of the Ebro Delta and its Natural Park, considered the second most important in the European Union.


In recent years, even decades, society has seen how plastic waste has overflowed and is flooding the environment, which constitutes a serious problem for

the planet. For the cooperative, the commitment to sustainable development must involve the entire value chain and working on complete ecosystems to allow the reduction and continuous recycling of plastic.

"Faced with this situation and in order to comply with the mission, vision and values of the Cooperative, we decided to act". Within the different strategic lines of the Cooperative, the commitment to carry out a business activity that is respectful of the environment stands out.

In this sense, over 10 years ago, the cooperative started a disruptive circular economy project that valorises rice by-products which will help to reduce the negative impact of plastics on the environment.

The Innovation



"We are very excited about this project with which we hope to contribute within our possibilities to the improvement of the ecosystem of the Ebro Delta, and the planet in general."

The Arrossera del Montsià Chamber has created ORYZITE, a plastic substitute made from rice husks.

This material, called Oryzite, is the result of a project of circular economy and valorisation of the rice by-products from more than ten years of research and development.

Among the by-products of rice we find the rice husk, which we have been able to reconvert into a new material to replace plastic thanks to our circular economy project. For every kilogramme of Oryzite there is one less kilogramme of plastic on the planet and, at the same time, a reduction in the carbon footprint.

Oryzite's production, which takes place in the same plant where Càmara Arrossera del Montsià processes the rice, has multiple benefits such as reducing CO₂, the carbon footprint and energy consumption. Thus, the rice husk has become a very useful and innovative component, giving rise to Oryzite as a clear example of circular economy: it uses the least amount of resources and produces the least waste. This revolutionary material will replace plastic in products of several industries such as automotive, logistics, textiles, packaging or furniture.

As a result of the cooperative's commitment to the environment and the collaboration with Iban Ganduxé, the cooperative has been able to reclaim the value of a by-product such as rice husks. The cooperative are working on a new strategic project that is going to bring added value to a basic product like rice and therefore better results. Furthermore, with the creation of Oryzite the cooperative has managed to bring an innovation from the primary sector to the industrial sector, generating great competitive advantages in this sector as well. "We know and have

proven that thanks to the use of Oryzite as a substitute for plastic in industrial processes, improvements in productivity, energy consumption and raw material costs are achieved".

This innovation has already been accepted by actors in the industrial sector such as SEAT, NUPIK INTERNATIONAL, ROCA or NUPSUS among other large multinational companies that also have projects of circular economy and sustainable improvement as part of their strategic plans. These companies see ORYZITE as a present and future solution to make their production plants more sustainable.

Value Creation

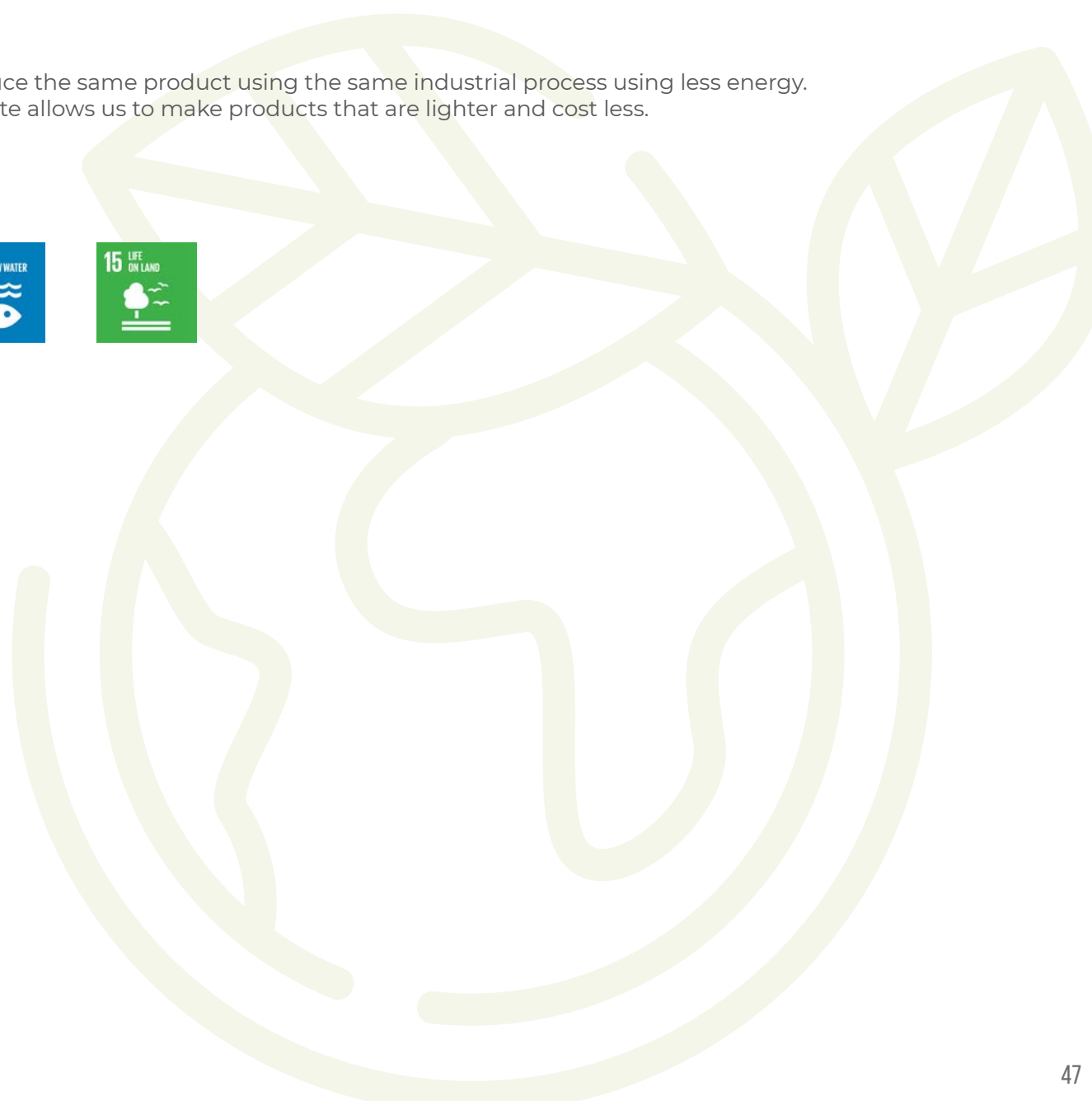
With this innovation we convert rice by-products into highly valued co-products and new raw materials. We are already beginning to see the depletion of a number of NATURAL RESOURCES and SOLID FUELS. Most plastics are synthetic materials obtained from petroleum derivatives and other natural

substances and with a high resistance to environmental degradation. At Oryzite, we believe it is necessary and urgent to find ways to help reduce the use of these resources, reduce waste production and limit energy consumption in industrial production processes. The world is changing and the plastic market with it. Consumers are asking for products made with materials that are sustainable, since we already have gigantic marine dumps like the so-called “plastic soup”, the largest landfill in the world.

With Oryzite we promote:

- A reduction of 145,600,000 kg of CO2 in the atmosphere.
- An improvement in energy efficiency. We are able to produce the same product using the same industrial process using less energy.
- A reduction of raw material costs. The composition of Oryzite allows us to make products that are lighter and cost less.

SDGS:





Caviro - closing the loop is one of the priority

Summary

In recent years, the cooperative group has invested over 100 million euro to develop a new circular economy model. Every day, Caviro strives to preserve the value of natural resources. Recycling and regeneration of products and materials from the vineyards allow the Group to reduce the use of raw materials and energy at the source. Major innovations have been achieved through significant investments in water consumption reduction and renewable energy production. Starting from the fields, Caviro focused on the reduction of traditional irrigation systems in favour of targeted systems, also combined with organic fertilization using compost to improve the soil, thus requiring less use of water. In the Forli winery, the largest bottling site in Italy, Caviro has built a plant that recovers waste water from production processes. All the water now passes through ultrafiltration technology with MBR (immersed membranes) which purifies it and brings it back to drinking quality, making it possible to reinsert it in the

upstream stage of the production cycle. The non-potable portion however has excellent characteristics and is used for non-food uses such as irrigation and fire-fighting systems.

This innovation allows the cooperative to increase its environmental sustainability, and reduces the risk of production blocks in case of water resource scarcity.

This new water recovery plant allows the production of 9,000 litres of drinking water per hour, with an annual potential of approximately 75 million litres, which will allow an equal amount of water extraction from groundwater.

The goal of this plant is to reduce the water taken from the groundwater by 35%.

From the processing of wine, tons of raw materials are obtained, such as lees, marc and grape seeds, ready to be transformed into ingredients and products with high added value. After the phases of extraction and valorization of high-value products from the derivatives of the supply chain, the subsequent derivatives are still rich in organic substances and nutrients and instead of being dispersed in the environment generating ecological problems, they are further used in the value chain.

The last residues of all the processes, which are still rich in organic matter, are used to produce biogas in anaerobic digestion, thermal and electric renewable energy and natural soil enhancers which are returned to the fields, thus returning the fundamental nutrients and closing the cycle.

The liquid residues of processing are sent to anaerobic digestion plants, i.e. bio-reactors designed to maintain the ideal conditions for the life of specific micro-organisms. These bacteria are fed with agro-industrial waste, which represents their food, and they feed on it, reducing the organic pollutant load by 95%, thus carrying out an important purification process and at the same time producing biogas, consisting of methane and carbon dioxide. What remains is a digestate that can be returned to the soil for the fertilization of fields.

Having already achieved electrical and thermal self-sufficiency, Caviro has decided to undertake the production of advanced biofuels, i.e. generated and produced from waste.

Caviro has therefore designed and built two biogas to biomethane upgrading plants which receive the biogas generated in anaerobic digestion and purify it through a series of filters, in order to separate methane molecules from carbon dioxide ones to obtain high-quality biofuel. This technology exploits the physical properties of gases and does not require the use of potentially harmful chemical reagents.

Caviro has also completed the construction of a plant capable of recovering and purifying the flow of carbon dioxide discarded by the processing plants, bringing it to the highest quality level recognized internationally for alimentary use and thus avoiding its dispersion into the atmosphere.

