



## IO4.CONNECTION TO DAIRY INDUSTRY

### A2: ENTREPRENEURSHIP **CASE STUDIES** DEVELOPMENT

Innovative Dairy Science  
Education material development





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## 1. Introduction

### 1.1. Description of the project

The dairy industry is one of the most important components of the world food system, and is constantly undergoing changes. Currently processes of change are being driven by a wide range of forces including shifts to the regulatory environment for dairy production and trade, technological changes to the production of milk and dairy products, rapidly shifting consumption trends, and the restructuring of transnational corporate strategies. **InnoDairyEdu** comes as a result of the common need of Higher Education Institutes to provide up to date knowledge and skills in Dairy Science.

The main objective of **InnoDairyEdu** is to provide Food Scientists with the skills required by the labour market and the economy, while allowing them to play an active role in society and achieve personal fulfilment.

The general objectives of **InnoDairyEdu** are to promote European cooperation in education and training, to use innovative practices in education by the strategic use of Information and Communication Technologies (ICT) and open educational resources (OER), to create sustainable links between academia and the dairy industry and to assist the strategic development, quality and internationalisation of the participating Higher Education Institutions. More specifically, **InnoDairyEdu**:

1. Evaluate the training needs in Dairy Science in European Higher Education Organizations.
2. Develop innovative education training materials for EU Universities focusing on Products, Processes, Quality, Safety & Entrepreneurship of the Dairy Sector.
3. Digitalize the education material to be developed.
4. Use ICTs and OER to ensure wider accessibility to knowledge, by developing an interactive MOOC online platform with all the material produced to be uploaded.
5. Pilot test and evaluate the Dairy Science platform with all education material to be developed.
6. Translate part of the educational material at all the languages of the partnership (Greek, Italian, Spanish and Polish) and English in order to be wider accessible.
7. Create a sustainable link among academia and dairy industry, by using ICTs and OER emphasising on entrepreneurship issues.
8. Disseminate the project's results to the academia and the dairy industry.

## 1.2. General description of Intellectual Output 4

**InnoDairyEdu Intellectual Output 4 with the specific activities,** addresses the need of a closer interaction between the academia and industry or, in a larger perspective, the dairy business area and the dairy value chain. Educational and training approaches and methodologies for the young generation of food scientists and technologists require the implementation of adequate academia-research-job market interactions and their improvement in a wider societal framework. This will be achieved by bringing closer and discussing strengths and weaknesses, opportunities and threats that may form the new academia-dairy industry co-operation area.

The main output is the approach of all stakeholders and the dissemination of what each stakeholder can offer; i.e. the educational knowledge and technology produced by the academic organizations within the **InnoDairyEdu** project and valuable experience and "how-to-do" practice by the industry side.

**A specially designed forum** on the e-learning platform constitutes the basis for the know-how, technology and method exchanges and provides a continuous flow of knowledge and expertise between universities and industry partners to enhance professional and entrepreneurial skills. All participants can invite stakeholders to participate, share, discuss or just communicate the produced knowledge, pose questions and suggest ideas, policies and solutions.

During this process firms, students and academics can become parts of a significant network to boost innovation and entrepreneurial action all along the dairy value chain. Furthermore the participating students get valuable knowledge on the commercialization potential of their ideas or how to go about bringing their innovation to market. The forum provides opportunities for brokerage events and SME technology transfer programs which constitute key mechanisms for technology and knowledge transfer.

The second activity provides the implementation of a case study-based approach to dairy science education. All participating organizations have provided cases which are known as best practices in their region/country. Case studies focus on the business or commercial exploitation of lab findings, academia-industry collaborations, start-ups and spin-offs, internationalization, barriers and so on. Finally, the case studies have been uploaded on the e-learning platform in order to be available for teachers, students and professionals in dairy industry.

## 2. Case Studies

### 2.1. Pagonis sis. & Co

#### Company presentation

<b>Country / City</b>	Greece/ Erythres, Region of Attica
<b>Products</b>	Dairy products, Feta PDO, yogurts, deserts
<b>Legal form</b>	General partnership
<b>Year of foundation</b>	1978
<b>Number of employees</b>	15
<b>Market (target customers)</b>	RETAIL, WHOLESALERS, HORECA (Families, consumers with no age borders, people who care for a balanced Mediterranean diet, tradition lovers)
<b>Exports (% of turnover)</b>	18%
<b>Main competitors</b>	Other SME dairy companies
<b>Turnover (optional)</b>	1.8 million euro
<b>Type of company (start-up, spin-off, established) at the time of the innovation</b>	Established <a href="http://www.pagonis-dairy.gr/en/">http://www.pagonis-dairy.gr/en/</a>
<b>If a startup – education and work history of the entrepreneurial team</b>	

#### 1) Brief description of the sector and the sub-sector in the country

Cheese making in Greece, is a traditional business sector, since cheese production is mentioned in many historical sources as one of the most basic industrial occupation. As time passes, and with the contribution of financial institutions, as well as the investment motivation that has been given from the State, the sector has shown a significant development with a simultaneous increase of the industrialization grade, that makes it a dynamic factor of the dairy industry and the food industry generally.

A main characteristic of the sector is the large number of industries that are activated in it, in a productive role.

Large volume enterprises cover a significant part of the internal market. They are companies that have a wide product range and new equipment, which they



constantly renew, giving significant funds. Moreover, through the well-organized and wide distribution network that they own, they have managed to cover the biggest part of the Hellenic territory, while most of them have developed a significant export activity.

However, the majority of the enterprises include small size enterprises that have a limited production capacity, meaning small businesses and farms, with similar characteristics. Those businesses, act usually locally, producing traditional products.

## 2) Short description of the case

PAGONIS Company is found among the small business of the dairy sector, established in the village of Erythres of Attica region, in Kithaironas Mountain and counts more than half a century of activity in the dairy sector.

Main activity of PAGONIS is the production of cheeses, mostly of sheep and goat milk and less from cow milk, as well as the production of traditional milky products.

The raw material is 100% Greek and it is collected on a daily basis from farms that are found in a distance of less than 1.5-hour time from the dairy. The farmers (50 in total) are colleagues for years, and they are harmonized with the EU legislation, following every rule regarding the vaccination and the handling of their livestock.

All the necessary analyses are carried out in the approved Quality control laboratory that PAGONIS has got in its establishments. Analyses include physicochemical, microbiological test, as well as test for inhibitory substances.

The personnel (15 in total) is permanent and specialized, and consists of a Food Scientist –MSc, a Biologist-MSc, a Food technologist, 2 Food technicians (graduated from a Technical School and Sivitanidios School, which is a department of Food Technology) and specialized dairy technicians that work in the company for ten or more years. Moreover, the Sales and Marketing department runs under the responsibility of an Economist – MSc, with a long-time experience in the field. All those specializations are framed from the long experience of the company's founders, resulting the overcoming of any difficulties that come out throughout time.

Furthermore, PAGONIS participates in research proposals, in collaboration with Universities from Greece and abroad, since 2013. Particularly, the following research proposals have been submitted:

- 2013: **“7<sup>th</sup> Framework Programme for Research, technological development an demonstration”**, with the title **“Integrated resource- efficient processes for safe food manufacturing”**, in collaboration with 13 other colleagues from Greece and abroad (Universities and companies).

- 2017: **Cycle A “Research-Create-Innovate”**, in collaboration with A.U.A, Department of Food Science A.U.TH, N.H.R.F, with the title: **“Omics technology and nanotechnology as tools for the development of innovative functional products from autochthonous Greek sheep and goat breeds”**.
- 2017: **General Secretary of Research and Development**, in collaboration with A.U.A, in the **Greece- Germany Frame collaboration**, with the title: **“Assessment of microbiological quality and safety of goat Milk – Definition of Quality standards for goat milk processing”**.
- 2018: **HORIZON 2020**, in collaboration with 40 other partners. (From Greece, A.U.A and three companies, one of which PAGONIS, and the rest 36 almost from the whole Europe, Universities and companies), with the title **“ Minimal processing technologies for Fresh , Sustainable and healthy dairy, fruit and vegetable food in local supply chains”**
- 2019: **General Research of Research and Development**, in collaboration with A.U.A, in the **Greece-China Frame collaboration** with the title **“The indigenous microbiota of raw goat and camel milk, as a source of functional starter cultures for the development of novel functional dairy products”**.
- 2019: **Cycle B Research – Create- Innovate**, in collaboration with A.U.A, Department of Food Science A.U.TH, N.H.R.F, and Aegean University, with the title **“Omics technology and nanotechnology as tools for the development of innovative functional products from autochthonous Greek sheep and goat breeds”**.
- 2019: in collaboration with **B.R.F.A.A**, **“Assessment of the Physicochemical and Microbiological characteristics of the wooden barrel of Feta cheese PDO, throughout its maturation”**.
- 2019: (publication for judgment in the International Journal of Production Research), in collaboration with University of Piraeus, Department of Industrial Management and Technology, with the title: **“Block Chain Based Food Supply Chain traceability: a case study in the dairy sector”**.

Moreover, PAGONIS Company has been approved for funding of its productive and commercial activities, from the national funding program “Tools for competitiveness of small and very small businesses”.

Following the trend of small family businesses, there is a wide product range, in fast moving consumer good, as well as in specialized products such as gourmet products, and light cheeses.

The products are sold through:



- Owned vehicles (direct sale in retail stores)
- Company's retail store
- Wholesalers
- Commercial companies that buy the products on a Private label branding
- Exports

Since 2017, after collaboration with large commercial companies, PAGONIS products are found in the most well-known retail stores in Greece, such as Sklaventitis, AB Vasilopoulos, My Market, Galaxias, and other smaller retail chains.

Additionally, after 2009, PAGONIS Company searched for new ways to overcome the deep financial crisis that stroke Greece. Thus, eventually, and after organized approach of abroad markets, PAGONIS managed to bring a 18% of its annual turnover from exports, not only in Europe, but in Asia and Africa too. Particularly, PAGONIS products are found in Italy, Austria, Germany, United Kingdom, Cyprus, Spain, France, Dubai, S. Korea, Japan and Republic of Congo.

PAGONIS products have been awarded for their superior quality, in national and international contests, such as World Cheese Awards, gaining Silver and Bronze medals, and in the Dairy Exhibition Cheese Contest, gaining Golden and Silver medals.

The Quality Control System of the company is certified by ISO 22000:2005 and with FSSC. The priority of PAGONIS Company is the production of safe, and higher quality products, and the appliance of technologies that respect the nature and the consumer's health, revealing always the richness of the Greek tradition.

### **The idea: New product - Pagonis light sheep milk cheese (2% - 1%)**

#### **New R&D product (innovation at national level)**

#### **3) Origins / The innovation:**

Pagonis light sheep milk 2% was a product of the company's **R&D portfolio** in 2010. It started as a product of curiosity and a mood of experimentalism, since the question of light sheep milk lower than 8-9% emerged in the mind of the entrepreneur as a potential attractive product for certain market groups. Therefore, it was a **research-driven** (and NOT a market-driven product).

The product was internally developed by the scientific staff of the NPD department of the company with experiments at low production scale. It took around 4 years to be dynamically introduced in the market. **Many trials were tried**, texture – improving oriented, by several means such as the usage of additives, natural or artificial, milk derivatives or not, and most of them gave a sandy effect, foreign to the initial real

texture of the product. **One of the major restrictions** was for the product to be called “Sheep milk oriented”. Thus, the company’s interest was mostly focused in the changes of specific parameters of the procedure (time, temperatures, steps sequencing).