Since its start-up in 2019, Caviro Extra's plants have had an input capacity of 3,000 m³/h of biogas and annually produce about 9 million cubic meters of advanced biomethane, with which it is possible to meet the annual needs of about 18,000 cars on average.

The plant was the first and largest in terms of size built in the agro-industrial sector in Italy.

The CO₂ capture and liquefaction plant started production in 2020 and has an input capacity of 550 m³/h of raw CO₂ and is able to recover and produce 7,000 tons per year of purified liquefied CO₂.

Caviro, in their pursuit of continuous innovation, is also looking into the construction of an additional plant that will also allow the liquefaction of biomethane in order to use it to fuel the same trucks that transport wines and by-products of the supply chain, thus adding a further step to the circularity of the system.

Background innovation - Intended purpose

In recent years Caviro has worked on 3 strategic objectives concerning its production chain: cost reduction of the entire supply chain from the field to wines for consumption; automation of the optimization of processes; recovery and enhancement of by-products. Major innovations have been made with significant investments in water and energy processes. Optimizations have been achieved in the vineyard through an increase in mechanization, a reduction of traditional chemical treatments, and a reduction of traditional irrigation systems in favour of targeted systems, also combined with organic fertilization using compost to improve the soil thus requiring less use of water. Improvement of winemaking processes with greater production automation, automatic warehouses for storage and optimization of packaging for a lower carbon footprint through improvement of transport (in picking) by eliminating waste due to non-optimized journeys.

Moreover, processed waste water from the Italian agro-food industry is purified and returned to the same production cycle. The last residues of all the processes, which are still rich in organic matter, are used to produce biogas in anaerobic digestion, thermal and electric renewable energy and natural soil enhancers which are returned to the fields, thus returning the fundamental nutrients and closing the cycle.

Moreover, processed waste water from the Italian agro-food industry is purified and returned to the same production cycle. The last residues of all the processes, which are still rich in organic matter, are used to produce biogas in anaerobic digestion, thermal and electric renewable energy and natural soil enhancers which are returned to the fields, thus returning the fundamental nutrients and closing the cycle.

“For the Group, it is a priority to continue to invest in support for the environment and sustainability.”

Lazzarini Stefano, Chairman of Cantina Forlì Predappio

The Innovation

INNOVATION 1 - WATER RECOVERY IN THE CELLAR

Many production processes, especially in the food industry, require the use of large quantities of water to ensure proper conditions of hygiene and health. In recent years, however, we have been witnessing a progressive reduction in the availability of this very important resource due to the massive use and reduced replenishment of the water table caused by climate change. With this in mind, the Caviro cooperative has decided to invest and innovate in a very strong way, with the aim of reducing its water footprint significantly. In the Forlì winery, the largest bottling site in Italy, Caviro has built a plant that recovers waste water from production processes.

All the water, which was previously sent to the purifier and then discharged into surface water, now goes through an ultrafiltration technology with MBR (immersed membranes) that purifies it from all solids and suspended substances. This first process allows us to send a portion of it to a subsequent reverse osmosis purification section that is able to restore it to drinking water quality and then reintroduce it at the beginning of the production cycle. The non-potable portion however has excellent characteristics and is used for non-food uses such as irrigation and fire-fighting systems. In addition to increasing the environmental sustainability, this innovation also allows the cooperative to obtain an important competitive advantage because by reducing its dependence on the use of groundwater, it reduces the risk of having production blocks in case of scarcity of water resources.

INNOVATION 2 - ADVANCED BIOMETHANE PROJECT FOR SELF EXTRACTION and CO2 RECOVERY

The valorization of the by-products of the wine and food chain is an aspect of prime importance and the cooperative has made important innovative

investments with a strong imprint on sustainability. From wine processing, by-products such as dregs and marc are obtained, ready to be transformed into ingredients and products with high added value.

Through technological and process expertise, Caviro obtains alcohols and distillates for food, pharmaceutical, sanitization and industrial use, musts for food and oenological use, grape seeds for the extraction of polyphenols and valuable oil, encyanine, a red dye of natural origin, and tartaric acid for food and pharmaceutical use. After the phases of extraction and valorization of high-value products from the derivatives of the supply chain, the subsequent derivatives are still rich in organic substances and nutrients and instead of being dispersed in the environment generating ecological problems, they are further used in the value chain. The liquid residues of processing are sent to anaerobic digestion plants, i.e. bio-reactors designed to maintain the ideal conditions for the life of specific micro-organisms.

These bacteria are fed with agro-industrial waste, which represents their food, and they feed on it, reducing the organic pollutant load by 95%, thus carrying out an important purification process and at the same time producing biogas, consisting of methane and carbon dioxide. What remains is a digestate that can be returned to the soil for the fertilization of fields.

Caviro has decided to implement an innovation in the wake of the new challenges set by the EU 20-20-20 Plan, which envisaged reducing greenhouse gas emissions by 20%, raising the share of energy produced from renewable sources to 20% and increasing energy savings to 20% by 2020.

Having already achieved electrical and thermal self-sufficiency, Caviro has decided to undertake the production of advanced biofuels, i.e. generated and produced from waste, thus combining the value of renewability with that of sustainability and innovation.

Caviro has therefore designed and built two biogas to biomethane upgrading plants which receive the biogas generated in anaerobic digestion and purify it through a series of filters, in order to separate methane molecules from carbon dioxide ones, thanks to their different atomic size, using membranes with microscopic pores. This technology, selected in collaboration with the University of Bologna, exploits the physical properties of gases and does not require the use of potentially harmful chemical reagents.

The best plant designs were selected to minimize the visual and acoustic impacts on the surrounding environment, producing solutions that are well integrated into the surroundings, allowing Caviro to create a natural oasis where a large population of storks, among others, has found the ideal habitat.

The initiative therefore started in 2018, immediately after the issuance of the new Italian legislation regulating biofuels, and saw an investment amounting to 9 million euros.

However, the technology selected for the upgrading had a further objective, namely to supply not only pure biomethane, but to also produce very concentrated carbon dioxide, also generated by the biological processes of anaerobic digestion.

In 2019, immediately after the realization of the biomethane plant, Caviro started with the realization of a plant capable of recovering and purifying also this carbon dioxide, bringing it to the highest internationally recognized quality level and thus avoiding its dispersion into the atmosphere.

The gas is then cooled to -30°C and liquefied to be used for food and beverage production of mineral water, carbonated soft drinks and beer.

The environmental benefit of this intervention is evident as this production of CO_2 has replaced the extraction from underground deposits of fossil CO_2 used for the same purposes.

The purified and liquefied CO_2 can also be transformed into dry ice in a solid state and at a temperature of -78°C , which can potentially be used for many purposes in the cold chain, such as the transport and storage of vaccines.

These plants allow the total recovery of the material that enters our site as waste and they also use only renewable energy produced on-site from biomass. In addition to the environmental benefits, with these innovations Caviro has obtained important competitive advantages for the growth of business and profitability related to the valorization of agro-industrial waste. It has opened up new sectors such as the production of biofuels and CO_2 for food use, which have increased their revenues and the number of staff employed. "The economic benefits of the innovations are returned to the farmers who are members of the wineries in the form of a higher return on their product, the grapes".

Value Creation

INNOVATION 1 - WATER RECOVERY IN THE CELLAR

The plant was built and tested in September 2020 and is now fully operational.

It allows the production of 9,000 liters/hour of drinking water, with an annual potential of about 75 million liters, which will allow a reduction of the withdrawal from the aquifer by the same amount.

The objective of this plant is to reduce the water withdrawn from the aquifer by 35%.

The system is also designed in a modular way and the cooperative is already studying its future expansions to achieve greater autonomy and environmental sustainability.

INNOVATION 2 - ADVANCED BIOMETHANE PROJECT FOR SELF EXTRACTION AND CO2 RECOVERY

Upgrading was completed in mid-2019, when biomethane started to be fed into the gas network. Special contracts were used to enable distribution to gas vehicle refueling stations, which are very widespread in Italy.

This biomethane has received sustainability certification from certified bodies. Several studies have also shown how powering a car with advanced biomethane leads to a very high reduction in environmental impact and greenhouse gas emissions, comparable only to electric cars powered by wind power. Since its start-up in 2019, Caviro Extra's plants have had an input capacity of 3,000 m³/h of biogas and annually produce about 9 million cubic meters of advanced biomethane, with which it is possible to meet the annual needs of about 18,000 medium-sized cars.

The plant was the first and the largest in terms of size realized in the agro-industrial sector in Italy.

The CO₂ capture and liquefaction plant started up in 2020 has an input capacity of 550 m³/h of raw CO₂ and is able to recover and produce 7,000 tons per year of purified liquefied CO₂. The CO₂ purification and liquefaction plant has obtained health authorization from the local public health department for the production of additives and ingredients for food use.

Both advanced biomethane and CO₂ for food use are sold on the market as high quality products. Given the great success, Caviro is also planning to increase related business.

Today Caviro, in their pursuit of continuous innovation, is also looking into the realization of a further plant that will allow the liquefaction of biomethane in order to use it to fuel the same trucks that transport wines and by-products of the supply chain, thus adding a further step to the circularity of the system.

SDGS:





SODRA - OnceMore® to make the textile industry more sustainable

Summary

Södra's innovation OnceMore® addresses several of the UN 2030 sustainable development goals, most specifically numbers 12, 9, 11 and 13, in large scale. Södra is a cooperative forest association of 53 000 forest owners in the south of Sweden with a mission to promote the profitability of the members' forest estates, and to secure markets for their forest raw material. The innovation strengthens Södra's position in the dissolving pulp market. OnceMore® promote the spread and perception of the Södra trademark, which promotes all of the company's businesses, creating value for our forest owners as well as strengthening the employer brand, creating possibilities for the future of the company.

The concept of OnceMore® is a solution for the textile industry for solving the problem of circularity. In the textile sector, less than 1% of the fibres are recycled today – 99% end up on landfills or being incinerated. With this innovation the amount of textile waste is reduced. The need for new textile fibres is also reduced. This has a major environmental impact, depending on which fibres are being replaced with the recycled ones. For polyester, it has an effect on the climate (less use of fossil oil) and it decreases water pollution as polyester ends up as plastic particles in the oceans when clothes are washed. For viscose from wood, the wood is saved or put into better use. For cotton, the land is freed up for agricultural use and food production and lots of water is saved, as cotton needs a lot of water to grow.