A simple skimming of milk led to a white cheese in brine, which, despite its hard texture, began to gain a constantly growing consumer group. The new cheese was **the only one in the Greek market with such a low-fat content** and a high protein level, that it could perfectly fit to those that were following low fat –high protein diet, such as Dukan diet.

The main research interest of the product is hidden in its **production procedure**. However, sometimes, improvements of the product were rather accidental (e.g. by mistake-movements), which is quite common in the dairy industry. Actually, **the standardization of the procedure came months after the large-scale production** of Pagonis light sheep milk cheese.

The company did not calculate R&D expenses.

The company did not request any IPRs.

**Raising academic research interest:** Pagonis light sheep milk cheese 2% , apart from the company’s internal research contacted within the company’s factory and the numerous experiments , has also been an issue of major studies with research institutes in Greece, such as Agricultural University of Athens, National Hellenic Research Foundation (<http://dspace.aua.gr/xmlui/handle/10329/6941?fbclid=IwAR2jfw2t41SCGhpyr4oQ1WE1bBPDOvXWCEOsMg4csio1C6mO-3yYG9cOs>), and most recently Sector of Food Science and Technology, department of Agriculture, Aristotle University of Thessaloniki (AUTH) and the University of Thessaly.

As far as the collaboration with AUTH is concerned, the experiments are still running during all 2020, and they will actually form a whole observance of the behavior of light sheep milk cheese, during its maturation. The results are expected to be very lightening.

#### 4) Business – plan

**Key partners:** Packaging was taken over by the main channel Freevia.

**Key Activities:** Internal R&D, try-and-error processes, pilot production, production line adjustments, mass production

**Key Resources:** raw material by a number of sheep milk suppliers, and additives, natural or artificial. For the production of Pagonis light sheep milk cheese, no equipment was bought and no investment in terms of machines was made. What was

actually involved deeply, as an investment, was the understanding of the procedure of how light sheep milk cheeses mature and behave by time.

**Value Proposition:** “Pagonis light feta” – A quite strong value motto for the feta lovers who are not allowed to enjoy full fat dairy products. *(Although, legally, that product could not be called “feta” in any version, but social media and the market make their own rules, and this can be considered a success for the product and a best practice in general).*

**Customer Segments:** retail and the big super markets are the main markets. The product addresses mainly consumers with any type of restriction to full fat feta cheese but it seems that it is bought by all types of consumers no matter age, sex or other categorization.

**Customers and customer Relations:** The new product started to be communicated among different age groups with a really high expansion velocity. The social media were re-producing “Pagonis light feta”, although, legally, that product could not be called “feta” in any version.

**Since this product was unique and innovative in its category, it soon attracted the interest of large commercial companies, who placed it in the retail and the big super markets.**

**Channels:** One of the key channels that led to the establishment of the product in the Greek market, was the collaboration with the company Orizontes S.A (<https://orizontes.com.gr/>). Orizontes, made their own brand “Freevia 1%, (<https://orizontes.com.gr/freevia/>) as a diversion of Pagonis light sheep milk cheese 2%, penetrating this way to most of the Greek retail channels.

<https://www.freevia.gr/freevia-1-%ce%bb%ce%b9%cf%80%ce%b1%cf%81%ce%ac-360gr-%ce%b1%cf%80%ce%b1%cf%87%ce%bf-%cf%80%cf%81%cf%8c%ce%b2%ce%b5%ce%b9%ce%bf-%cf%83%cf%85%ce%bd%ce%b5%cf%81%ce%b3%ce%ac%cf%84%ce%b5%cf%82/>

Actually, Orizontes penetrated that intensively to large retail stores, that almost 90% of light sheep milk cheese is packed in Freevia 1% bowls. The agreement with Orizontes, was that they pay for all packaging materials that are involved in the preparation of the product: plastic bowls, carton boxes. The cheese is packed, palletized, loaded to the company’s vehicles, and is either sent with a transportation company in Thessaloniki (and from there to Lakkoma where Orizontes have their establishments), or sent to a transportation company that delivers to central stores in Attika supermarkets, or to central stores in Attika supermarkets, ordered by Orizontes. Details are described in the agreement that Pagonis & Orizontes have signed.

**Cost Structure:** Raw material and work hours were not given as money; however, it was mentioned that R&D and pilot production absorbed a considerable amount of raw material and working hours.

**Market analysis:** As mentioned above, Pagonis sheep milk cheese 2% is an innovative and unique product at least at national level and among the few worldwide. It is a category on its own, but if needed to be placed under a wider umbrella, it would be placed under the general category of "light dairy products". **Its unique innovative characteristic, compared to those products, is its very low-fat content.** Thus, when others similar products, have a fat content of 9-11%, Pagonis has only 1 or 2% (depending on under which brand it is sold). **In this sense, the only serious competitor of Pagonis 2%, could be Freevia 1% but both of them are produced in Pagonis factory. Lately, Zemitha by Epirus (only grated) appeared also in the market** (<https://www.epiros.gr/product/zemytha-1-lipara/>).

Alternative products which could be considered as competitors are other types of light dairy products or even relevant vegan products, but all these are not direct competitors.

**In 2019 the Freevia 1% cheese, won a silver medal on Healthy diet awards!!!**



### Market trends, evaluation of the potential market

Low-fat cheeses are becoming more popular among consumers no matter due to health / diet reasons or just to enjoy the same taste with lower calories. On the other side, recently, more and more companies offer low-fat cheeses due to technological developments and improvements in production. A light type of "feta" is an attractive product for Greeks who want to enjoy the taste of feta but who do not want to consume many calories. Therefore, there is an increasing demand for such products, while it is expected that the trend will soon reach other countries where people have tried and loved feta.

### SWOT ANALYSIS

#### Strengths

1. Low fat

2. High protein
3. Balanced diet
4. Can replace feta cheese, the most well-known cheese that is widely consumed in Greece
5. Unique in its category - innovative
6. Sensible end price
7. Easy for the consumer to find it all over Greece

### ***Weaknesses***

1. Hard and it takes a short time for the consumer to affiliate with the idea that it is not as full as feta in texture.

### ***Opportunities***

1. The emerging trend for light dairy products
2. The collaboration with freevia

### ***Threats***

3. The fragile and vulnerable socio-economic environment in Greece
4. The low barriers for the product to be reproduced by other companies

### **MARKETING MIX**

**Place:** as it can be seen from the link "Selling points" in Freevia site, it has been placed in most of the super markets, but there is space enough for developing

**Price:** sensible

**Product:** unique, innovative, fitting perfectly to a low fat diet

**Communication - Promotion:** Orizontes Company, run every promotion activity that is bind to the product "Freevia 1%". Social media (facebook, instagram, freevia site) sensory trials, live promotion in the super markets with personnel hired for that purpose, famous chefs creating recipes with Freevia 1%, beautiful photos where actually Freevia replaces feta cheese PDO in Greek salads etc.

**Distribution** has been described above.

### **Product design:**

The flow chart of Pagonis light sheep milk is private. According to a general description, milk is :

- collected,

- filtered,
- skimmed,
- pasteurized
- cooled
- inoculated with starter cultures
- rennet and other additional dairy material is added
- allowed to coagulate
- cut
- put in molds to drain
- cheese matures in controlled temperature / humidity stores
- put in refrigerator
- sold in 2 different packages (360 gr and 4 kilos, but 4 kilos is not so interesting because it is up to the bench seller to propose it or not to the customer, but 360 gr is a self-served product, which the customer will buy).

#### **Quality control of Pagonis light sheep milk cheese includes:**

- ph measurement of milk during its arrival (usage of a common phmeter).
- Control of antibiotics presence in milk (rapid method with sticks deeped in a substrate that can identify the presence of b-lactams and tetracyclines), or method of reference (Eclipse ) that demonstrates the ability of the milk to control of fat measurement after skimming (usage of a milk analyzer, or a Gerber method).
- Control of pasteurization (electronic temperature recording loggers, and alkaline phosphatase test).
- Ph measurement during maturation.
- Control of the saltiness of brine added.
- Final product: **Physicochemical parameters:** ph, moisture content, fat content, salt content. **Microbiological parameters:** coliforms enumeration, Staphylococcus aureus enumeration, detection of Salmonella & Listeria. Control of all packaging equipment that it is used, control of correct marking (day of production, best before, lot number).

#### **Production process. Restrictions of the product development.**

**The production process is described above.**

- The **low fat of the milk, on its own is a restriction, in terms of mouth feel.**



- Moreover, the fact that the cheese is produced from a 100% sheep milk has given a **unique identity** to the product which has to be kept and not mixed with other kind of milk.
- The fact that it is generally consumed from people that care for their diet and what they include in their daily program, directs in a demand of a **clean label, with no additives, no “E”s**, that could possibly function as texture improvers.

## 5) Financial data – financing, types of funding

Own capitals. No funding has been made for this product

### The story so far

#### *The difficulty of classifying and authenticated innovative foods*

As there was no similar product on the market, light sheep's yogurt attracted many times the interested of control mechanisms, which is very common with innovative food products, since the Food and Drink Code is outdated with significant gaps. So, sometimes the General Chemistry of the State and sometimes EFET (Hellenic Food Authority) or even private chemists, would try to investigate this innovative light sheep cheese (never seen or tasted before).

Thus, since a product to qualify as FETA CHEESE must have at least 11% fat, the light sheep cheeses by Pagonis could not be classified as cheese, although following the production of cheese! Eventually, the product was classified in the dairy category. The issue, of course, was more complicated than just its classification: how to call dairy a product that has cheese ingredients in it?

No one among the responsible organizations or even individuals could take a specific position. But the company went on to prove the innovative cheese. The effort to improve its quality characteristics has begun mainly over the last two years and continues. As no one can prove a complete and thorough result, the innovative cheese with its very special behavior has been studied in the Department of Food Science and Nutrition of the Department of Agriculture of the University of Athens. According to Prof . Alexandra Michaelidou, this cheese doesn't mature. This is shown essentially by the level of proteins detected in cheese at various stages of its life. The results of this study are expected from the University and will be published in a scientific journal.

The innovative cheese is constantly improving from the time that it was firstly produced and introduced into the Greek market (see the whole story above). As it is placed widely in the Greek market, mostly with the brand name “Freevia 1%”, the demands of the customers grow together with the commitment of the company to improve every parameter that is connected to it. **The number is constantly rising,**

not only because of the frequency that the consumer is buying it, but because of its penetration to the market and the continuous placing.

**According to the existing data, it will soon overpass the borders of Greece.**

Freevia 1% gives a 12% of the annual turnover of the company

## **6) Keywords, main training competences and skills**

### **Keywords:**

Dairy, cheese, light cheese, low-fat, New product development, internal R&D, try-and-error process, product and process innovation, target market, research-driven, market-driven

### **Main training competences:**

The case study outlines the business canvas of the real Pagonis light sheep milk cheese (2% - 1%) or according to the trademark "Freevia 1%" project.

### **Training objectives:**

- To understand the joy of creativity, of detecting opportunities and creating solutions
- To realize the importance of innovation and the need of specific capabilities
- To organize market opportunities into business plans
- To build a mindset of networking, collaborating and division of tasks
- To highlight the importance and the role of university (and other) partners
- To consider the important role of strong communication of the idea
- To find several of the tools described in the lab manual, which are necessary in turning an opportunity into business

### **Skills**

- \* Creativity
- \* Risk taking
- \* Proactivity
- \* Networking
- \* Communication

### **Questions for reflections/self-reflections**

- Where do ideas come from? What was the role of the entrepreneur in this case?
- What should the business canvas describe in this case?

- Why did Pagonis collaborate with Freevia in this case?
- Which was the organization and management structure of the case? Any thoughts on it?
- SWOT analysis and the project. How important is it: a) for decision making? b) For leveraging the project's potential?

## 2.2. Consorzio Vacche Rosse (Red Cow Consortium)

### Company presentation

<b>Country / City</b>	Italy/Reggio Emilia
<b>Products</b>	Parmigiano Reggiano Vacche Rosse (Red Cows Parmigiano Reggiano) PDO cheese, other dairy products only from Red Cows or Reggiana breed milk and/or by-products
<b>Legal form</b>	Consortium <u>of producers</u> with 26 dairy farms associated (2020)
<b>Year of foundation</b>	1991
<b>Number of employees</b>	19 (2019)
<b>Market (target customers)</b>	Cheese lovers interested to support biodiversity and sustainability deriving from local foods
<b>Exports (% of turnover)</b>	
<b>Main competitors</b>	Other premium long time ripened hard cheeses
<b>Turnover (optional)</b>	8.000.000 € (2019)
<b>Type of company (start-up, spin-off, established) at the time of the innovation</b>	Start up
<b>If a startup – education and work history of the entrepreneurial team</b>	Group of breeders initially not connected to academy

### 1) Brief description of the sector and the sub-sector in the country

The dairy sector in Italy represents one of the main sectors for turnover and a larger part of Italian food industry is produced by companies manufacturing products protected by Geographical Indications (GI).

All the Italian GI cheeses accounted for 4.099 million € (value at the dairy), representing more than 56% of the total turnover of food GI products. The turnover

of Parmigiano-Reggiano (PR) PDO and Grana Padano (GP) PDO cheese dairies has been estimated at 1.434 and 1.277 million €, respectively (ISMEA Qualivita, 2019).

PR cheese is the second PDO cheese in Italy as ton produced in 2019 (about  $1.5 \times 10^5$  ton equivalent to 3.754.193 wheels) after GP cheese (5.164.579 wheels).

PR cheese in 2019 was made by 321 dairies. In 2020 the trend to the increase of the size of the dairies and the decrease of their number is continued (317 dairies compared to 733 in 1993) with the prevalence of cooperative dairies.

The social dairies, or cooperatives, in 2020 represent about 2/3 of the dairies.

The price of PR cheese is hit by periodical large fluctuations, ranging for example from 8.63 to 13.09 € in the period from 2015 to 2020 for the variety ripened for 24 months (CLAL, [https://www.clal.it/index.php?section=parmigiano\\_parma](https://www.clal.it/index.php?section=parmigiano_parma)).

In this frame the birth of a specific brand of PR cheese, linked to the use in purity of the milk from Reggiana breed, otherwise called "Fromentina" or "Vacca Rossa (Red Cow)" represented and represents a case of successful history meaningful for understanding how a niche cheese can add value, also avoiding these market fluctuations.

## **2) Short description of the case (half page)**

The traditional Reggiana breed used in the past for producing PR cheese is characterized by a dual aptitude (milk and meat). The mechanization of the farms with the introduction of the mechanical milking and the specialization of the cows for milk production fostered the diffusion of Friesian breed, inducing the progressive substitution of Red Cows with Friesian one. The increase of Friesian cattle population and the co-current decrease of those of Reggiana breed started in the late 1800's years and continued to late 1980's when the number of Reggiana cattle was lower than one thousand heads.

In the early 1990's some breeders of Reggiana breed, members of the National Association of Reggiana Cattle Breeders (ANABORARE) constituted in 1956, thought that the saving of the breed should have been possible by enhancing the connection with PR cheese, producing Red Cow PR PDO cheese, exclusively with Red Cow milk.

To reach the goal, these breeders funded Consorzio Vacche Rosse and asked and obtained to use the dairy of the historic dairy school Zanelli in Reggio Emilia, where in 1991 their production started. Two years later appeared on the market the first wheel.

Consorzio Vacche Rosse firstly produced its PR cheese only in the dairy located by Zanelli Institut, but later because of the small size of the dairy (10 cheese vats) it

started to produce Red Cow PR, in a second dairy, Latteria San Pietro in Valestra di Carpineti.

The success of the product ideated by Consorzio Vacche Rosse boosted the interest of other dairies, e.g. Latteria Sociale di Arceto, a dairy owned by 4 Madonne group, reaching in early 2010's years the number of 14 dairies producing Red Cow PR.

The success required to control the characteristics both of product and process, foreseeing some additional rules more cogent than those of PR PDO cheese. The compliance with these requirements was demanded to ANABORARE and, at present time, OCQ PR (Organizzazione Controllo Qualità Produzioni Regolamentate), the inspection body that certifies PR, certifies also the compliance of Red Cow PR with PR PDO regulation.

The value of Red Cow PR cheese, at the same age of ripening, is about 1/3 higher than PR cheese.

By side, the success of this case opened the perspective for the production of other PR cheese varieties obtained with pure milk of Bruna (Brown) breed (Di Sola Bruna) or "Bianca Modenese".

From 2017 Consorzio Vacche Rosse is associated to GranTerre group, including 13 associates and the dairy Parmareggio (<https://www.granterre.it/index.php/filiera/soci-e-produttori>)

## **The idea: NICHE MARKET CREATION**

### **3) Origins**

The project of some out of the breeders associated to ANABORARE started in 1991 as an entrepreneurial idea for a start-up, supported by "Centro Ricerche Produzioni Animali (CRPA-SpA)", a limited company participated by local administrations of Emilia Region, national organizations of farmers or organizations of producers, as for example the Consortium of Parmigiano Reggiano cheese. CRPA collected the interest of the Italian Ministry of Agriculture and the Region Emilia Romagna that funded the initiative.

The initial project was to transform in purity Red Cow milk under the rules of PR PDO cheese to obtain a PR cheese brand identified by the logo Red Cow PR cheese, characterizing both process and product so to obtain a niche product for a market of food lovers, anticipating many of the today themes of support to biodiversity and sustainability, because of the keeping of local cattle breeds in the territory where they developed.

### **The type of collaboration:**

Differently from the typical start-up companies often born from an idea of academy, in this case interestingly the flow was reversed (bottom-up approach). From this entrepreneurial idea, academy has been involved and stimulated to scientifically understand the characteristics of the product and to study methods for the defense from frauds. Funding of the researches derived from public competitions announced by Europe or other national or local government.

The studies are directed both to genetic breed selection and farm management for improving the suitability of Reggiana cattle for milk production, both to investigate how to demonstrate the exclusively use of Reggiana milk, or in other words, the presence of milk from other breeds in Red Cow PR cheeses.

As the cheese-making technology is the same of the PR PDO cheese, all the studies made to improve PR cheese are of interest also for Red Cows Consortium.

Other direction of the interactions with CRPA and academia is the study of the possibility to use Reggiana milk also for other dairy products, e.g. fresh cheeses and butter.

### The innovation:

1. **Introduction:** presentation of the innovative product and of its innovative characteristics.

The innovative product is a special brand of Parmigiano Reggiano PDO cheese with the mark "Vacche Rosse" impressed on the flat surface of the cheese arranged in a radial pattern around a central circle with the picture of a cow of Reggiana breed (RAZZA REGGIANA).





The measurable (chemical composition and texture) properties of Red Cows PR are about the same of a corresponding PR cheese obtained with milk from Friesian or Brown milk with a minimum age of ripening of 24 months.

One potential measurable difference may be in the quality of fatty acids (e.g, conjugated linoleic acids – CLA) deriving from a higher degree of grass and local forage in the diet of Reggiana cattle. Naturally, no general rules of PR cheese prohibit the use of grass and many other PR cheeses can have a similar fatty acid profile.

The sensory properties of Red Cow PR are generally recognized as those of a premium cheese, but they can be considered as equivalent to those of PR cheese obtained in a small dairy, where the cheese-maker can follow each cheese-making operation not pressed by the urgency created by the need of repeating several times the same operation. As previously said, the increase of the productive capacity of the average PR dairy makes more and more common the need to better organize the cheese-making operations with the aim to obtain a reproducible quality more easily recognized by consumers.

As a result, in the case of PR cheese, it is not possible to easily recognize the cheeses originating from small dairies with specific characteristics, e.g, the origin of milk from rare breeds (Reggiana, Bruna, Modenese) or the production in mountain areas. The creation of marks and specifically the mark Red Cows PR focuses the attention of the consumer interested on this characteristic.

In this way, some aspects of not material quality as rarity, the feeling to eat a special product and/or that of participating to support a project for biodiversity and sustainability become evident and can drive the consumers' choice.

The reduced quantity of a niche cheese together with its prolonged shelf life after the long ripening make possible the contact with a population of consumers located in the entire world.

Traditional export, and in these years the developing of E-commerce, furtherly favored the success of Red Cows PR cheese.

The innovation was the ability to understand the existence of a market of cheese lovers and to satisfy the expectations, selling an ultra-traditional product presenting it as an innovative one. This idea ideally represents the closure of the circle of the sentence on "the today innovation that is yesterday tradition"

#### **4) Business – plan // Business model**

**Partners:** Today Consorzio Vacche Rosse is an association of 26 breeders (<https://www.consorziovaccherosse.it/en/the-red-cows-consortium/associated->

[farms/](#) which key activity is the production of Red Cow PR together with those of some other dairy products as fresh cheese, yogurt, butter, ricotta etc (<https://www.consortiovaccherosse.it/en/other-products-of-red-cows-butter-ricotta/fresh-dairy/>) which allows for a better use of PR cheese by-products (cream and whey). The production of fresh cheeses allows for a ready cash flow. In 2016 the milk was collected from 19 farms, as reported in Guida al Parmigiano Reggiano (Slow Food Editore, pag 211).

Consortio Vacche Rosse together with CRPA and University of Parma is part of GOI (Gruppi Operativi per l'Innovazione) Biodiversità (Biodiversity Operational Group) ([http://biodiversita.crpa.it/media/documents/biodiversita\\_wwww/documenti/poster/Ro tselaar\\_29112018.pdf](http://biodiversita.crpa.it/media/documents/biodiversita_wwww/documenti/poster/Ro tselaar_29112018.pdf)) co-funded by Regione Emilia Romagna with the aim to enhance the dairy products from regional autochthonous breeds also by creating new sales channels.

**The key resource** is the Reggiana milk, while as said the technology and the equipment are the traditional ones used for PR cheese-making.

**The value proposition** is based on the message that customers buy a premium cheese which process is regulated by strong regulations obtained with milk of a disappearing cattle breed. Eating Cow Red PR cheese the consumer eats a "double" specialty cheese, also in Italy that is one the countries producing a large variety of specialty cheeses. At the same time, the consumer lives the perspective to support the keeping of a niche system contrasting the transition to a shift of regime as that represented by the introduction of a "industrial" cattle breed and by the increasing size of the dairies. At the same time, the niche can stimulate transformation by 'linking up' with tensions in the incumbent conventional regime (including growing awareness of the environment by consumers and producers) and can provide solutions favouring the niche development. In the specific case, the innovation made by Consortio Vacche Rosse stimulated the growth of other PR cheese brands (as "Di Solo Bruna PR PDO cheese" - [http://www.disolabruna.it/Prodotti/Parmigiano\\_Reggiano\\_Dop.html](http://www.disolabruna.it/Prodotti/Parmigiano_Reggiano_Dop.html), "Bianca Modenese PR PDO cheese" - <http://www.consorziobiancamodenese.it/prodotti.html>, "PR cheese product of the mountain" <https://www.parmigianoreggiano.com/it/news/consorzio-del-parmigiano-reggiano-una-nuova-campagna-stampa-per-promuovere-il-prodotto-di-montagna/>) forcing the Consortio Parmigiano Reggiano firstly to accept and the to support these ventures.