In 2016 the idea that now has become OnceMore®, came up in Södra's Innovation department. Since then Södra has taken the idea from lab trials and testing to mill-scale trials and production – in only 4 years. The process has been developed in-house with the support of our owners. The project is one of Södra's strategic projects and the work is carried out in several areas – from raw material sourcing, through development of production facilities to customer contacts, development and sustainability studies. In total, more than 70 employees of Södra are directly involved. Partnerships of different kinds have been established throughout the textile value chain, from suppliers to customers and brands.

For the innovative process behind OnceMore® a patent has been applied for. The most important step in the unique process is a separation of polyester and cotton. Up until now it has been very difficult to handle mixed material for recycling. Polycotton – a blend of polyester and cotton – is very commonly used in fabrics. In total, more than 80% of the textile fibres used are either cotton or polyester. After separating polyester from cotton, the cotton, which consists of cellulose, is mixed with cellulose from wood. The cellulose from the wood and from the used textiles is then processed in the pulp mill production line to produce dissolving pulp of high quality. The OnceMore® technique can be scaled up rather easily in a resource efficient and sustainable way as part of the process is already used in the mill, with the use of wood raw material as a standard. The polyester is sent to the mill's highly efficient energy facility and burned producing electricity and heat in the process.

Up until now more than 600 tonnes of pulp have been placed on the market, and up to 20% of the raw material is recycled textiles. The capacity of production of OnceMore® pulp has increased to a level of handling 300 tonnes of textile waste annually. The content of recycled textiles in the pulp has increased from 3% to 20% in just one year. The pulp is turned into viscose fibers and fabrics of good quality. We have also set up supply logistics for the textile waste and initiated contacts and partnerships with suppliers, customers, brands, authorities and NGOs all over Europe. The project crew of Södra is set to increase our capacity further and the goal is set for a processing capacity of 25 000 tonnes of recycled textiles in 2025.

Background innovation - Intended purpose

In the paper sector, almost 50% of the fibres used are recycled. In the textile sector, less than 1% of the fibres that are recycled – 99% end up on landfills or incinerated. As textiles most often are mixed materials it has been a challenge to recycle them. With the innovation OnceMore® the cooperative can change this. Textiles of blended materials can be recycled and turned into new textile fibres – the forest makes it possible. The cooperative uses its existing pulp mill for dissolving pulp. The recycled textiles are mixed with cellulose from the wood in our OnceMore® dissolving pulp. "With this innovation we deliver a solution for circularity in the textile industry, which is highly sought after by the brands and the whole textile industry. With this innovation we increase the value of the forest for our owners, while doing something positive for the planet at the same time."

The Innovation

In 2016 the idea that now has become OnceMore®, came up in Södra's Innovation department. Since then Södra has taken the idea from lab trials and testing to mill-scale trials and production – in only 4 years. The process has been developed in-house, in Södra's own organisation, with the support of our owners. Today the project is one of Södra's strategic projects, the work is carried out in seven different sub-projects, with in total more than 70 Södra employees directly involved. Partnerships of different kinds have been established throughout the textile value chain, from suppliers to customers and brands. Sourcing of raw material is one very important and challenging task as today there is no market for textile waste of this kind. Södra has therefore established contacts with several suppliers and built up the logistics needed to get the textile waste to the mill. The experience within the company with sourcing of wood from our industries with a complex logistics network has been useful in setting up a new logistics system for textile waste.

“A global breakthrough opening up the possibility to recycle mixed textiles through production of dissolving pulp, which can be used to make new textiles.”

Lena Ek, chairman of the Södra board

For the innovative process behind OnceMore® a patent has been applied for, detailed information cannot be revealed for competition reasons. The most important step in the unique process is a separation of polyester and cotton. Up until now it has been very difficult to handle mixed material for recycling. Polycotton – a blend of polyester and cotton – is very commonly used in fabrics. If you look at the different textile fibres used in the world over 60% is synthetic, polyester the most widely used of them, and about 25% is cotton. So with the OnceMore® technique a lot of the textile waste in the world can be handled thanks to the ability to separate cotton from polyester. After separating polyester from cotton, the cotton, which consists of cellulose, is mixed with cellulose from wood. The cellulose from the wood and from the used textiles is then processed in the pulp mill production line to produce dissolving pulp of high quality. Due to possible combination with existing production lines, the OnceMore® technique can be rather easily scaled up in a resource efficient and sustainable way. All the know-how, development, investments and experience that have been built up in Södra since the start in 1938 is used to make this new recycled product possible. The polyester is sent to the mill's highly efficient energy facility and burned producing electricity and heat in the process.

The project also works on development issues such as optimizing the process, looking into handling of coloured fabrics in the future as well as other types of textile fibres. Polyester is being investigated to explore if it could be extracted and used for other purposes than energy. Sustainability is examined and optimized for this new product and as

certification of wood (FSC, PEFC) is standard within Södra, the new product has been certified according to RCS, Recycled Claim Standard. An LCA is currently being performed for OnceMore® products.

The OnceMore® production site has been progressing both in terms of increased capacity and increased ratio of recycled cotton in pulp. In 2019, 20 tonnes of used textiles were used in the mill. In 2020, new equipment was installed to increase the capacity to 300 tonnes of used textiles annually. In the 2019 trials, the OnceMore® pulp contained 3% cotton. Thanks to the new equipment, we have now reached 20%. The plan for the future is to increase the capacity and ratio of cotton step-by-step to have the capacity for 25 000 tonnes in 2025 with 50% used textiles in the pulp.

Customers and brands have shown great interest in this new product, discussing possibilities for now and for the future. Södra is a rather small player on the dissolving pulp market, but with this concept we stand out as innovative and able to give our customers and the brands what they are looking for.

The improvement of Södra's competitive position is the result of several factors. Södra's mission is to promote the profitability of our members' forest estates, and to secure markets for their forest raw material. Our position as a dissolving pulp producer is quite small on the market, but with OnceMore® it is highly strengthened. The concept of OnceMore® as a highly sustainable product that provides the textile industry with a solution for the problem of circularity gives our owners pride and strengthens the company trademark. This in turn promotes all of the company's businesses, creating value for our forest owners as well as strengthening the employer brand, creating possibilities for the future of the company.

Today Södra's industry is mostly sourced with wood from our members forest, but some is also imported. This part can be exchanged for the new raw material – textile waste – when making dissolving pulp. The new raw material does thus not compete with the use of our owner's forests, but rather makes the wood more valuable when mixed with used textiles. The new OnceMore® product is highly competitive in the market and ensures a future profitable use of our members' forests.

Value Creation

With OnceMore® the possibility of circularity on a large scale is introduced to the textile industry, where today less than 1% is being recycled. The total amount of textile fibres being put on to the market each year is currently just over 100 million tonnes. Our contribution so far is minor – about 100 tonnes recycled. Even with the cooperative's plans for 2025 to recycle 25 000 tonnes, the share of the total amount is small, but our technique can be scaled up further. And this is a very important puzzle piece in order to make the textile industry more sustainable.

Circularity is at the top of the agenda for both brands and other operators in the textile value chain, but also for organizations and authorities. We have the European Green Deal and several similar commitments from countries all over the world. Many environmental NGOs state that circularity is a must for the textile industry.

The achievement so far is putting more than 600 tonnes of pulp on the market, and up to 20% of the raw material is recycled textiles. We have increased our capacity of production of OnceMore® pulp to a level of processing 300 tonnes of textile waste annually. The content of recycled textiles in the pulp has increased from 3% to 20% in just one year. The pulp is turned into viscose fibers and fabrics of good quality. We have also set up supply logistics for the textile waste and initiated contacts and partnerships with suppliers, customers, brands, authorities and NGOs all over Europe. The project crew of Södra is set to increase our capacity further and the goal is set for a processing capacity of 25 000 tonnes of recycled textiles in 2025.

With this innovation the amount of textile waste is reduced. The need for new textile fibres is also reduced. The environmental effect differs depending on which fibre is replaced with the recycled ones. If polyester is replaced, it has an effect on the climate (less use of fossil oil) and it decreases water pollution as polyester ends up as plastic particles in the oceans when clothes are washed. If viscose from wood is replaced, the wood is saved or put into better use. The range of possibilities to use wood for new things or replace items made from fossil oil, is wide. If cotton is replaced by recycled fibers, the land is freed up for agricultural use and food production and lots of water is saved, as cotton needs a lot of water to grow.

SDGS:





ENVIRONMENT VALUE CREATION

NATURAL RESOURCES AND BIODIVERSITY



ENVIRONMENT VALUE CREATION

NATURAL RESOURCES AND BIODIVERSITY



Lantmännen - ThermoSeed, The cleanest seed in the world!



Summary and Background Innovation - Intended purpose

ThermoSeed is a unique biological method for treating seeds to remove seed-borne infections. The method, developed by Lantmännen, reduces the need for pesticides within agriculture, benefiting the environment and promoting biodiversity as well as reducing costs for the farmer. The method has become widespread and has made a huge impact globally and will be crucial for farming of the future.

Environmental value creation - disruptive innovation minimizing the use of chemicals in the agricultural sector.

Lantmännen is a farmer cooperative and Northern Europe's leader in agriculture, machinery, bioenergy and food products. We are owned by 20,000 Swedish farmers, we have operations throughout the grain value chain, 10,000 employees in over 20 countries and an annual turnover of 5 billion EUR. For a long time, we have been investing up to 30 million EUR annually in

research and development and we have our own research foundation – working closely with our owners, the industry as well as academia. Our research efforts will play a key role in the transition to farming of the future – our vision and roadmap toward more sustainable farming by 2050. ThermoSeed, a unique innovation in the area of agricultural inputs, has been an important step toward reaching our vision.

ThermoSeed – The cleanest seed in the world!

ThermoSeed from Lantmännen Bioagri is a unique heat treatment method that produces healthy and viable seeds for conventional and organic cultivation. The process is a type of pasteurization that uses warm, moist air to neutralize the infection on and in the seed without compromising with the germination of the seeds. On the contrary, the germination process is stimulated, which produces stronger and more viable plants.

ThermoSeed treats seed-borne infections very effectively without the use of chemicals. Thanks to its high efficiency and the outstanding germination of treated seeds, ThermoSeed is able to compete with and surpass chemical seed treatments for most diseases in cereals. In addition, the method is effective on a large number of crops against fungi, nematodes and insect infestations in the seed. The farmer is therefore provided with the purest of seeds.