The small amount of Red Cow PR cheese made possible to often engage direct customer relations, all over the world (<https://www.consortiovaccherosse.it/en/the-red-cows-consortium/a-success-in-the-world/>). Satisfied customers are the most

powerful advocates of the success of the product in the market, giving a small company the strength to enter in B2B world. The small amount of product is responsible for the higher price of Red Cow PR PDO cheese and for its stability over time, facing the oscillation of price of PR PDO cheese (Menghi et al., 2015 - [https://www.researchgate.net/publication/277633687\\_Costi\\_di\\_produzione\\_e\\_redditi\\_vita\\_della\\_vacca\\_rossa\\_Reggiana](https://www.researchgate.net/publication/277633687_Costi_di_produzione_e_redditi_vita_della_vacca_rossa_Reggiana))

**The channels of sale** are its own E-shop (<https://www.consortiovaccherosse.it/en/shop/>) and the agreements with physical shops and other E-shops acting as dealers, among those can be cited Eataly ([https://today.eataly.net/milano\\_it/parmigiano-reggiano-vacche-rosse-24-mesi-500g-consorzio-vacche-rosse](https://today.eataly.net/milano_it/parmigiano-reggiano-vacche-rosse-24-mesi-500g-consorzio-vacche-rosse)).

Demographical, geographic, and behavioral customer segmentation are little practiced while customer journey based segmentation is made for the customers clicking on its own E-shop

**The types and proportion of fixed and variable costs** are those typical of a small dairy producing PR cheese, as discussed by CRPA (<https://agricoltura.regione.emilia-romagna.it/archivio-agricoltura/2014/giugno-2014/supplemento-rivista-agricoltura-n-56>).

The presence of 10 cheese vats allowed for a maximum daily production of 24 cheeses, corresponding to 8760 wheels/years. The PR PDO cheese regulation does not allow to replicate the use of the cheese vats as in GP PDO cheese case, and this rule establishes a fixed connection between number of vats and maximum number of manufactured cheeses, daily ( $n \text{ cheeses} = n \text{ vats} \times 2 + 15\%$ ).

According to "Piano di Regolazione dell'Offerta Produttiva" ([https://registro.parmigianoreggiano.it/qlpr/linkDocument?n=Regolamento+Applicativo+Piano+20-22\\_26\\_FEB\\_20.pdf&a=true&f=true&d=true](https://registro.parmigianoreggiano.it/qlpr/linkDocument?n=Regolamento+Applicativo+Piano+20-22_26_FEB_20.pdf&a=true&f=true&d=true)), each farm can yearly produce, without penalties, an assigned amount of milk. As a result, each dairy can produce a number of wheels corresponding to the amount of milk collected.

To satisfy the increasing demand of Cow Red PR cheese, and the increasing availability of milk given by the increase of the farms associated to Consorzio Vacche Rosse (26 in 2020) part of the cheese production is actually made by a second dairy (Latteria San Pietro- <https://www.latteriadivalestra.it/>).

All these rules represent a strong constraint for developing the capacity level, making difficult the optimization of fixed cost items, as direct labour and/or manufacturing overheads (e.g. depreciation on equipment, rent on the factory building etc). These constraints are not specific for Consorzio Vacche Rosse, but are common for all PR PDO cheese dairies.

In 2017 Consorzio Vacche Rosse buy the locals of the dairy from the owner, Provincia di Reggio Emilia.

The revenue streams are firstly composed by recurrent revenues generated by marketing Red Cow PR PDO cheeses and the other dairy products obtained with Reggiana milk and, in minor part, by project revenues, as those funded by Regional projects for Rural Development (see for example the cited Biodiversity GOI) aimed to create products based on milk from local breeds.

## Market Analysis

According to data of ANABORARE the production of Cow Red PR PDO cheeses accounted in 2019 to about 20.000 wheels, with a slight decrease compared to 2018. This cheese production corresponded to an availability of more than 11.000 ton of Reggiana milk. The estimated average cheese yield is about 7%. The dairies producing Red Cow PR PDO cheese are 14 since 2009 (<https://www.razzareggiana.it/en/reggiana-breed-parmigiano-reggiano-red-cows/production-over-the-years/>).

Consorzio Vacche Rosse is the main company of this niche, covering about the half of the market.

ANABORARE listed other seven producers of Red Cow PR PDO cheeses (<https://www.razzareggiana.it/en/where-to-buy/>): four are farms that give their milk to dairies for cheese manufacturing, while the other three are dairies producing both Red Cow PR PDO cheese, both other PR PDO cheeses (Di Sola Bruna, organic, mountain cheese etc).

Some other dairies, not present in the list of ANABORARE, declare to make some wheels of PR cheese with Reggiana milk, as Latteria di Arceto that produces 3 wheels/day ([https://www.caseificio4madonne.it/chi-siamo/i-nostri--stabilimenti?utm\\_source=google&utm\\_medium=organic](https://www.caseificio4madonne.it/chi-siamo/i-nostri--stabilimenti?utm_source=google&utm_medium=organic)) for about 1.000 wheels/year. Latteria di Arceto is part of Caseificio 4 Madonne group, associated to GranTerre group, one of the largest cooperatives in the area of PR PDO cheese.

Competitors of Consorzio Vacche Rosse can be classified as direct competitors (other dairies producing Cow Red PR PDO cheeses, marked and certified with the same common brand controlled by ANABORARE) and "indirect" competitors producing PR PDO cheese with milk of other local breeds (Bianca Modenese) or in purity with milk of Brown breed.

PR PDO cheese without other additional marks cannot be considered as a competitor, as the mark PR PDO cheese is the common mark making famous the

cheese everywhere. Competition is inside the “Red Cow” niche and with other niche PR PDO cheeses, looking at consumers of premium cheeses.

The **advantage** of Consorzio Vacche Rosse towards other dairies producing Red Cow PR cheese is in the fact that Consorzio Vacche Rosse dairy transform only Reggiana milk produced by its associated farms and this constitutes a sort of high level guarantee for the consumer that is buying real Red Cow cheese.

This concept is stressed by the Regulation of ANABORARE for the use of mark that allows only to Red Cow PR PDO cheese the option to be sold as grated cheese.

The *risk of frauds* is managed by ANABORARE by means of analytical tools aimed to detect the presence of milk from other breeds. University of Bologna proposed a method to trace the identity of Red Cow PR cheese based on the detection of allele *e* of the Melanocortin 1 receptor (*MC1R*) locus responsible for the coat color. The other breeds carry other alleles or allele *e* at very low frequency. As a result, using the *MC1R* locus it is possible to identify the presence of milk from some other breeds in Parmigiano Reggiano cheese labelled as exclusively from the Reggiana breed, with a lower detection limit estimated to be 5% of non expected DNA (Russo et al. 2007 - <https://www.tandfonline.com/doi/abs/10.4081/ijas.2007.257>).

The small size of the dairy and its artisanal management is as said a further guarantee the best cheeses have a premium quality. The risk, intrinsic for artisanal product to also have a higher number of not perfect cheeses than a dairy aimed to a more reproducible “quality”, may be managed by the production of processed cheeses, as “spread cream of Red Cow PR cheese”, not at disposition for international shipping as it requires a short refrigerated shelf life.

The advantage of Consorzio Vacche Rosse towards dairies producing PR cheese with milk of Bianca Modenese is in the fact that Bianca Modenese PR cheese is a niche cheese in the world of niche cheeses, and Bianca Modenese breeder are associated to some projects of Consorzio Vacche Rosse as the cited GOI-Biodiversity.

PR PDO cheese with Brown milk is only one of the products obtained in all Italy with the milk of this breed (see - <http://www.disolabruna.it/prodotti.html>) and for this reason the link between Red Cow PR cheese and territory appear stronger and exclusive for the cheeses made with Reggiana breed than for those made with Brown milk. Near all the production of Reggiana milk is concentrated in the area of Reggio Emilia and Parma, Reggiana represents a niche compared to the population of Brown breed.

Finally, the very limited production of Red Cow PR PDO cheese makes the issue of competition less important, until the overall quality of the cheese will be kept unchanged. To do this, producers will resist to the temptation to increase capacity

and/or profitability, adapting the cheese-making practices to some of the opportunities present in the standard of processing of PR PDO cheese.

The leading position of Consorzio Vacche Rosse in the production and marketing of Red Cow PR PDO cheese and the strong image of the product made less necessary to act on the price as instrument to boost the sell. Places of distribution the product as said are premium physical shops and the E-commerce, managed by the own E-shop and in collaboration with other premium E-shops as that of Eataly.

To enter in the GDO sector and increase export, in 2017 Consorzio Vacche Rosse became associate of GranTerre group, a cooperative leader in the sector of PR PDO cheese (<https://www.granterre.it/index.php/filiera/soci-e-produttori>), owner of Parmareggio.

### **Market trends, evaluation of the potential market**

The trend for premium foods, which consumption represents a distinctive trait, continues to be relevant in the Italian and European market. Furthermore, despite of the growing criticism towards the animal products as responsible for the environmental sustainability of the planet, breeding of disappearing breeds as Red Cows is considered useful for keeping the cultural heritage. So, Red Cow PR PDO cheese continues to flow in a market without crisis, with a potential market larger than the product offer, that cannot substantially increase in the future.

### **SWOT ANALYSIS**

#### ***Strengths***

1. To be perceived as a premium selection of a premium cheese (PR PDO cheese)
2. All the strengths of PR PDO cheese
3. Niche product obtained in few small dairies
4. Keeping of traditional cheese-making technology, with a main role of the cheese-maker ability
5. Longer ripening time (> 24 mo)
6. Eating Cow Red PR PDO cheese is perceived as an aid to save disappearing animal breeds and an ancient way to produce cheese

#### ***Weaknesses***

1. Limited possibility to react to cheese-making problems (e.g. microbiological defects) using the opportunities given by technology.
2. Higher production costs, also compared to PR PDO cheese

#### ***Opportunities***



1. The stronger integration with a larger company able to improve the marketing and sales network

### **Threats**

1. The temptation to increase the productivity of the dairy, changing technology and quality
2. The success of this product will contribute to increase the number of Reggiana cattle. An increasing availability of milk risks to push other dairies to make Red Cow PR PDO cheese "formally" respecting the rules, but with a medium quality, so to improve efficiency and turnover.
3. The production of other 100% "Red Cow" hard cheeses, obtained out of PDO scheme with shorter ripening time and lower quality, but lower price

### **MARKETING MIX**

**Place:** the e-shop of the Consortium (<https://www.consortiovaccherosse.it/en/shop/>) and other e-shops; premium food chains as Eataly ([https://today.eataly.net/milano\\_it/parmigiano-reggiano-vacche-rosse-24-mesi-500g-consorzio-vacche-rosse](https://today.eataly.net/milano_it/parmigiano-reggiano-vacche-rosse-24-mesi-500g-consorzio-vacche-rosse)), or gastronomy stores

**Price:** high

**Product:** unique, innovative because of its high degree of traditionality, fitting perfectly to a gourmand dinner

**Communication - Promotion:** Red Cow Consortium promotes its PR PDO cheese and other Red Cow products by live promotion in the super markets with personnel hired for that purpose. Promotion of Red Cow PR PDO cheese by means of price reduction is forbidden by the regulation of ANABORARE for the use of the mark. Communication is made using the own web page, that of ANABORARE, attending to national and international fairs and using social media. However, word of mouth among consumers is an important way of communicating the sensory experience associated with the consumption of Red Cow PR PDO cheese.