As seen in the two tables attached, the ThermoSeed method provides:

- a competitive alternative to chemical seed treatment in conventional agriculture
- a highly efficient solution against seedborne pathogens
- crop yield levels equivalent to chemical seed treatments
- outstanding vigor of germinating plants.

The innovation truly has improved farming conditions for both Lantmännen's owners, 20,000 Swedish farmers, and farmers globally, and has strengthened the competitiveness of the agricultural sector.

Our journey

ThermoSeed technology was initiated and developed by Kenneth Alness in collaboration with SLU, the Swedish University of Agricultural Sciences, during the 1990s, and as a result, a patent was filed, and a company formed in 1998 as part of Lantmännen.

Today, ThermoSeed has installed equipment for the method in Sweden, Norway, Finland, Switzerland, France, and do business in the USA and Japan. By

2020, ThermoSeed had been used on up to 1 million hectares of farmland, saving 2 million litres of pesticides, and the business continues to grow. In 2017, SLU proclaimed ThermoSeed one of the three most successful innovations that have originated from SLU's research since the university was founded 40 years ago. The motivation pointed out that "...With the great effect that the product has achieved in a relatively short lifetime, this is a good example of preventive environmental protection with global potential to reduce the use of chemicals in agriculture."

For more information: www.thermoseed.se and www.lantmannen.com.

ThermoSeed is a unique biological method that treats seeds to make them free from seed-borne infections. The method, developed by Lantmännen, reduces the need for pesticides within agriculture, benefiting the environment and promoting biodiversity as well as reducing costs for the farmer. The method has become widespread and has made a huge impact globally and will be crucial for farming of the future.

Lantmännen is a farmer cooperative and Northern Europe's leader in agriculture, machinery, bioenergy and food products. We are owned by 20,000 Swedish farmers, we have operations throughout the grain value chain, 10,000 employees in over 20 countries and an annual turnover of 5 billion EUR. For a long

time, we have been investing up to 30 million EUR annually in research and development and we have our own research foundation – working closely with our owners, the industry as well as academia. Our research efforts will play a key role in the transition to farming of the future – our vision and roadmap toward more sustainable farming by 2050. ThermoSeed, a unique innovation in the area of agricultural inputs, has been an important step toward reaching our vision.

Thermoseed – The cleanest seed in the world!

ThermoSeed from Lantmännen Bioagri is a unique heat treatment method that produces healthy and viable seeds for conventional and organic cultivation.

The process is a type of pasteurization that uses warm, moist air to neutralize the infection on and in the seed without compromising with the germination of the seeds. On the contrary, the germination process is stimulated, which produces stronger and more viable plants.

ThermoSeed treats seed-borne infections very effectively without the use of chemicals. Thanks to its high efficiency and the outstanding germination of treated seeds, ThermoSeed is able to compete with and surpass chemical seed treatments for most diseases in cereals. In addition, the method is effective on a large number of crops against fungi, nematodes and insect infestations in the seed. The farmer is therefore provided with the purest of seeds.

As seen in the two tables attached, the ThermoSeed method provides:

- a competitive alternative to chemical seed treatment in conventional agriculture
- a highly efficient solution against seedborne pathogens
- crop yield levels equivalent to chemical seed treatments
- outstanding vigor of germinating plants.

The innovation truly has improved farming conditions for both Lantmännen's owners, 20,000 Swedish farmers, and farmers globally, and has strengthened the competitiveness of the agricultural sector.

ThermoSeed technology was initiated and developed by Kenneth Alness in collaboration with SLU, the Swedish University of Agricultural Sciences, during the 1990s, and as a result, a patent was filed, and a company formed in 1998 as part of Lantmännen.

Today, ThermoSeed has installed equipment for the method in Sweden, Norway, Finland, Switzerland, France, and do business in the USA and Japan. By 2020, ThermoSeed had been used on up to 1 million hectares of farmland, saving 2 million litres of pesticides, and the business continues to grow. In 2017, SLU proclaimed ThermoSeed one of the three most successful innovations that have originated from SLU's research since the university was founded 40 years ago. The motivation pointed out that "...With the great effect that the product has achieved in a relatively short lifetime, this is a good example of preventive environmental protection with global potential to reduce the use of chemicals in agriculture."

The Innovation

ThermoSeed from Lantmännen Bioagri is a unique heat treatment method that produces healthy and viable seeds for conventional and organic cultivation. The process is a type of pasteurization that uses warm, moist air to neutralize the infection on and in the seed without compromising with the germination of the seeds. On the contrary, the germination process is stimulated, which produces stronger and more viable plants.

ThermoSeed treats seed-borne infections very effectively without the use of chemicals. Thanks to its high efficiency and the outstanding germination of treated seeds, ThermoSeed is able to compete with and surpass chemical seed treatments for most diseases in cereals. In addition, the method is effective on a large number of crops against fungi, nematodes and insect infestations in the seed. The farmer is therefore provided with the purest of seeds. The innovation truly has improved farming conditions for both Lantmännen's owners, 20,000 Swedish farmers, and farmers globally, and has strengthened the competitiveness of the agricultural sector.

ThermoSeed technology was initiated and developed by Kenneth Alness in collaboration with SLU, the Swedish University of Agricultural Sciences, during the 1990s, and as a result, a patent was filed, and a company formed in 1998 as part of Lantmännen.

Today, ThermoSeed has installed equipment for the method in Sweden, Norway, Finland, Switzerland, France, and do business in the USA and Japan. By 2020, ThermoSeed had been used on up to 1 million hectares of farmland, saving 2 million litres of pesticides, and the business continues to grow. In 2017, SLU proclaimed ThermoSeed one of the three most successful innovations that have originated from SLU's research since the university was founded 40 years ago. The motivation pointed out that "...With the great effect that the product has achieved in a relatively short lifetime, this is a good example of preventive environmental protection with global potential to reduce the use of chemicals in agriculture."

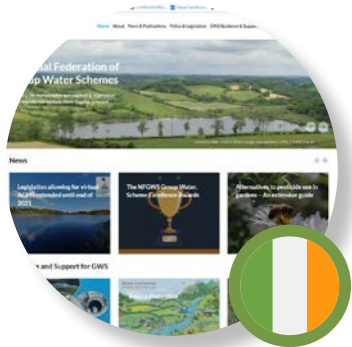
Value Creation

- a competitive alternative to chemical seed treatment in conventional agriculture
- a highly efficient solution against seedborne pathogens
- crop yield levels equivalent to chemical seed treatments
- outstanding vigor of germinating plants.

By 2020, ThermoSeed had been used on up to 1 million hectares of farmland, saving 2 million litres of pesticides.

SDGS:





National Federation of Group Water Schemes

Summary

The National Federation of Group Water Schemes is the representative organisation for the Irish community-owned group water scheme sector. Approximately 400 community-owned group water schemes with their own private source operating across rural Ireland, which provide potable drinking water to approximately 80,000 homes, farms and businesses. The vast majority of them are structured as co-operatives and are members of the NFGWS which is also a registered co-operative. In recent years, studies have shown that the condition of Irish water bodies has been in decline, with excess nutrients from land run-off, and pesticides leading to contamination. This not only has an adverse impact on aquatic life but also negatively affects raw (untreated) water quality on group water schemes, leaving the treatment process under increased pressure.

The NFGWS source protection pilot project, in counties Monaghan, Westmeath and Roscommon, have been developed to protect the health and well-being of our co-operative group water scheme members, through the protection of drinking water sources, while also having positive impact on biodiversity, sustainability and climate action.

Carefully planned and detailed, the project involves multiple stakeholders at every stage and thus ensures their commitment.

The project involves:

- The delineation of drinking water source catchments.
- Examination of raw water quality and impacting factors within the catchment.
- The creation of thorough frameworks and mitigation documents, aimed enhancing the quality of raw water within catchments.
- Working with farmers to reduce the negative impact of agriculture on water bodies.
- Raising awareness and educating the wider public about the importance of source protection and the impact of pesticides on both water and biodiversity.
- Social inclusion across the rural community.
- The promotion of water conservation and sustainability in the face of climate change.

The resources developed from this pilot project will be available to all group water schemes and to other agencies who are working on source protection measures, and will have a scientific basis. The implementation stage is well underway, with the mitigation measures currently being put in place.

To date, some of the standout results include:

- Nationwide catchment delineation for group water schemes.
- The publication of 'A Framework for Drinking Water Source Protection' and 'A Handbook of Source Protection and Mitigation Actions for Farming'.
- Farmers are beginning to embrace weed-wiping in efforts to reduce the use of pesticides.
- The 'Let It Bee' initiative in Co. Roscommon, has seen the provision of beehives to six farming families and has won the European Bee Award 2020.
- Various education and awareness initiatives have captured public imagination.
- Over 4,000 primary school children in Co. Roscommon are being given a tree to plant at home.
- Training materials and handbooks have been developed for group water scheme managers, educators, consulting engineers and scientists to help them implement source protection measures and pollinator plans.

Through our scientific approach to the project, the broad stakeholder engagement, the mixture of individual actions and accumulative measures, we believe that we have developed a model that can be replicated in rural communities across Europe.

Background Innovation - Intended purpose

In recent years, many drinking water sources have deteriorated in quality as a result of modern-day pressures from agriculture and other factors within rural communities. This has equally impacted on local biodiversity.

As the representative body for the group water scheme sector in Ireland, the National Federation of Group Water Schemes (NFGWS) devised a drinking water source protection pilot project, which is taking place across counties Roscommon, Westmeath and Monaghan, in an effort to reverse the impact that farming and communities are having on water supplies. The project aims to work with rural communities and relies on a scientifically based framework to ensure that appropriate measures are targeted in areas that need them most.

As per the ethos of a co-operative movement, everyone has a role to play. The project also aims to create awareness and understanding among the wider public, and places significant emphasis on education and inclusion.



“This project links protection of water, biodiversity and climate action with the health and well-being of communities across rural Ireland.”

Three main drivers are seen as integral to the project’s success:

- The involvement of the farming community
- The education of school children and their families
- Social inclusion

The success of the project can also be assessed through the analysis of key water quality parameters that are scientifically tracked.