**Distribution** has been described above.

### **Product design:**

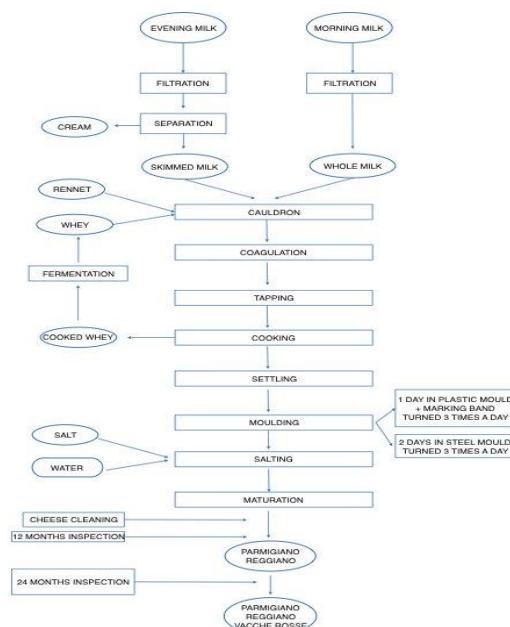
The initial project was to transform in purity Red Cow milk under the rules of PR PDO cheese to obtain a PR cheese brand identified by the logo Red Cow PR cheese, characterizing both process and product so to obtain a niche product for a market of food lovers, anticipating many of the today themes of support to biodiversity and sustainability, because of the keeping of local cattle breeds in the territory where they developed.

The success required to control the characteristics both of product and process, foreseeing some additional rules more cogent than those of PR PDO cheese. The design of Red Cow PR PDO cheese is the discovery of a traditional cheese focused on the safeguard of the properties of the main ingredient, the raw milk exclusively obtained by Reggiana breed, reared with local feeding in a proportion (90%) higher than 75% required by PR PDO cheese standard, avoiding the practice of unified and preferring fresh grass when possible. The compliance with these requirements was demanded to ANABORARE and, at present time, OCQ PR (Organizzazione Controllo Qualità Produzioni Regolamentate), the inspection body that certifies PR, certifies also the compliance of Red Cow PR with PR PDO regulation.

To support this success, genetic breed selection and farm management were improved for increasing the suitability of Reggiana cattle for milk production. By side, studies were made to find analytical tools able to demonstrate the exclusively use of Reggiana milk, by the detection of the presence of milk from other breeds in Red Cow PR cheeses.

Finally, as the cheese-making technology is the same of the PR PDO cheese, all the studies made to improve PR cheese are of interest also for Red Cows Consortium. To better exploit the properties of the milk, the cheese-making technology is the traditional one, typical of PR PDO cheese made in small sized dairy, where the cheese-maker follows the output of each wheel. The product has a minimum ripening time of 24 months instead of 12 of the PR PDO cheese.

The flow sheet as a result is that typical of PR PDO cheese (<https://www.consortiovaccherosse.it/en/red-cows-parmigiano-reggiano/how-it-is-made/>)



To keep the highest quality level, the part of cheese production not directly made in the dairy owned by Consorzio Vacche Rosse is made in a second small dairy (Latteria San Pietro di Valestra, cited) located in the mountain area of Reggio Emilia, following the same manufacturing “philosophy”, which cheese has been awarded at the “World Cheese Award” in London in 2017 as the best unpasteurized cheese (<https://www.latteriadivalestra.it/i-premi/>). The unique quality of the product does not foresee a scaling up of equipment and/or manufacturing methods for increase the capacity, never using the reduced chances of innovation allowed by the general PR PDO cheese standard.

To improve the efficiency of the milk production system aimed to obtain an higher milk capacity reducing the gap with Friesian and Brown cows, studies on the best genetic traits to be selected are carried out (e.g. Fontanesi et al. 2015; [https://www.researchgate.net/publication/274406392 Association of 20 candidate gene markers with milk production and composition traits in sires of Reggiana bred a local dairy cattle population](https://www.researchgate.net/publication/274406392_Association_of_20_candidate_gene_markers_with_milk_production_and_composition_traits_in_sires_of_Reggiana_bred_a_local_dairy_cattle_population)) .

The quality assurance process is guaranteed by the attention of all the workers and by the double system of controls made by inspectors of ANABORARE and OCQ-PR.

### **Production process. Restrictions of the product development.**

The milk and cheese system at the basis of Red Cow PR PDO cheese is strongly regulated, Regulation obviously is a restriction of the product development, mainly as production capacity. The problem of a successful niche product starts when producer decides to goes out from the niche.

### **5) Financial data – financing, types of funding**

The Company is a cooperative mainly funded by the revenues deriving from the trade of its dairy products, mainly Red Cow PR PDO cheese. Attendance to European and or national/local projects contributes to funding.

Initial funding by Italian Ministry of Agriculture and Regione Emilia Romagna and the possibility to rent the dairy of Istituto Zanelli made possible the start of the operations by Consorzio Vacche Rosse without the need to search for other relevant capitals given by business angels, venture capitals or corporate investors.

### **The story so far**

In 2017 Consorzio Vacche Rosse bought the dairy from the Provincia of Reggio Emilia and became ordinary associated of Granterre group. Actually Consorzio Vacche Rosse has 19 employees (<https://business.bigprofiles.it/company/01463760353>) with a turnover of about 8 million Euros in 2020. Red Cows PR PDO cheese continues to be the main product of the company.

## 6) Keywords, main training competences and skills

### Keywords:

Dairy, PDO cheese, artisanal cheese, Red Cow, disappearing breeds, niche product, tradition, supplementary rules, quality control

### Main training competences:

The case study outlines the business canvas of the real Red Cow PR PDO cheese

### Training objectives:

- To understand how defense of tradition can become an opportunity to develop business
- To realize the case where the defense of tradition becomes a driver for innovation
- To organize production avoiding shortcuts decreasing the perceived quality
- To understand how a business operation can be strengthened by direct or indirect interaction with academic research
- To realize the need that an entrepreneurial idea needs to be integrated with a company able to support marketing and sale network
- To consider the important role of communication of the idea

### Skills:

- \* Creativity
- \* Risk taking
- \* Proactivity
- \* Networking
- \* Communication

### Questions for reflections/self-reflections

- Where do ideas come from? What was the role of the entrepreneur in this case?
- What should the business canvas describe in this case?
- Which was the organization and management structure of the case? Any thoughts on it?
- SWOT analysis and the project. How important is it: a) for decision making? b) for leveraging the project's potential?

## 2.3. Mlekovita dairy company

### Company presentation

<b>Country / City</b>	Poland, Wysokie Mazowieckie
<b>Products</b>	Dairy and dairy products
<b>Legal form</b>	Dairy cooperative
<b>Year of foundation</b>	1928
<b>Number of employees</b>	5 thousands
<b>Market (target customers)</b>	All age group
<b>Exports (% of turnover)</b>	35%
<b>Main competitors</b>	Mlekpól, Polmlek
<b>Turnover (optional)</b>	-
<b>Type of company (start-up, spin-off, established) at the time of the innovation</b>	Established company
<b>If a startup – education and work history of the entrepreneurial team</b>	-

### 1) Brief description of the sector and the sub-sector in the country

The dairy sector in the country is developing rapidly, in 2019 there was a spike in milk production with a simultaneous decline in the number of people. The most common tendencies are: increasing the specialization of the holdings, increasing the number of herds in one farm and increasing milk yield of cows. Mleczarska Mlekovita is constantly developing. Regardless of the market situation, the growing dynamics of purchased milk from suppliers is maintained. Polish dairy producers and in the Leadership Market leaders have an increasing share in the export. The Mlekovita group exports milk species to 167 countries. Only in the first quarter of 2020 year, the export was around to 30% in terms of gross domestic product. More and more

often consumers reach for their favorite products with proven and repeatable quality - and this is what Mlekovita offers.

## 2) Short description of the case

For many years, Mlekovita dairy company has been one of the most dynamically developing milk processing plant in Poland and is the largest and most modern company in the dairy industry. The cooperative has existed since 1928, but has been known as the MLEKOVITA brand since 1992. Today's MLEKOVITA is not only products with a well-known logo - it is the overall activity and commitment to every aspect of the business. It is a company with 100% Polish capital created from scratch, which effectively builds its position on the market thanks to the involvement of the President and Employees. MLEKOVITA, as a well-recognized brand based on the message: "Polish", has been winning the trust of customers and setting trends on the market for over 90 years, offering the highest quality dairy products - the largest selection of dairy products in Poland and Europe. The Mlekovita Group is the largest dairy group in the Central and Eastern Europe with 20 production plants. Mlekovita is a leader in dairy production. The most important advantages of Mlekovita is: the highest milk quality, attractive products, specialized workforce, innovation, the most modern machinery and continuous improvement. The top management creates a strong pillar of the company and actively participates in achieving the set goals, as a result of which Mlekovita achieves excellent results. SM Mlekovita have implemented FSSC 22000; PN-EN ISO 14001: 2015; PN-EN ISO 9001: 2015. EU programs: Purchase of infrastructure and laboratory equipment for the Mlekovita Research and Development Center; Construction of a cogeneration boiler house for Spółdzielnia Mleczarska MLEKOVITA - a heat and power plant in high-efficiency gas cogeneration technology for the Plant in Trzebowisko. 134/5000.

Mlekovita's achievements include many prestigious awards, which cannot be listed, detailed information is available on the website: <https://www.mlekovita.com.pl/pl/aktualnosci/nagrody>

## 3) Brief description of the innovation

**An Idea:** The idea of producing **Dar Pro Whey Drink** was to create a product as a result of market analyze/market demand for a probiotic that is digestible for the Polish population. The product was created with the participation of representatives of the Prolab company and the Mlekovita Research and Development Center.

**Type of cooperation:** Cooperation agreement with Prolab Sp. z o.o., limited partnership based in Krakow

The Prolab Company is a research and implementation microenterprise specializing in the research and implementation of probiotics, both as ingredients of medicinal



products and dietary supplements and foodstuffs. Many of the implemented products have been evaluated for efficacy and safety in single and multicentre clinical trials, which has proved beneficial in all cases. The result of the projects carried out are products introduced to the market together with companies producing in Poland and abroad, including: medicinal products, medical devices, dietary supplements, and cosmetic products.

The company is the owner and co-owner of approximately 40 Polish and international patents. Recently, Prolab has been focusing on research on the beneficial effects of selected probiotics on the correct composition of the human gut microbiota in various age groups and on the assessment of the impact of such changes on health, as well as on new technologies for the multiplication of probiotic bacteria for the food industry.

The R&D research carried out by Prolab so far also resulted in the implementation of the DarPRO + foodstuff into production. The product was put into production by SM Mlekovita. DarPRO + contains live lactobacilli which, thanks to their strong probiotic properties, have a positive effect on the flora of the digestive tract.