The Innovation

This submission focusses on the implementation stage of the project. However there was significant planning to get to this stage. Individual catchments across the country have been delineated, and a framework for the protection of drinking water catchments has been developed. At all stages of the project, government and non-government bodies have been involved in the project steering group.

The project is being co-ordinated and managed by the National Federation of Group Water Schemes Society Limited, which is a registered co-operative. It is being driven by the voluntary group water scheme co-operatives, with the support of their local authority, who are working closely with people working and living in their local communities.

The outcomes of the project are being measured scientifically, through raw water monitoring and biodiversity studies.

The planning stage of the project involved the creation of a scientifically based source protection framework, source protection plans, a manual for farming mitigation measures, and initiative ideas for how rural communities could be encouraged to become involved in the project.

It was important that all actions have a scientific basis and relate to the three drivers mentioned in the previous section of this application.

“The involvement of the farming community”

In terms of the importance of local farmers, aspects of this project include:

- Working with farmers to put in place water source protection measures, such as riparian zones, which include wild meadows, hedgerows or woodlands.
- Farmers along stretches of water courses are erecting fences and riparian areas to prevent livestock access and nutrient run-off.
- Working with the farming community to reduce the use of pesticides through a voluntary weed-wiping initiative.

All of these measures are designed to limit the contamination of water sources but also have the added benefit of biodiversity enhancement. As part of the overall project, our award-winning 'Let it Bee' initiative (see attached video) links biodiversity, water quality and climate action, while also helping to raise awareness among farmers of the importance of drinking water source protection.

The initiative involves enabling a select number of farmers to become beekeepers, providing them with honey bees, hives, suits, and the necessary equipment, as well as training and mentoring. It encourages them to act as ambassadors for biodiversity enhancement and educate their community on the dangers of pesticides. Farmers like to farm — to produce a product. If they look after the bees by providing habitat, they can cut back on the use of pesticides and it will therefore help to improve raw water quality.

The 'Let It Bee' farmers' efforts can have an impact on drinking water sources, as shown in the image on page six in our attached document, which is an example of one of our catchments.

“Social inclusion & the education of school children and their families”

As part of the 'Let it Bee' initiative an organisation catering for people with mental health needs are making simple 'bee hotels' to be distributed to members of the community to promote awareness of other pollinators, and native bees.

The bee hotels are being distributed to 350 families and 29 school children. The workshop manager has stated that the project is highlighting mental health as something we need to talk about, and that the project will bring positive impact to those taking part.

One of our objectives has been the education of the wider community on the damage that pesticides can do in their domestic gardens. This is an important part of the overall project and is also linked to the 'Let it Bee' initiative.

It is essential that the project took an inclusive approach, and when we initially spoke to farmers, they felt they were being blamed for all problems in rural Ireland. This project reassures farmers that they are not being isolated and educates the whole community.

A huge component of this is our 'I've planted a tree and my garden is pesticide-free' campaign. All primary school children (ages 5-12) in County Roscommon will receive an online education programme and the children will be given a native Irish woodland tree (8,500 trees in total) to plant at home, along with certificates of involvement and educational resources.

The campaign seeks to not only educate children but also their parents with regard to the importance of source water quality and biodiversity, and what they can do at home to improve both.

Adults are also being made more aware through information materials that have been circulated in local media and erected at key locations, such as local livestock marts in Roscommon, Elphin and Castlerea. The materials detail practices that can impact on water quality, both positively and negatively.

Finally, water conservation is also an important aspect of the overall project. The installation of a number of water stations in key locations in local communities reduces the need for single use plastics. Decorated with information, the stations are also fantastic for providing more education on source protection.

A group water scheme in Roscommon has also provided children in local schools with reusable drinking bottles, thus educating them on sustainability and the negative impacts that single use plastics can have in our environment.

Value Creation

These are the results to date on our pilot project. The overall aim of the pilot is to trial initiatives that we can scale to multiple schemes in multiple locations.

- 1) Catchments on group water schemes across the country have been delineated. A framework for surface water and ground water source protection has been developed. Individual source protection plans have been developed for pilot sites in Roscommon and Monaghan.
- 2) A handbook, detailing 36 possible measures to protect water sources on farms has been developed, titled 'A Handbook of Source Protection and Mitigation Actions for Farming.' These documents have a scientific background and the aim is to protect the drinking water sources that are essential to the health, well-being and economic viability for many parts of rural Ireland.
- 3) The water quality data and conclusions drawn from the source protection pilot project has informed the basis for the roll-out of integrated source protection planning across the GWS sector.
- 4) On the Stranooden GWS in Co. Monaghan, a weed-wiping service (using glyphosate) as an alternative to MCPA has been offered to landowners,

in an effort to reduce the concentrations of the acid herbicide in the source lake. To date, 70 farmers have availed of the service. The GWS will continue to monitor the MCPA concentrations within the catchment's waterbodies over the coming year, in order to determine the effectiveness of the approach. No elevation in glyphosate concentration as a consequence of the weed-wiping activities has been recorded, thus ensuring that the process is not having any undesirable consequences.

- 5) As part of the 'Let It Bee' initiative, six farming families on two group water schemes in Roscommon were given bee hives. Two more on the same schemes are signed up for next year. The project is also being rolled out in the neighbouring County Mayo early next year, where six hives will be given to the farming community. The farmers have discussed the issues of pesticides locally, in local newspapers and on local radio. Three of the farmers have also put in place fencing along rivers and riparian buffer zones to capture nutrients and to act as habitat and food sources for their bees, local pollinators and other wildlife. They have also actively encouraged five other farming families to put up fencing and riparian zones. A video of this has also been distributed on social media.
- 6) Three local workshops that cater for people with mental health needs have signed up to manufacture bee hotels for pollinators. These will be distributed to farming and non-farming co-operative members as a means of highlighting the overall project.
- 7) The 'I've planted a tree and my garden is pesticide free' programme has been developed and trialled in two schools. On foot of the trial, the initiative has been rolled out on a county basis to 88 out of 91 schools in Co. Roscommon. The project is also being rolled out in a catchment in a neighbouring county. The initiative received national and local print media coverage and a video of the initiative was shared on social media.
- 8) The Source Protection Pilot Project in Co. Roscommon was declared the winner of the European Landowners' Organisation's 'European Bee Award 2020', for the 'Let it Bee' initiative, in the category "Land Management Practices." The president of the award's jury, Dr Michael Garratt, commented: 'The European Bee Award panel was really impressed with the diversity of activities the project has undertaken and that it looks to support not only wild pollinators and managed bees, but also deliver wider biodiversity and water quality benefits too.'
- 9) An outside radio broadcast took place in County Roscommon to highlight the impact that farmers can have in water catchments. Leaflets were developed, highlighting good and poor farming practices that have impacts on water quality and biodiversity in catchments. The project was discussed on local radio and leaflets were distributed through the schemes and in local print media.
- 10) Drinking water stations have been installed and are being trialled in two local communities. This part of the initiative is aimed at reducing single use plastics and making water readily available in locations that are key community focal points.
- 11) Following on from the installation of water stations, reusable drinking bottles have been distributed to three local schools.
- 12) Training materials and handbooks have been developed for group water scheme managers, educators, consulting engineers and scientists to help them implement source protection measures and pollinator plans.
- 13) The source protection pilot project is providing valuable findings when it comes to efforts to tackle water quality and biodiversity issues on a national and European level.

SDGS:





Stylis Olive Producers Cooperative

Summary

This specific innovation is a European co-funded programme in accordance with subparagraph (c) point (i) “improving irrigation systems and cultivation techniques” of the Commission Delegated Regulation 611/2014, which aims to determine the irrigation needs of the olive groves and replace of all the previous irrigation systems of each producer, in order to: 1) avoid over-irrigation phenomena, 2) protect the environment and 3) achieve sustainable management of land water resources.

The first implementation of Stylis Olive Producers Cooperative innovation programme started in 2015 for 3 years, and it is still being applied today, in the 3rd period 2020 - 2021 of its implementation. Especially in 2015-2018, 63 producers replaced 373,200 meters of irrigation spraying tubes with dripping tubes, and in the last 2 years 60 producers replaced 110,400 m with drip tubes and 32,400 km of water supply pipes. All of these drip tubes are equivalent to 285 ha of farmland. The purpose of this activity is to

develop and implement a modern and rational irrigation system in order to provide accurate information on the quantity, frequency and timing of irrigation for specific farms of the olive growers, depending on the productive direction of olive growing and with the aim of gradually reducing the required water resources, in terms of irrigation, by 20% in three years. Stylis Olive Producers Cooperative is responsible for the organisation, training, supervision and control of the implementation of the system with technical consultants that are in constant contact with the producers.

The benefits of this scientifically proven irrigation strategy are:

- Economic benefits for the producers and environmental benefits for land and water resources, because water is saved due to the avoidance of over-irrigation.
- Minimisation of the leaching of nutrients with both an economic impact for the producers (stopping waste of fertilisers) and environmental impact (stopping contamination of the aquifer).
- Better control of soil moisture, with a known impact on the vigor and growth of trees.
- Avoidance of subordination, leading to reduced production with degraded quality.

Improvement of effectiveness

Better water management for the producers and the environment: Accurate information on the quantity, frequency and timing of irrigation with the aim of gradually reducing the required water resources, in terms of irrigation, by 20% in three years.

Crop quality and quantity during harvest season: Better harvest with higher percentage of nutrients and a satisfactory fruit size as well as higher production per hectare.

Stronger connection with the region: Fostering understanding among the local community, public institutions and other private companies regarding the importance and significance of the cooperative in protecting the aquatic environment and the need to continue such important actions.

Increasing the number of the cooperative members: Building trust with producers resulted in their signing up as members of the cooperative.

Increased Market Share: New segment of the market with a special focus on cultivation techniques based on environmental protection.

New shop with agricultural products: Further support for the producers of the cooperative with materials that are necessary to improve cultivation such as fertilisers and pesticides as well as complete support for new modernised agricultural techniques.

Satisfied Producers: The implementation of innovations like proper management of irrigation in the area’s olive groves strengthens the bond of trust between the cooperative and the producers.

Improvement of efficiency

Lower costs of irrigation: Efficient watering of olive trees leading to a 20% reduction in water combined with the hydro-fertilisation method.

Lower transportation cost for returning crops with problems: Reduced costs of returning olives to the producers because of problematic macroscopic quality characteristics.