#### 4) Innovation:

**Introduction: DarPRO fermented probiotic whey beverage with strawberry and lemon flavour 150 g.**

DarPRO is a whey fermented drink based on an innovative technology. It contains billions of selected and thoroughly tested in Poland, live *Lactobacillus plantarum* PL4 bacteria, which naturally occur in the digestive tract of a healthy people, as well as easily digestible whey proteins and B vitamins.

The *Lactobacillus plantarum* PL4 have been patented **Pat.232906**: New bacterial strain of *Lactobacillus plantarum* PL4.

PROPERTIES: DarPRO contains viable ***Lactobacillus plantarum*** PL4 bacteria. The *Lactobacillus plantarum* PL4 strain was isolated from the digestive tract of a healthy people. The scientific research of the PL4 strain confirms its ability to:

- Adherence, ie. the ability to adhere to the intestinal mucosa,
- Inhibiting the growth of fungi and bacteria,
- Resistance to gastric juice,
- Stimulating the production of proteins that seal to the gut.

DarPRO is a drink produced according to the original recipe based on raw milk material, from which the ingredients contained in the product come from, necessary for the nutrition of people requiring a wholesome, easily digestible diet, such as:  $\beta$ -

lactoglobulin,  $\alpha$ -lactalbumin, as well as B vitamins, mineral salts. As a result of obtaining one billion live bacteria of the *Lactobacillus plantarum* PL4 strain in a 150 ml portion of the product, DarPRO has special properties. The action of DarPRO is based mainly on the activity of bacteria belonging to the *Lactobacillus plantarum* PL4 strain, favourably modifying the composition of the intestinal microbiota changed as a result of the action of factors disturbing its composition. The *Lactobacillus plantarum* PL4 strain has been selected and thoroughly tested in Poland. These bacteria are present in the digestive tract of healthy people, are resistant to the action of gastric juice and bile salts, so that they can reach the intestines alive and fulfil their beneficial role there, they show an outstanding ability to adhere to the intestinal mucosa, thanks to which they quickly colonize the digestive tract and are capable of eliminating pathogenic bacteria causing acute or chronic diarrhea, are safe, non-toxic and non-pathogenic.

*Lactobacillus plantarum* PL4 significantly improves the functioning of the gastrointestinal tract thanks to the properties that enable the sealing of the intestinal barrier, has a strong antioxidant effect, thanks to which it extinguishes inflammation of the intestine, and also counteracts their causes by eliminating pathogenic bacteria.

The DarPRO drink is recommended for children over 3 years of age and adults who have gastrointestinal disorders associated with an abnormal composition of the intestinal microflora during and after treatment with antibiotics, during and after diarrhea of various origins, as well as in convalescence after a long-term treatment and treatments. DarPRO can be used prophylactically when there is a diet change for various reasons, such as travel or when you are on a diet that eliminates unprocessed

## INTENDED USE

The product is intended for children over 3 years of age and for adults.

Dar PRO does not contain gluten, it can be administered to people who do not tolerate this ingredient.

**Maintaining proper health requires a balanced diet and a healthy lifestyle.**

## HOW TO USE

**It is recommended** to consume 1 bottle (150 ml) daily. It is not recommended to exceed two servings during the day. **The beneficial effect occurs** when 1 bottle (150 ml) of the product is consumed daily.

## CONTRAINDICATIONS AND PRECAUTIONS:

The product is not intended for parenteral use.

- It cannot be used as the sole source of food either, as maintaining proper health requires a balanced diet and a healthy lifestyle
- Do not use DarPRO drink if you are hypersensitive to any of its ingredients
- Do not use in patients with pancreatitis marked for parenteral use.
- It cannot be used as the sole source of food either, as maintaining proper health requires a balanced diet and a healthy lifestyle
- Do not use DarPRO drink if you are hypersensitive to any of its ingredients
- Do not use in patients with pancreatitis.

### **5) Business plan/ Business model:**

DarPRO fermented probiotic whey beverage with strawberry and lemon flavour 150 g. The raw material for the production is a sweet whey obtained during the production of a rennet cheeses. Flavourings are introduced to a specific batch. The product is acidified in the line for the production of fermented products and on the APV Stork packing machine, a technology developed with the participation of the consortium member - Prolab. Sales channels in Mlekovitka stores of 134 points in Poland and 32 Wholesale Cash & Carry. In addition, the product is available in store chains, e.g. Makro, and promoted through IN-OUT campaigns. Promotion of the Dar Pro production takes place in the trade magazines, on the website, through leaflets, etc.,.

### **Product development:**

Each batch of the product is tested in an external accredited laboratory to determine the viability of the *Lactobacillus plantarum* PL4 strain. The in-house laboratory tests each batch for basic physicochemical parameters: organoleptic evaluation, fat content, dry matter, acidity and periodically for protein and carbohydrate content; in addition, each batch is checked for basic microbiological parameters, i.e. coliform bacteria, moulds and yeasts and staphylococcus coagulase positive; verification of the viability of the *Lactobacillus plantarum* strain after application to dairy products.

### **Company's financing of the product development**

Up to date history of the Product: The product DarPRO fermented probiotic whey drink with strawberry and lemon flavour 150 g is produced exclusively at the domestic market. The barrier to entry to the target market is the legal restriction of communication on the packaging presented to the consumer and the inability to display all the advantages of the product. The product was also available in a natural version, but it turned out to be taste unacceptable for consumers.

### **SWOT Analysis**

### **Weak Points**

- A product with the name of the flavor profile, whey is not offered in Polish culture for consumption as a drink.
- Due to legislation in Polish and EU countries - no possibility to communicate the benefits of the product on the packaging label

### **Strong Points**

- Recognizable brand with undisputed reputation.
- Consumption of dairy products in Poland is increasing.
- Customers more and more often reach for products with added value – probiotic strain.
- Innovative high-quality product - an alternative to yoghurt with probiotic strains.
- Possibility of quick consumer evaluation of the product (Mlekovitka's own brand stores).
- Possibility to fast reaching the traditional market (through its own distribution network).

### **Opportunities**

Offering consumers a tasty specialty product with many health benefits at an acceptable price level and obtaining additional sales revenues.

### **Threats**

- Lack of acceptance of the product quality by consumers.
- Barrier of a long market launch process in terms of the modern channel (internal procedures of commercial networks).
- The threat posed by private labels (a careful analysis of the market by decision makers may result in the introduction of a product with the following parameters: identical or higher quality, competitive price, and through mass availability, lead to the elimination of a brand product from the market).

### **Marketing Mix (4P)**

**Product:** DarPRO fermented probiotic whey beverage with strawberry flavour 150 g and DarPRO fermented probiotic whey beverage with lemon flavour 150g- high quality product with added value.

**Price:** medium price range.

**Promotion:** discounts for regular customers, promotional campaigns in brand stores.

**Place:** own distribution channels - wholesalers and company stores, network of company stores.

## 6) Keywords, main training competences and skills

### Main training competences:

- Creativity.
- Risk taking
- Communication
- Openness to teamwork.

### Key words:

- Polish probiotic strain.
- Whey drink.

### Questions for reflections/self-reflections

- How and why can the health benefits of the probiotic strain *Lactobacillus plantarum* PL4 act as customer value?
- What was the innovative idea of developing Dar Pro Whey Drink?
- What are the strong and weak points identified in the SWOT analysis?
- Describe the process of the Dar Pro Whey Drink product development (NPD process).
- What is the Dar Pro Whey Drink production process?

Innovative Dairy Science

Education material development

## 2.4. Golden Donkeys Farm

### Company presentation

<b>Country / City</b>	Cyprus / Skarinou – Larnaka
<b>Products</b>	Donkey milk
<b>Legal form</b>	LTD
<b>Year of foundation</b>	2000
<b>Number of employees</b>	22
<b>Market (target customers)</b>	Cow's casein intolerance consumers and sensitive groups of population (especially young children and the elderly)
<b>Exports (% of turnover)</b>	(0.19%)
<b>Main competitors</b>	Non-local competitors
<b>Turnover (optional)</b>	1,087,111 euros
<b>Type of company (start-up, spin-off, established) at the time of the innovation</b>	Established
<b>If a startup – education and work history of the entrepreneurial team</b>	



## 1) Brief description of the sector and the sub-sector in the country

The Cypriot dairy sector is one of the leading economic sectors in the local food industry with high per capita consumption. With a production value of around 164,552 tons of cow's milk annually in Cyprus, cow's milk production contributes to 80% of the total milk production (Department of Agriculture of Cyprus, 2014). Furthermore, approximately 22,134 tons of sheep's milk and 21,848 tons of goat milk are being produced in Cyprus every year. Cyprus milk production is derived from cows, sheep, and goats with 25325, 213423 and 159231 animals respectively (Statistical Service of Cyprus, 2014). Since ancient times, Halloumi cheese is the most famous cheese on the island, and it is distinguished by its quality and taste. Halloumi exports account for a total of 12.5% annually, generating around 91 million Euros (Statistical Service of Cyprus, 2014) and Ministers in Cyprus are handling the registration of Halloumi as a PDO (Product of Designated Origin). Additionally, the donkey milk sub-sector is considered as one of the newest sectors of Cyprus dairy industry with limited production at the moment. Golden Donkey Farm is considered as a near-monopoly company, as there are some other smaller businesses which produce donkey milk but without the appropriate approval of the authorities.

## 2) Short description of the case

Golden Donkeys Farm is in Skarinou village, halfway between Larnaka and Limassol. That farm combines the love about Cyprus traditions, the local cultural heritage and the passion about donkeys. Donkeys are an integral part of Cyprus history as they were used for many centuries as a mean of transportation and agricultural activities. Today, the farm rears approximately 200 donkeys which the 100 are female donkeys and produces up to 30 litres of donkey milk per day. Golden Donkeys meets all animal welfare requirements, in accordance with the European regulations. Additionally, the Golden Donkeys farm is the only licensed farm in Cyprus that has approval from the local authorities to produce, process and trade donkey milk. For that purposes, a specially designed parlour was established for the optimal donkeys' milking, while donkey milk is pasteurized and processed at an on-farm ISO22000 certified dairy lab. Except for its fresh-pasteurized and freeze-dried form, Donkey milk is used to produce other novel products such as cosmetics, chocolates, liqueurs and many others. Finally, the farm area is utilized as a multicultural and traditional place where people of all ages can have fun. The place includes a wax museum that enlivens the forms of Cypriot professions that have been forgotten over time. Various activities and events are being organized at the farm too.

**The idea:** Donkey milk products (pasteurized milk, freeze-dried milk powder)

## 3) Origins:

- The idea for the commercialization and utilization of donkey milk as an ingredient for a range of innovative products was part of the portfolio of an established company. It should be mentioned that the company's focus was the tourism industry as the major operation was a theme park showcasing Cyprus heritage and tradition. Donkey milk was mentioned/asked for by customers that were acquainted with the product.
- The production of donkey milk can be considered as an incremental innovation at a national level as the Golden Donkeys Farm is the first company in Cyprus which produces donkey milk.

### **The type of collaboration:**

- The donkey milk and donkey milk products line were a result of a collaboration with the academia i.e. Cyprus University of Technology. The collaboration could be described as multileveled :
- Direct funding of PhD projects by the Golden Donkeys Farm.
- Participation in competitive national and international funding for innovative products.
- Academia - company type of agreements/contacts in place.

### **The innovation: Description– The Donkey milk**

Donkey milk is considered as an alternative, anti-allergic milk type with beneficial properties. Its components (especially lysozyme) have beneficial effects on consumer health. It contains very low fat and protein composition in contrast to cow milk, while its vitamin C content is much higher. It also contains vitamins A, B1, B2, B6, D, E and it is as a good source of calcium, phosphorus, sodium, iron, zinc and glycerin immunoglobulins. Additionally, it has high lactose, low casein composition and its nutritional profile is very similar to that of breast (mother's) milk. Donkey milk is very digestible with light, sweet and pleasant flavor. Thus, it is used as an alternative milk for children suffered from cow's milk allergy (CMA).

Furthermore, it was used for many decades against many diseases such as tuberculosis, vitiligo, osteoporosis. It helps in proper digestion, GIT truck function and collagen creation. Also, according to recent studies, donkey milk has anti-ageing properties and is the pre-eminent product for tightening the skin, while it contributes to the regeneration of skin cells.

Additionally, raw donkey milk usually contains a very low microbial population because of its high lysozyme composition. Lysozyme is antimicrobial enzyme, found as a natural ingredient in tears, saliva, blood and breast milk. It catalyzes the hydrolysis of 1,4-beta-linkages between N-acetylmuramic acid and N-acetyl-D-

glucosamine residues in peptidoglycan, which is the major component of gram-positive bacterial cell wall.

#### **4) Business – plan / Business model:**

- **Key Partners**

1. Feed Suppliers
2. Veterinarians
3. Animal Scientists
4. Technicians
5. Package suppliers
6. Cosmetics manufacturer

- **Key Activities**

1. Production of pasteurized donkey milk and freeze-dried donkey milk powder.
2. Production of other novel products such as cosmetics, chocolates, liqueurs with donkey milk.
3. Hospitality services at the farm. The place includes a traditional restaurant, a wax museum that enlivens the forms of Cypriot professions that have been forgotten over time.
4. Various activities and events are being organized in the farm too.

- **Key Resources**

1. Raw donkey milk is produced on the farm.
2. Packaging equipment are purchased from approved suppliers.
3. There is a milk pasteurization line which then splits into (a) bottling and (b) freeze-drying.

- **Value Proposition**

Commitment to creativity, authenticity and hospitality, and dedication to the organic growth of the donkey milk.

1. Donkey farm: Contribution to the conservation of the endangered donkey species and utilization of the novel produced products, such as donkey milk.
2. For the customer experience, services were designed to offer something unique and authentic: Making the most of flora and fauna of Cyprus, sizing the Cyprus climate with abundant sunshine and enjoying the Cyprus hospitality.

3. Enhancing the customer experience in a place that offers peace and comfort, enjoying the traditional beauties of the place.

- **Customer Relations**

1. The new donkey milk product started to be communicated among different age groups mainly through on farm events (i.e. folklore festivals) and local media coverage. Additionally, social media were utilized, "word of mouth", and customer relations are continuously built through direct personal sales (direct delivery service).

- **Channels**

1. Products are being promoted at selected retail stores, at the farm's shop, and through the social media. Golden Donkeys Farm is the exclusive distributor.
2. The promotion at selected pharmacies and specialty/organic shops is one of company's long-term goals.

- **Customer Segments**

1. Young children and elderly who suffer from several diseases.
2. Consumers with cow protein allergy.
3. Special interest tourists (Medical, cultural and agro- tourism)

- **Cost Structure**

1. The focus of value-driven cost structures is to create more value in the donkey milk products.

- **Revenue Streams**

Revenues of this company are derived from:

1. Donkey milk (pasteurized and freeze-dried form)
2. Cosmetics sales
3. Sales of other produced products
4. Revenues from farm entrance ticket
5. Restaurants sales
6. Sales of donkey ridings
7. Sales of other events

- **Competitor analysis**

The global dairy industry in general is characterized by intense competition, but in the case of donkey milk it is not easy to say that there is competition, as a very small

number of companies are active in this sector. Under the current conditions, the local competition is very low as the other companies have very limited number of donkeys and it is not expected to gain a large market share. As they are not licensed by the authorities.

#### Threat of new businesses entering:

1. The risk of new businesses entering in the industry of donkey milk is very low, given very low population of donkeys.
2. Specialized knowledge/experience for breeding milking donkeys is required.
3. Technology and equipment are expensive (especially for producing high quality milk powder).

#### Other small local enterprises offering almost similar services:

1. **Achna Lake Donkey Park:** A park which mainly offers donkey rides and kids playground services and thematic events.
2. **Camel Park in Mazotos village:** This theme park has been operating in the area for 23 years and is the only park in Cyprus that hosts camels. In addition to camel rides, the unit is active in the provision of a pool, a restaurant and playground services.
3. **Ostrich Park in Agios Ioannis Malountas in Nicosia and Flying Ostrich Park in Avgorou:** It is one of the largest ostrich farms in Europe and offers pony walks for young children.

#### • **Market trends**

In recent years, more and more consumers are interested about functional products. This interest creates new conditions in the wider environment of modern and innovative businesses. Most of those consumers are elderly, young children but also vulnerable populations. The company's products gradually attract huge interest from specific consumer groups, especially elderly and chronic patients. Also, the expansion of milk's production will allow the production of freeze-dried donkey milk powder and would be enhanced the potential for exports.

Also, in the last decade internationally, a large volume of the buying public has a great interest for alternative forms of tourism. The main features of alternative tourism are the search for authenticity and contact with nature, the rejection of impersonal tourist packages, the avoidance of overcrowded beaches, and the combination of holidays with the offer of voluntary work. All the above contribute to the protection of the environment and the promotion of the cultural heritage and at the same time, offer solutions to problems of tourist seasonality. It is considered a

small-scale development of tourism, which comes and it is organized mainly by the local population or local agencies and attracts tourists with special interests.

- **Evaluation of the potential market (market share)**

### **Political, Economic, Social, Technological Analysis**

#### **Political**

National and European regulations regarding production and pricing of dairy products.

#### **Economic**

In general, the dairy industry in Cyprus is an important part of the food industry, actively involving in the annual GDP. Also, there is a current trend about the increased demand for healthy food and functional products. However, the recent economic downturn increases risk and causes changes in the European framework with possible impact on this sector.

#### **Social**

Consumers' preferences vary due to the adoption of healthy eating patterns and lifestyle. Thus, an increase in demand for products of higher biological value is observed.

#### **Technological**

The company is collaborating with the local universities to achieve technological improvements regarding the donkey milk production. Also, it has suitable and expert personnel to follow the technological developments.

### **The bargaining power of the company's suppliers**

The identification of the best suppliers is a key element for the effective running of the whole project. The offered prices and the provided quality are factors that are taken into account, which determine the bargaining power of the participants.

### **The bargaining power of the company's customers**

Limited customer's bargaining power. Each customer buys a part of the offered services. On an overall level the best possible quality of services and products is provided to avoid any dissatisfaction.

### **The bargaining power of donkey's milk retailers**

The retailers of donkey's milk products are the stores that exist in the market. The bargaining power of retailers is limited as the target market is very specific without any relation to other dairy products.



## **SWOT ANALYSIS**

The SWOT analysis refers mainly to the idea of donkey milk production in Cyprus, where at the there is no real competition. SWOT analysis will highlight industry's strengths, weaknesses, opportunities, and threats. SWOT analysis findings will note the main industry's issues, support and substantiate the strategic directions.

### ***Strengths***

- Alternative and nutritious milk type with many healing properties
- Production ability for innovative and functional products
- Continuous increase in production and consumption
- Global trend for increase selling price
- Scientific documentation
- Global trend for healthy eating lifestyle
- Lower local prices than worldwide

### ***Weaknesses***

- Limited production
- High production cost
- More costly compared to other milk types
- Limited knowledge of local market according donkey milk and its properties
- Not in high demand (especially for local consumers)

### ***Opportunities***

- Extending production line with novel and functional products
- Cooperation possibilities with pharmaceutical and cosmetic industry
- Increase research interest about donkey milk and its properties
- European and local funding for new innovative businesses

### ***Threats***

- Loss of revenue from substitute products
- Change in consumer preferences
- Unstable customer expectations
- Deterioration of the economic conditions

### **Marketing mix (communication-promotion – distribution)**

## Marketing plan

**Product:** The production of donkey's milk has already established in the Cypriot market. The company's goal is to produce a safe, nutritious, and attractive product. This target will be achieved by an excellent production line including the production, treatment, packaging and retailing phase. Since market penetration is in the initial phase, a leaflet will be provided to inform consumers about the company, the product, and its properties.

**Price:** The wholesale price of donkey milk today is € 5 per 250 ml and the retail price is € 6 per 250ml. These prices are considered as lowest prices in Europe (existing prices: Belgium € 100 / liter and in Greece € 50 / 330ml).

**Promotion:** Digital marketing is considered as the best inexpensive method of promotion. It is one of the most important tools available to businesses, resulting in higher market share and increase profit. Advertising through social media through direct marketing is considered vital. Also, the company's participation at international exhibitions with a stand for tasting and distribution of printed material (brochures) is another effective promotional way.

**Place – Distribution:** The Marketing department will approach various Organic products shops and Pharmacies in order to open distribution channels to the consumers. The distribution will be done by multi-purpose, cooled van with the Golden Donkeys logo. Frequent lines will cover the whole island offering the consumer fresh and high-quality products. Additionally, direct delivery to consumers will be available. Distribution will be planned in order to daily cover the island's major cities.

## Product design

At the very beginning, the company had to overcome obstacles of legislative nature i.e. obtain a farm license from the local VET Services for milking donkeys. Quality control /Assurance is performed by experienced personnel and dairy lab equipped with the basic instrumentation is established on-site, as well as contracts for external laboratory services were signed. A commercial freeze-drier was commissioned and through vigorous trials / training and testing a high-quality final product (i.e. freeze-dried milk powder) was obtained.

## Production process

**Strategic Goals:** Golden donkeys farm aims to meet the local needs resulted from the rising demand for donkey milk. The main goal is to double donkey milk production within 2 years and then continues with steady increasing production. Also,

the farm is targeting to reach the 70% of the Cypriot market and the export expansion through the production of freeze-dried milk powder.

**Strategic choices:** The company, due to its small size, seeks exclusive partnerships to promote its products which will offer a competitive advantage. Golden Donkeys farm ensures that it always offers excellent quality products, while the overall marketing is purely customer centric.

At the moment Golden Donkeys Farm is producing bottled pasteurized donkey milk and pasteurized freeze-dried donkey milk powder. The donkey milk powder is used as an ingredient to other food products (i.e. chocolate, cookies, delights) and cosmetics (i.e. creams, soaps). The daily milk processing is up to 20L, therefore a small batch pasteurizer is employed, while the freeze drier's capacity is 12 L. Once dried the powder produced will be approximately 1Kg.

The company employs a food scientist who is responsible for the Quality Control and the smooth implementation of ISO 22000. Major restrictions at the very beginning were focused on licensing the premises and production line by local VET Services. Once, licensing was obtained and the Food Safety Management Systems were in-place, the problems faced were on correct usage of equipment (i.e. freeze-drying) and often raw material shortages (i.e. not enough milk).