Lower costs of quality-related aspects: Reduction in costs for monitoring the macroscopic characteristics of the quality of the olives.

Higher value added: Increased selling price of the products.

Background Innovation - Intended purpose

This specific innovation concerns the development of correct agricultural practices of olive cultivation based on environmental criteria adapted to the local weather conditions and the cultivation techniques of each producer, as well as the dissemination among olive growers of appropriate information regarding their crop and monitoring of their practical application according to the irrigation needs of the soils.

This is a European co-funded programme in accordance with subparagraph (c) point (i) “improving irrigation systems and cultivation techniques” of the Commission Delegated Regulation 611/2014, which has been implemented since 2015.

More precisely, it aims to determine the irrigation needs of the olive groves and to replace the previous irrigation systems of each producer, in order to:

- 1) avoid over-irrigation phenomena;
- 2) protect the environment;
- 3) achieve sustainable management of land water resources.

The Innovation

Stylis Olive Producer's Cooperative was founded in 1949 and is located in the industrial area of Lamia, Central Greece. Its commercial activities already began during its first years of operation, at the factory in the Stylida area.

As the years went by and expansion into foreign markets started (Italy, France, Netherlands, Belgium, Germany, Romania, USA, etc.), it became evident that a new and updated factory was necessary, and so the headquarters, warehouses and production areas were relocated to brand new, modern & well equipped facilities with high quality production standards. Over the last years it has become one of the most successful cooperatives in Greece with 750 registered members/producers. It operates in the area of production, packaging and exporting of table olives, offering its members the chance to market their quality products more competitively and also providing them with knowledge and services of high standards.

Konservolia is the main variety grown in the area of Fthiotida. It is a P.D.O. product. This variety yields table olives that are famous for their rich organoleptic characteristics. The temperate Mediterranean climate of the region, the ideal altitude of the cultivated land, the distance to the sea combined with an average annual temperature of 16.5 degrees Celsius help the trees of this variety to grow and ensure a balanced proportion of all those nutrients that make this variety unique and the quantity produced satisfactory.

Irrigation of this type of olives, when done correctly, has a positive effect on flowering and fruiting, while contributing to the reduction of the annual alternation of large and small crops and maintaining the olive content at satisfactory levels. Excessive irrigation, on the other hand, can cause significant problems such as weed growth, cause of diseases and salt accumulation (water irrigation with salty water) and, most importantly, leads to depletion of land water resources.

Stylis Olive Producers Cooperative innovation programme is based on the study and the calculation of the distribution of the active root system of plants and the available soil moisture before and after irrigation by maintaining a record of the practices and quantities of water used. This specific method allows growers to calculate the optimal irrigation dosage, which is defined as the amount of water that allows the wetting of most of the plant's root system and at the same time prevents the movement of water to lower levels of the soil away from the zone where it is needed.

The purpose of this activity is to develop and implement a modern and rational irrigation system in order to provide accurate information on the quantity, frequency and timing of irrigation for specific farms of the olive growers, depending on the productive direction of olive growing and with the aim of

gradually reducing the required water resources, in terms of irrigation, by 20% in three years. For this purpose, the cooperative is providing the producers with all the necessary technical instructions and 110,400 km of drip tubes, which is equivalent to 64.9 ha of farmland (10 meters of drip tube for each olive tree) and 32,400 km of water supply pipe, in order to replace the previous irrigation systems according to the instructions for the new ones. During the last period 2015-2018, the number of the producers that entered the programme was 63, with the total of irrigation tubes replaced with dripping lines at 373,200 meters.

The role and the actions of registered producers in the implementation of this modern and rational irrigation system are of vital importance, as they largely determine the success of the system. How well producers follow the instructions will have a major impact on the percentage of producers who achieve the required reduction of water resources by 20% in three years in terms of irrigation. In this phase, the role of the Styli Olive Producers Cooperative, which is responsible for the organisation, supervision and control of the implementation of the system by the producers, is important and primary. The technical consultants of the Cooperative should be in constant contact with the producers and in addition to controlling the implementation of the system, the producers should be constantly trained and advised by them.

“An innovation of the cooperative that contributed to the protection of the aquifer and the reduction of irrigation costs”

The benefits of implementing a data-driven and scientifically proven irrigation strategy are very important, more specifically:

1. Economic benefits for the producers and environmental benefits for land and water resources, because water is saved due to the avoidance of over-irrigation, which is the application of a high amount of water that is greater than the soil moisture retention capacity.
 2. Reduction of the leaching of nutrients: Overflowing leads to water leakage and significant loss of nutrients by transporting them to deeper layers of the root system (leaching). This has both an economic impact for the producers (due to wasted fertiliser) and an environmental impact (contamination of the aquifer).
 3. Better control of soil moisture, which creates favourable conditions for the growth of soil phytopathogens such as *Verticillium*, with a known impact on the vigour and growth of trees.
 4. Avoidance of subordination, which leads to production reduced in quantity and degraded in quality.
- The last 2 benefits of applying the irrigation system lead to better quality fruit for the cooperative, higher production quantities and better selling prices in foreign markets.

Value Creation

Improvement of effectiveness:

Better water management for the producers and the environment:

This innovation/activity provides accurate information on the quantity, frequency and timing of irrigation with the aim of gradually reducing the required water resources, in terms of irrigation, by 20% in three years.

Stronger connection with the region: This innovation of the cooperative fostered understanding among the local community regarding the importance of such initiatives as well as the importance and significance of the cooperative in protecting the aquatic environment and the need to continue such important actions. In addition, it strengthens the cooperative's position when interacting with public institutions and other private companies in the area.

Crop quality and quantity during harvest season: Correct water irrigation of olives has led to better harvests with better and higher percentages of

nutrients and a satisfactory fruit size. It also led to higher production per hectare.

Increasing the number of the cooperative members: This innovation has helped us build trust among producers who were not members of the agricultural cooperative which resulted in their registration.

Increased Market Share: Our producers' water management allowed us to approach a segment of the market with customers who pay special attention to cultivation techniques that focus on environmental protection.

New shop with agricultural products: The implementation of the new irrigation water management system has created the need to further support the producers of the cooperative with materials that are necessary to improve cultivation such as fertilisers and pesticides as well as complete support for new modernised agricultural techniques.

Satisfied Producers: The implementation of actions and innovations such as proper management of irrigation in the area's olive groves strengthens the bond of trust between the cooperative and the producers. It helps producers understand the way they operate and the responsibility they have towards the cooperative and the environment, while the cooperative becomes aware of the problems and concerns of its producer members and takes on an important role in solving many long-term problems, such as proper water management.

Improvement of efficiency:

Lower costs of irrigation: The producers who participated in the programme and replaced their irrigation tubes saved a lot of money due to the better and more efficient watering of their olive trees (20% water reduction). In addition, they combined this kind of irrigation method with the hydro-fertilisation method which led to better and more efficient results regarding the nutrition of the olive trees.

Lower transportation cost for returning crops with problems: The increase in the quality of the olive fruit also reduces the transport costs of returning the olives to the producers because they were problematic, in terms of their macroscopic quality characteristics.

Lower costs of quality-related aspects: One of the most important benefits of this innovation is that it has led to a reduction in the cost of monitoring the macroscopic characteristics of the quality of the olives during the harvest period. This is because we have reduced insect infestation of the fruit of the tree due to the concentration of irrigation moisture close to the ground.

Higher value added: Better quality led to an increased selling price of the product as well as the penetration of better markets with the willingness to pay more for an eco-friendly product.

SDGS:



The image features a teal background with abstract geometric patterns. On the left side, there is a vertical strip of repeating hexagonal shapes. The rest of the background is filled with larger, faint, interconnected circular and line-based patterns. A white horizontal bar is positioned across the middle of the image, containing the text 'SOCIAL VALUE CREATION' in a bold, teal, sans-serif font.

SOCIAL VALUE CREATION

SOCIAL VALUE CREATION



Mans - E.I. Xarxa Agrosocial, SCCL



Summary

MANS is a social initiative dedicated to the production, processing and packaging of organic fruit and vegetables, as well as their marketing through supermarket chains. The mission of MANS is twofold: to generate jobs for people with difficulties, especially young people at risk of social exclusion, and to accompany them socially and in their integration into the labour market; and to reinforce and promote organic farming of proximity, facilitating a channel for their marketing.

Its activity is focused on the Catalan area, with two agricultural production centres in Sant Fruitós de Bages and Palafolls, a packaging and logistics centre in Sant Vicenç dels Horts, and a packaging plant for nuts in Tarragona.

The cooperative is made up of three social entities: Fundació Catalunya La Pedrera, which promotes the project, the Fundació El Molí d'en Puigvert, dedicated to caring for people with mental disorders, and the Fundació Topromi of Tarragona, which helps

people with learning disabilities and who are at risk of social exclusion.

“As a social cooperative, we work mainly with young people who struggle to access the world of work, young people with few opportunities who come from risk environments and who, in many cases, have left school early”. They are young people from complex family environments, families with personal shortcomings or with few economic resources who receive follow-up from social services; and also young immigrants who lack a family network in the country and who, in many cases, have gone through juvenile institutions, looking for an opportunity not to fall into situations of marginalisation.

To increase production capacity, MANS currently has an agreement with 35 farmers who belong to its network of associated farmers, all of whom have organic certification and most of which are located in the metropolitan area of Barcelona (Baix Llobregat, Vallés, Maresme and Pla de Bages). Currently 66% of all products marketed are local (less than 300 km).

Product: Its main products are seasonal and local fruit and vegetables, packaged in an attractive and biodegradable format, and nuts. In addition, MANS has a range of prepared food and fruit juices to use up seasonal production surpluses. The MANS product can be found in the Bon Preu-Esclat, Condis, Carrefour and ALDI supermarkets under the brands MANS, ECOOO, AgroSocials or GutBio.

Social and environmental commitment: The work in the cooperative, complemented by training actions, facilitates the social and occupational integration of people at risk of social exclusion. This task is carried out in collaboration with different public and private resources in what makes up a true network. The associated farmers also benefit socially by providing them with a marketing channel, with production planning and transparent sales commitment, as this improves the viability of their farms.

MANS has developed the first biodegradable packaging for organic fruit and vegetables in supermarkets. It is one of the most sustainable packaging solutions at present for fresh products with a compostable tray and a net mesh made mainly of cotton. With this packaging, it is estimated that the use of more than 5 tonnes of plastic per year will be avoided. This packaging has received the WorldStar Packaging Awards, one of the most important in the world, and is recognised as the most innovative in the food category and in its packaging process.