## 5) Financial data

### • Assets

Assets	Year	Value (Euros)
Land/Farm/ Buildings	2019	1,186,554
Equipment	2019	87,860
Vehicles	2019	40,141
<b>Total</b>		<b>1,314,555</b>

• **Balance sheet**

	<b><u>2018</u></b>		<b><u>2019</u></b>
<b>Income</b>	1,110,892	<b>17,12%</b>	1,301,518
Cost of Sales	(778,339)	<b>9,33%</b>	(850,991)
<b>Gross Profit</b>	<b>332,553</b>	<b>35,48%</b>	<b>450,527</b>
Other Operating Income	20,870	<b>-17,87%</b>	17,142
Distribution and Sales Costs	(63,382)	<b>-14,45%</b>	(54,216)
Administrative expenses	(189,021)	<b>27,23%</b>	(240,494)
Other expenses	-		(3,790)
<b>Profit from Operations</b>	<b>101,020</b>	<b>67,46%</b>	<b>169,169</b>
Net Financing Cost	(11,923)	<b>-6,38%</b>	(11,158)
<b>Profit before Tax</b>	<b>89,097</b>	<b>77,34%</b>	<b>158,011</b>
Tax	(10,225)	<b>102,93%</b>	(20,763)
<b>Net Profit for the Year</b>	<b>78,872</b>	<b>74,02%</b>	<b>137,248</b>
<b>Other total Revenue</b>	-	-	-
<b>Total Revenue for the Year</b>	<b>78,872</b>	<b>74,02%</b>	<b>137,248</b>

### **The story so far:**

Donkey milk and donkey milk products are very important to the business. The % contribution to the farm is considerable and it adds to profitability.

Donkey milk and its products are innovative products aimed at specific consumer groups and due to limited availability (low production of raw material) may be considered expensive, for the average consumer.

Most of the products are consumed/used locally but few quantities of milk freeze-dried powder is also exported.

Additionally, there are some new products lined up (i.e. bioactive freeze-dried donkey milk powder, bioactive fermented donkey milk drink) that are a result of research projects between the university and the company.

At the same time, new technologies to be used in the processing lines are currently under discussion.

### **6) Keywords, main training competences and skills**

#### **Keywords**

- Donkey milk, donkey milk powder, donkey milk products, bioactivity, freeze-drying

#### **Main training competences**

- To grasp opportunities and create solutions.
- To realize the importance of innovation.
- To understand consumer needs.
- To organize market opportunities into business plans.
- To build a mindset of networking and collaborating.
- To highlight the importance and the role of university/research centers (and other) partners from other disciplines.
- To consider the important role of strong communication of the idea.

#### **Questions for reflections/self-reflections**

- Where do ideas originate from?
- How important is to collaborate with a research institution? Are there any benefits for both organizations?
- SWOT analysis and the project. How important is it for decision making?
- What was the learning process?

## 2.5. Industrias Lácteas Manzano S.A. (Manzer)

### Company presentation

<b>Country / City</b>	Spain / León
<b>Products</b>	Cheese
<b>Legal form</b>	Anonymous Society
<b>Year of foundation</b>	1930
<b>Number of employees</b>	40
<b>Market (target customers)</b>	General population. Suitable for gluten intolerant. Not suitable for those allergic to milk and eggs and lactose intolerant.
<b>Exports (% of turnover)</b>	0%
<b>Main competitors</b>	All cheese factories.
<b>Turnover (optional)</b>	9.000.000 €
<b>Type of company (start-up, spin-off, established) at the time of the innovation</b>	Established <a href="https://quesosmanzer.es/">https://quesosmanzer.es/</a>
<b>If a startup – education and work history of the entrepreneurial team</b>	



## 1) Brief description of the sector and the sub-sector in the country

In Spain, the cheese market is around 375,000 tons, with a value of € 2,630 million, and almost half of the production (more than two thirds in the case of micro SMEs) corresponds to hard or semi-hard pressed pasta cheeses. In terms of consumption, the average economic value of pressed pasta sales exceeds € 1,000 million. Due to the characteristics of the cheese sector, producing and marketing companies in our country (few groups with large production volumes, large atomization, semi/artisan operators, losses due to microbiological alterations can have a catastrophic impact. Only defects due to fungal contamination in hard pasta and with an average value of 7 €/kg, would represent an economic impact of more than 70 million €, more than 3% of the total value of national cheeses, in addition of the costs of removing the damaged product and the damage to the image of the brand, both difficult to estimate. The collaboration between the industry and ULe would have a direct economic impact, minimizing economic losses and facilitating exports to countries that prohibit the use of some additives.

## 2) Short description of the case

One of the main problems cheese industry has to deal with is the growth of fungi during ripening. The SAMA research group (Food Safety and Food Microbiology) of the University of León (ULe) has been doing research on this field, and specifically, on food mycology (TM López-Díaz et al.) for many years. To date, we know that *Penicillium* is the main responsible of this problem. It may grow in the surface of cheeses (such as Castellano type cheese, the main cheese variety in Castilla and León region) during ripening causing spoilage. In addition, this fungal growth is not desirable, since these species are, most of them, toxigenic.

**IND. LÁCTEAS MANZANO SA** required advice in the prevention of these fungi and contacted ULe some years ago. Due to this collaboration, the cheese production was improved and this spoilage was diminished by the use of specific antifungal treatments. Nevertheless, these treatments are chemical, their use is not allowed in all the countries, consumers prefer the use of natural additives and, therefore, biopreservation is under focus among the research departments as a possible tool. Professor López-Díaz is at present in charge of a research project dealing with the use of lactic-acid bacteria with antifungal properties as protective starters. This project is in the last stage and the results will be transferred to the industry very soon.

### The idea

We present a case of improvement of the product (Castellano cheese) made by an established company (**INDUSTRIAS LÁCTEAS MANZANO S.A.**). The aim was to solve a technical problem which cause economical loses to the industry.

### 3) Origins

- \* Was the idea an initial entrepreneurial idea for a start-up? No.
- \* Was it an idea in the usual preparation of innovative products portfolio of an established company? No.
- \* Was it a lab-idea that caused a spin-off? Yes
- \* Was it market-driven? No.

#### The type of collaboration:

**INDUSTRIAS LÁCTEAS MANZANO S.A.** required advice in the prevention of this problem and contacted ULe. In addition, the SAMA group (SAMA-ULe) was interested in this problem, and has experience, with several publications on the field. As a result of this interest, the SAMA group participates in a research group in collaboration with the INIA (National Institute of Agricultural and Food Research and Technology, financing entity, reference RTA2015-00018-C03-03) and University of Castilla-La Mancha (financed by INIA) to develop lactic acid bacteria (LAB) protective cultures with antifungal activity. **INDUSTRIAS LÁCTEAS MANZANO S.A.** is one of the cheese industries collaborating in the project.

#### The innovation

As mentioned above, we present a case of improvement of a product, consisting on the prevention of mould growth on the surface of the cheese during ripening by the use of specific antifungal treatment and of LAB protective cultures designed by SAMA-ULe.

### 4) Business-plan.

**Key partners:** the U. of León is collaborating with **INDUSTRIAS LÁCTEAS MANZANO S.A.**

**Key activities:** try-and-error processes, production line adjustments.

**Key resources:** raw material by a number of sheep milk suppliers, and additives, natural or artificial. For the production of Castellano cheese improved, no equipment was bought and no investment in terms of machines was made. Only the type of antifungal additives was adjusted following the academy suggestions. In addition, several trials using the adjunct starter *Lactobacillus paracasei* 25/1 were made (part in the industry, part in the pilot plant of the Veterinary Faculty, U. of León).

**Value proposition:** the improved product would reduce economical losses for the cheese industry. Fungi are important spoilage agents.

**Customer segments:** retail and the big super markets are the main markets. The product addresses any kind of consumers.

**Customers and customer Relations:** since this case study is not about a new product, but an improved product, this is not applicable.

**Channels:** since this case study is not about a new product, but an improved product, this is not applicable.

**Market analysis:** the production of this type of cheese (both: mixed cheese and pure sheep cheese) is approximately 1,5 million kg per year. This is not a case of design of a new product, but improvement of an existing product.

The industry has not performed a quantitative analysis of the economical losses due to this technical problem, but estimates them as significant, according to the general indicators mentioned before. This problem causes a loss of quality of the product. The presence of the fungi may originate flavor defects in the final product. In addition, according to the literature and our own experiments, these fungi should be prevented due to possible sanitary consequences. It also increases the production costs, because the brushing of the surfaces of the cheese is necessary to eliminate the fungus and is made manually and periodically.

#### **SWOT analysis:**

- **Strengths:** Solving a current quality (sanitary) problem/reducing costs/training researchers.
- **Weaknesses:** Difficulties to scale the starter/High costs/Patent process (time consuming).
- **Opportunities:** New protective starter offer for the cheese industry.
- **Threats:** Not getting to design the culture/Not getting a patent.

**Quality Control:** The industry has a quality policy and has achieved different quality certifications such as ISO 9001:2015.

Apart from the common analysis carried out in any cheese production (pH, main microbiological groups, fat, protein, etc.), in the case of the protective starter trials (with *Lactobacillus paracasei* 25/1), cheeses were inoculated with a strain of *Penicillium commune* previously isolated and identified by the university partner. During manufacturing, counts of lactic acid bacteria and pH was performed, and the control of the fungi growth on the surface was estimated by taking photographs at different steps. Thus, the effect of the starter on the inhibition of the fungal growth could be demonstrated. The use of different combinations of antifungal additives was also assessed by visual observation of the fungal growth.

**Production process. Restrictions of the product development.** One restriction to finish the development of the cultures is technical: it is not possible to inoculate the cheese with the fungi in the industry, due to the contamination this would produce. Therefore, the pilot fabrications have to be made in the University. The COVID-19 pandemic is also restricting in some way the finalization of the project.

## 5) Financial data – financing, types of funding

The company uses different financing methods: own resources and foreign financing.

### The story so far:

The industry improved the production of Castellano cheese by the adjustment of the antifungal additives. As for the use of protective adjunct starters, the research Project dealing with the design of a LAB culture with antifungal properties started in 2017 and is finishing this year. To the date, a selection of two LAB (*Lactobacillus casei* Lc-51/3 and *L. paracasei* Lp-25/1) has been made, from a pool of many LAB isolated from milk. One of them, *L. paracasei* Lp-25/1 has been proved in cheeses made in the industry with good results as for the inhibition of the fungi (a number of fungi have been isolated from cheese and identified using the last techniques, in addition to the LAB identification). We are at present finishing some tests to further characterize the cultures, and the idea for the next future is to make the last pilot productions (in the industry or in the University) to assess the benefits of its use and determine the parameters for the scaling of the cultures to the industry. The project is concluding. In this last stage, we will contact with one of the collaborating companies dedicated to the production of cultures.

## 6) Keywords, main training competences and skills

### Keywords, main training competences

Cheese control/cheese spoilage/cheese protective cultures.

### Main training competences

- To understand the need for the dairy industry of creating solutions through the interchange of competences/knowledge between industry and academia.
- To highlight the importance and the role of university to help to reduce economical losses associated to the quality of the product.
- To encourage the relationships between the production/quality/design and development/research departments with the research groups of the universities.
- To find several of the tools described in the lab manual, which are necessary in attending the dairy industry needs.

### Questions for reflections/self-reflections

- Is it easy the transference of knowledge and skills from the University to the dairy industry?
- Where do ideas of collaboration come from?
- Why did IND. LÁCTEAS MANZANO collaborate with ULe in this case?
- Which are the chances of a complete transference of findings to the industry?
- Which are the factors that could make transference of research findings to dairy industry to fail?
- How can we (dairy industry-academia) increase the possibilities of success?



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