An innovative project: Until now, social agriculture initiatives have mainly focused on therapeutic activity but have had limited economic impact and scalability, and have been heavily subsidised. The MANS initiative incorporates young people into a real and demanding work environment, and into a sector,

large-scale distribution, that is highly competitive. We encourage them to complete their training and accompany them on a tailor-made programme. We do this in collaboration with different public and private resources (town halls, social entities, companies) in what makes up a true network.

This project also puts a lot of emphasis on providing a commercial solution for the productions of the social entities that make up MANS and the producers associated with the initiative. In this respect, commercialisation is the economic driver of this initiative. MANS is oriented towards the large-scale distribution channel with the aim of generating the maximum volume of sales and, therefore, having the greatest impact on jobs.

In 2014, when the cooperative started its activity, the big supermarket chains started to introduce organic fruits and vegetables into their product offer in Spain. At that time, a commercial relationship (initially exclusive) with the Bon Preu chain began. Since then, we have expanded the number of clients, incorporating the Condis chain, Aldi and Carrefour.

Thanks to the entrepreneurial and innovative nature of the project, we have been recognised through receiving the Entrepreneurial Initiative in the 2019 Food of Spain Awards (Alimentos de España) organised by the Ministry of Agriculture, Fisheries and Food.

Background Innovation - Intended purpose

The MANS Social Cooperative is a project made up of different actors and has the following objectives:

1. To add value to ecological agriculture of proximity, as a sustainable productive model, and to the small family farmers based locally.
2. To train, accompany and integrate into the labour market people at risk of social exclusion (especially young people), through work experience within the MANS Cooperative.
3. To disseminate social agriculture as a good practice and a multifunctional activity. That is to say, that it simultaneously provides social and labour improvements for people at risk of exclusion or disability, and improves the environment, social cohesion and resources in the rural environment.
4. To guarantee that the products and the cooperative production system (e.g. packaging), in addition to a positive social impact, has the best possible environmental impact at all times.

The MANS innovation is a social initiative, the main objective of which is the creation and consolidation of jobs for people at risk of social exclusion, especially within the young population. The MANS product can be found in the Bon Preu-Esclat, Condis, Carrefour, ALDI supermarkets, and in online supermarkets under the brands MANS, ECOOO, AgroSocials or GutBio. Social and environmental commitment

The work in the cooperative, complemented by training actions, facilitates the social and occupational integration of people at risk of exclusion. This task is carried out in collaboration with different public and private resources in what makes up a true network. The associated farmers also benefit socially by providing them with a marketing channel, with production planning and transparent sales commitment, as this improves the viability of their farms.

MANS has developed the first biodegradable packaging for organic fruit and vegetables in supermarkets. It is one of the most sustainable packaging solutions at present for fresh products with a compostable tray and a net mesh made mainly of cotton. With this packaging, it is estimated that the use of more than 5 tonnes of plastic per year will be avoided. This packaging has received the WorldStar Packaging Awards, one of the most important in the world, an award that it entered after receiving the national Liderpack award. Through this WorldStar Packaging Award, it is recognised as the most innovative in the food category and in its packaging process.

When MANS began its activity, the supermarkets started with organic fruit and vegetables. The cooperative collaborated to bring this product to the public, offering an excellent quality-price ratio and all the guarantees. Its future involves collaborating with organic agriculture of proximity, consolidating the organic fresh product as a reference point in the large-scale distribution in Catalonia, developing more fourth range products, and increasing volumes to continue creating jobs for the most vulnerable groups in society.

Until now, social agriculture initiatives have mainly focused on therapeutic activity but have had limited economic impact and scalability, and have been heavily subsidised. The MANS initiative incorporates young people into a real and demanding work environment, and into a sector, large-scale distribution, that is highly competitive. We encourage them to complete their training and accompany them on a tailor-made programme. We do this in collaboration

with different public and private resources (town halls, social entities, companies) in what makes up a true network.

This project also puts a lot of emphasis on providing a commercial and sales outlet for the productions of the social entities that make up MANS and the producers associated with the initiative. In this respect, commercialisation is the economic driver of this initiative. MANS is oriented towards the large-scale distribution channel with the aim of generating the maximum volume of sales and, therefore, having the greatest impact on jobs.

In 2014, when the cooperative started its activity, the big supermarket chains started to introduce organic fruits and vegetables into their product offer. At that time, a commercial relationship (initially exclusive) with the Bon Preu chain began. Since then, we have expanded the number of clients, incorporating the Condis chain, Aldi and Carrefour. We market the following different brands: MANS (in Bonpreu), ECOOOO (in Condis), Agrosocials (Carrefour) and together with ALDI's own brand, Gutbio.

To increase production capacity, MANS currently has a network of associated farmers with agreements with 35 farmers with ecological certification, most of which are located in the metropolitan area of Barcelona (Baix Llobregat, Vallès, Maresme and Pla de Bages). Currently 66% of all products marketed are local (less than 300 km).

Value Creation

Since the beginning of the project, the social initiative and MANS products have been very well received and the project has grown. Its main achievements are as follows:

1. Developed a network of associated farmers, currently made up of 35 farmers, for whom we facilitate the commercialisation of their product. In this way, the initiative creates an impact by helping small farmers, because the cooperative believes in their value as custodians of the territory, the landscape and the agri-food heritage.
2. In 2019, the initiative consolidated jobs for 47 young people at risk of social exclusion and people with disabilities. We have succeeded in integrating nine young people into the labour market or reintegrating them into the educational circuit.
3. The initiative has managed to introduce proximity agriculture into large-scale distribution, maintaining affordable prices for our farmers.

The cooperative currently sells organic agricultural products in Bonpreu, Carrefour, Condis and Aldi supermarkets, in addition to other distribution channels.

4. Developed sustainable packaging, which won the WorldStar Packaging Awards, in the categories of food and its packaging process.

5. The cooperative had been recognised through receiving the Entrepreneurial Initiative in the 2019 Food of Spain Awards (Alimentos de España) organised by the Ministry of Agriculture, Fisheries and Food.

6. The project achieved full economic sufficiency. MANS cooperative fully integrated into in the market of organic food products and in five years has increased its turnover from €758,000 in 2015 to €2,771,047 in 2019.

“I am very excited when the cabbages from the Huertos de Sant Benet arrive. I participated in the sowing and now I prepare them to make the broths.”

Jonathan Cano - MANS worker who has worked in the soup and broth company ANETO

SDGs





FRS - National Co-Operative Farm Relief Services Ltd

Summary

Without Members Benefit Schemes (MBS), many farming families would not be protected in the event that an illness or accident should occur. MBS gives peace of mind that a farmer can focus on his/her recovery knowing that their farm is in safe hands.

Background Innovation - Intended purpose

The FRS Member Benefit Scheme (MBS) was designed by co-operative members and staff to protect farmers and farming families by offering subsidised skilled labour in the event that their family farming business were impacted by accident or sickness.

"It was only a phone call to FRS and they sorted it, I couldn't speak more highly of FRS and the cover, I was thrilled with it"

Tim Doody, Dairy Farmer, Co. Limerick

The Innovation

In 2013, the National Co-operative Farm Relief Services (FRS) embarked on offering a new and innovative form of protection to its farmer members. Based on farmer-member feedback delivered through our farmer board, it appeared that there was a significant gap in protection for farmers. This gap was threefold.

First of all, most insurance cover was financial in benefit only, so the farmer still needed to organise the help they needed in the event of an accident or illness. Sometimes this needed to be done by a family member while the farmer was incapacitated.

Secondly, nearly all cover was for accidents only and did not cover illness. Those that did cover illness had significant exclusions. Finally, most protection policies only covered periods of hospitalisation, not recuperation at home. The FRS Member Benefit Scheme (MBS) set about offering an affordable solution to all of these issues. Firstly, it is affordable at just €295 per annum. Secondly, FRS can supply a non-financial benefit - a skilled, vetted operator at short notice who will take care of the work that needs to be done on the farm.

Thirdly, both accident and sickness are covered with no exclusions on sickness benefit and finally the cover extends to recuperation at home for up to 12 weeks cover in total. The first week is excluded and the remaining weeks are covered at 75% up to a weekly maximum benefit of

€500. Over 1,200 farmers signed up to MBS in 2020 and over €1.2m has been paid out since the scheme began in 2013.

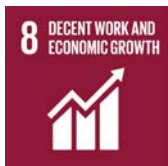
The annual MBS subscription also covers the co-ops' annual registration/membership fee and a 'Death and Capital Benefit' is also provided where up to €20,000 is paid out upon serious life-changing injury or death. As the overwhelming majority of farms in Ireland are owner-operated family farms, there is a

twofold effect if the farm owner cannot work. Firstly, their income is not protected if nobody is available to continue the operation of the farm in the event of injury or illness of the farmer. Secondly, there is the cost element of hiring a skilled replacement. The MBS delivers the greatest benefit of all, peace of mind, assuring farmers and farming families that their business is protected with one phone call to FRS in the event that an illness or accident should affect them.

Value Creation

Some €1.23 m has been paid out in benefit on approximately €2.05 m of invoiced services to farmers since the scheme's inception in 2013. This represents a 60.18% effective rate of subsidisation. This benefit was paid out to 405 farming beneficiaries who have relied on this innovative protection to ensure that their business could continue to operate effectively in the event of an accident or sickness of the main family farm operator.

SDGs





Spółdzielcza Mleczarnia Spomlek

Summary

One noticeable trend, not only in the European market, but also in Poland, is the increase in the quantity of milk, despite the decreasing number of farms. Between 2010 and 2020, the size of the cooperative has doubled and the company's revenues has tripled. This growth has enabled the development of our local farms, which have focused on high-volume milk production. In recent years, many of these farms have significantly increased their milk deliveries, thereby increasing their revenues and operating costs. Many have used subsidies and preferential loans to replace farm machinery or expand their outbuildings.

This resulted in an urgent need to stabilise farm revenues. As a response, the Fund for Stabilisation and Development was established in 2016, with the aim of stabilising the price of milk, as well as the effective economic development of the cooperative and improving the economic security of its members. The fund consists of milk price deductions, interest rates and profit write-offs. The amount resulting from deductions shall be registered in the farmer's and employee's individual account.

Background Innovation - Intended purpose

The most significant problems and challenges that the milk market in Poland and in Europe on the whole faces are first of all the unpredictability of this market, followed by the instability of dairy product prices, and finally the instability of raw material prices. Entities operating on the milk purchase market must meet the growing financial requirements of their suppliers. Therefore, there is a need to create an effective mechanism that stabilises milk prices in order to ensure financial liquidity of farms and, consequently, the continuity of raw material deliveries that cover the production needs of farms.

The unpredictability and instability of the market and major fluctuations in prices for dairy products prompted the Spomlek Cooperative Dairy to look for a mechanism that could stabilise farmers' income by influencing the milk price. In 2015, the Representative Assembly created the Stabilisation and Development Fund, which is innovative in Poland and even in Europe, as a mechanism to stabilise the price of milk and, consequently, the effective economic development of the cooperative and to increase the economic security of members. When the price for raw material is high, the cooperative, in a way, puts aside funds for the farmer on their individual account. When the price of milk is not able to cover the costs of production, the Stabilisation and Development Fund increases the income of farmers by subsidising the price of milk using funds accumulated on the farmer's account. The cooperative does not incur additional costs on this account.

The Innovation

The Stabilisation and Development Fund was created on the basis of regulations of Cooperative Law and the Statutes of Spomlek Dairy Cooperative in order allow for effective economic development of the cooperative and increase the economic security of members. It is created from deductions made from a share of the price received per one litre of milk in the case of members who are dairy cattle breeders and deductions from remuneration for work in the case of members who are cooperative employees. The number of deductions for the Stabilisation and Development Fund depends on the net value of milk delivered in the case of milk suppliers and net basic salary in the case of employees. The duration of deductions is determined by the management board after consultation with the supervisory board, taking into account the economic situation on the dairy market and of the cooperative.

The amount resulting from deductions is recorded on the individual account of each member of the cooperative. Funds accumulated in the Stabilisation and Development Fund constitute the cooperative's own capital and may be used, among other purposes, for payment of individual aid to individual members only if it is necessary to stabilise their economic situation disrupted as a result of unforeseen events, i.e. fire, flood, family members falling ill, etc. The amount of accumulated funds that can be withdrawn for the aforementioned unforeseen events is not limited, but cannot exceed the amount accumulated by the member on his/her individual account. The decision on the amount of payment is made by the management board after submitting a request for payment, taking into account the opinion of the supervisory board. The management board of the cooperative shall have the right to require

the member applying for withdrawal to prove the circumstances alleged as the basis for withdrawal of the accumulated funds. The disbursement made in accordance with the principles of these regulations shall reduce the balance of funds in the individual account of the cooperative member. If there is a crisis on the dairy market, the management board of the cooperative may decide to pay out the funds accumulated in the Stabilisation Fund. The duration of this additional payout and its amount shall be determined by the management board after consultation with the supervisory board, taking into account the economic situation on the dairy market and the economic situation of the cooperative. The total amount of individual additional payout may not exceed 70% of the amount accumulated in each member's individual account as of the date of the decision to launch the additional payout. If a member withdraws from the cooperative or there is a loss of membership in the cooperative under the provisions of the articles of association, the funds accumulated in the individual account of each member are subject to payment 30 days after the date of cessation of membership in the cooperative and no later than by the end of the calendar year following the date of loss of membership.

“The epidemic has shown that saving money is essential. These funds can be used in emergency situations. The fund is the cooperative’s best initiative.”

Adam Kulikowski, supplier.

In the event that a member's share in the cooperative is reassigned, all of the funds accumulated in the Stabilisation and Development Fund shall be transferred to the cooperative member to whom the member's share in the cooperative has been reassigned. Disbursement may only be made at the express written request of the cooperative member who is transferring membership shares in the cooperative.

In cases justified by the difficult financial situation of the cooperative, the assembly of representatives may adopt a resolution to suspend payments from the Stabilisation and Development Fund for a strictly defined period of time.

The fund was created because the instability of prices for milk is a huge problem for our suppliers and we have very limited influence on shaping current prices on the milk market. The idea behind this fund was very simple: let's create savings for hard times. When market prices for milk are high, we deduct a small part of the money we pay for milk from the fund. When market prices go down, we deduct less and vice versa. But when current market prices fall dramatically, we subsidise the price of milk from this fund.

All cooperatives have always deducted for the Share Fund, which builds the capital of the cooperative. SM Spomlek also deducts for the Share Fund, so the deductions themselves are not new. The problem is that cooperative law does not allow the money accumulated in the Share Fund to be used to stabilise the price for milk. A cooperative member can only get their money back after they cease to be a member of the

cooperative. The Stabilisation and Development Fund does not have this disadvantage. It is also important that the deduction does not go to one account owned by the cooperative, but to the individual accounts of farmers. Every month, farmers (on invoice) and employees receive information about how much they have accumulated in this account. The Stabilisation and Development Fund is also topped up with the cooperative's year-end profit.

The milk crisis does not directly affect the employee's salary. It mainly affects the price of milk and farmers, so for employees who are members of the cooperative, money can be paid out in emergency, unforeseen cases.

Given that we can subsidise the price of milk for farmers during the crisis, contributions to this fund are differentiated. Farmers contribute more, but they can also benefit more. The employee-members therefore put aside money for a good pension fund.

Value Creation

The Stabilisation and Development Fund is the cooperative's capital, which is used as actively as possible and to the cooperative members' benefit. It is worth mentioning that the funds in the Stabilisation and Development Fund are recorded in individual accounts. At the end of the day, we give back to the members every single zloty that goes into the fund account.

Amounts set aside for the fund represent a cost of the cooperative and thus reduce the profit as well as the tax paid by the cooperative when withdrawing money from the fund. There is no taxation and every zloty paid there will be paid without deduction.

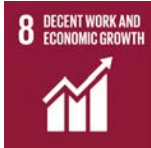
The money from the fund is used to provide assistance to members in emergency situations.

The recent milk price crisis has shown that the money collected in the fund could be used to subsidise milk when our members' farms were in a very difficult economic situation. Our cooperative is specific because we concentrate on cheese production. As a result, there are times in the market when we are not able to maintain a satisfactory price for raw materials for producers of, for instance, cheese or UHT milk. There are also times when we can pay above average. That is why we think that at times when the cooperative is falling behind with the price of milk compared to other dairies, we have an opportunity to mobilise resources using the Stabilisation and Development Fund and to subsidise the price of raw material, and in the time of cheese boom to add to this fund.

During the operation of the Stabilisation and Development Fund since January 2016, Spomlek Cooperative Dairy transferred PLN 25,670,059 from the price of milk to the individual accounts of its members. From August to December 2018, PLN 8,149,548 from the aforementioned fund were used to subsidise the price of milk.

In addition, this fund allowed for payouts in unforeseen situations to 166 members amounting to just under PLN 3 million.

SDGs:



SPONSOR



Cajamar Caja Rural is the leading credit cooperative bank in Spain with 1.4 million members and 3.5 million customers.

It has 962 branches and 5,486 employees. It is a member of the European Association of Cooperative Banks, being supervised by the ECB. Based on its size and volume of assets, it is one of the top 12 significant banking entities in the Spanish financial system. Cajamar Caja Rural is committed to the different productive sectors, pays particularly close attention to the agri-food sector and aims its financial activity at local economies, especially self-employed professionals, growers, stockbreeders and SMEs. At 30 September 2019, it had assets of 45,621 million euros, a managed turnover of 77,168 million euros, a solvency ratio of 14.83% and a CET1 phased in ratio of 13.14%. It is present in 43 provinces of Andalusia, Aragon, Asturias, the Balearic Islands, the Canary Islands, Cantabria, Castile-La Mancha, Castile and Leon, Catalonia, the Community of Valencia, Extremadura, Galicia, La Rioja, Madrid, Navarre and the Region of Murcia, as well as the autonomous cities of Ceuta and Melilla. Cajamar has two agricultural related experimental centers which carry out applied research and develop new production technologies, focusing on knowledge transfer and the dissemination of findings. This commitment to the culture of innovation is enhanced through training and economic analysis provided by the Department of Socio-Economic Analysis, the School of Cooperative Advisers and the Network of University Fellowships.

A key function that has been crucial to the uptake of digital technology is the Technical office, a specialized agronomic department, which analyzes different areas of the agrifood sector carrying out detailed economic and profitability analyses, allowing growers and SMEs to avoid risks in the adoption of new technologies and to increase their profits by implementing the best cost/benefit options. This is a key point in Cajamar's business model. For CAJAMAR, knowledge transfer is a critical aspect for innovation. In order to reach its wide range of stakeholders across many agricultural subsectors, Cajamar has targeted courses, seminars, conferences and visits coupled with an extensive catalog of free online publications such as knowledge transfer sheets, technical papers and scientific and technical articles that create a comprehensive information system which helps to improve the training of the main stakeholders. 9,000 subscribers, made up of farmers, advisors, policy-makers and companies, are regularly informed of activities and innovations.

In the last year it carried out nationally more than 150 knowledge transfer activities with more than 10,000 attendants and received more than 265 visits and 4,186 visitors from more than 40 countries.



cogeca

european agri-cooperatives

61, rue de Trèves
B - 1040 Brussels

Telephone 00 32 (0) 2 287 27 11
Telefax 00 32 (0) 2 287 27 00

mail@copa-cogeca.eu
www.copa-cogeca.eu



**5th EUROPEAN AWARD FOR
COOPERATIVE INNOVATION**

Cogeca is the voice of agri-cooperatives in the EU. Created in 1959, Cogeca represents the interests of 22.000 agricultural cooperatives who employ over 600.000 people. Cogeca aims to ensure that the EU agriculture and agri-food sector is sustainable, market-orientated, innovative and competitive so that agri-cooperatives can provide over half a billion people with quality food supplies at a reasonable prices. Cogeca provides a platform for its members to exchange their views and agree on a common position on upcoming issues affecting the EU agri-food sector and agri-cooperatives. Such positions are then communicated to the EU and international institutions and decision-makers to ensure that agri-cooperatives views are taken into account. Cogeca also carries out studies of particular interest for agricultural, forestry, fishing and agri-food cooperatives and promotes their role and business model in EU and worldwide.

Sponsored by:

