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SECTORAL STUDY

The Dairy Sector in Greece: Constraints and Opportunities for Existing Producers and Newcomers

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The Dairy Sector in Greece:
Constraints and Opportunities for Existing Producers and
Newcomers



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The Dairy Sector in Greece:
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Newcomers

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Summary

The aim of the present study was to shed light to constraints and opportunities for existing producers and newcomers in the dairy sector in Greece. Towards this, we used existing relevant studies as well as existing market data about the current status and the potential of the dairy sector both at national and EU level. Additionally, we designed and completed questionnaires in order to fingerprint the views and willingness of existing producers but also newcomers to expand and invest, as well as questionnaires regarding consumer's trends towards existing and novel dairy products. We thus collected material, which include a detailed fingerprint of the current status in the Greek dairy sector and its expanding potential, a detailed fingerprint of the small, family dairy units as well as their know-how and capacity. Moreover, we evaluated the potential of small dairy units to further develop (Business Plan I) and we developed guideline procedures for newcomers for setting-up new businesses in the dairy sector (Business Plan II).

Executive Summary

Greece has a long tradition in small ruminant farming, i.e. sheep and goat, and thus sheep and goat milk production as a whole makes almost 60% of the total milk production while the remaining 40% is cow milk. The sheep and goat livestock extends to 9.5 million sheep and 4.5 million goats, compared to just 154.000 dairy cows. Primary milk production, for all types of milk, is mainly concentrated in Central Macedonia and Thessaly. The major part (90%) of sheep and goat milk produced in Greece is used for cheese making, while, the main part of cow milk (80%) is used mainly as pasteurized milk and yogurt.

Nearly 80% of sheep and goat milk derives from small and family farms, which are highly dependent on family labour, with almost 115.000 families engaged in farming and over 300.000 people working part- or full time in the primary dairy sector. The secondary dairy sector, i.e. milk processing, comprises 53 big dairy companies processing >5000 tons of milk per year and 671 SMEs or family dairy units processing <5000 tons of milk per year. They process all types of milk produced in Greece, namely 730.589 tons of cow milk, 735.669 of sheep milk, 350.871 tons of goat milk (data of 2013) into a big variety of products, with the major ones being drinking milk, yogurt and cheese. The secondary dairy sector provides work to a total of 11.802 employees.

Regarding import and export trade of dairy products, total imports (in quantity) showed an upward trend between 2008 and 2010, followed by a slight decline till 2013, with cheese ranking by far first. On the other hand, exports (in quantity) showed fluctuations between 2008 and 2013, with cheese and yogurt being the protagonists, showing at the same time an upward trend.

The family expenditure share for milk and dairy products, within the food expenditure as a whole, has remained almost stable over the last years, fact that reflects the important position of dairy products in the dietary habits of the Greeks. Regarding milk, most consumers prefer pasteurized milk while high-temperature pasteurized milk comes second, claiming at the same time an increasing market share. The consumers' preference in yogurt mainly refers to strained yogurt and in particular yogurt from cow milk. With regards to cheeses, the category of soft cheeses, which includes basically Feta cheese, ranks by far first in consumers' preferences, followed by hard and semi-hard cheeses, while at the same time imported hard and semi-hard cheeses are becoming also popular, mainly because of their lower prices. Still, the majority of the consumers choose Greek traditional and PDO cheeses. It should be mentioned that Greece has worldwide the highest per capita cheese consumption with almost 30 kg annually.

Joint concerns among all stakeholders of the dairy sector, i.e. farmers, dairy companies, consumers, state authorities and investors, include further development of the dairy sector, reduction of production costs and consumers' prices, improving products' quality, emphasis on Greek traditional dairy products, extroversion, unemployment decline and sustainability.

Agrotourism has not developed sufficiently in the dairy sector despite the considerable efforts made so far both by the tourism entrepreneurs and the relevant public authorities. The "Greek Breakfast" initiative and the Baron Michael Tossizza - Averoff Foundation Dairy unit are excellent but sporadic examples. Thus agrotourism has to be considered on a more sustainable basis and in an integrated approach at national level.

The same is valid for the implementation of e-commerce in the dairy sector, despite the fact that e-commerce, as a whole, is emerging in recent years as a growing trend mainly among consumers and in lesser degree among Greek entrepreneurs. Dairy units, no matter big or small, should seriously consider e-commerce as a tool for better promoting their products and developing their business.

Stable economic and legislation environment along with faster and more efficient state administrative procedures as well as integrated and well-coordinated educational curricula for newcomers are considered as crucial prerequisites for giving vent and prospective to the emerging tendency, especially among young people, to re-visit the agro-food sector in Greece and in particular dairy farming and dairy processing.

To conclude, the comparative advantages for the “small” dairy “garden” of Greece, which can and should act as the main levers of the Greek dairy sector as a whole are (a) the goat milk, a unique product of high quality and quantity, especially the one produced by autochthonous breeds under extensive and not intensive conditions, and (b) the indigenous microbiota of the naturally fermented Greek dairy products, which is well preserved in the Agricultural University of Athens.

Chapter 1. The dairy sector in Greece: current status

1.1. Introduction

The EU has as highly developed dairy sector that significantly contributes in the global production of cow (25%), goat (18.6%) and sheep (18.4%) milk. At EU level, cow milk is the dominant one (97%). The current oversupply of cow milk on the world market has driven prices for milk low. The average milk price in EU fell by 19% from September 2014 to September 2015, with increased production (EC, Milk Market Observatory 2015), while the prospects for price rising are cloudy, among others, because of the world political insecurity. In particular, the EU cheese exports declined by 26% from January to Aug 2015 and at the same time prices have been forced down, largely due to the Russian import restrictions and China's import deceleration in skim milk powder by 26% during the first semester of 2015 (Eurostat ComExt, 2015). However, despite the apparent uncertainty in the global dairy trade, some North European countries have invested to the EU quotas regime elimination since April 2015 in order to increase milk production taking advantage of the rainy climate and vast pastures. It is beyond doubt that there is a business conflict of interest (a) between EU enterprises, with huge milk surpluses that are likely to increase after 2015 and domestic national ones to capture shares in the milk market and (b) between dairy enterprises and retail chains, with a view on the part of supermarket dominance in the production and marketing of milk through private label products (European Commission Conference, 2013).

On the other hand, Greece has a long tradition in small ruminant farming, i.e. sheep and goat, and thus sheep and goat milk production as a whole makes almost 60% of the total milk production while the remaining 40% is cow milk. The sheep and goat livestock extends to 9.5 million sheep, i.e. 12% of the EU total number, and 4.5 million goats, i.e. 48% of the EU total number, compared to just 154.000 dairy cows, i.e. 0.6% of the EU total number. Dairy activities in Greece, especially those related to small ruminant's milk, have been traditionally vital to the rural and the national economy as a whole, with almost 115.000 families engaged in farming and over 300.000 people working part- or full time in the primary dairy sector, i.e. raw milk production. Thus, despite the low contribution of Greece in cow milk production at EU level, Greece is ranking 2nd at sheep and goat (as a whole) milk production in the EU, being at the same time 4th and 5th at world level, respectively, and ranking 1st worldwide in the per capita production of sheep and goat (as whole) milk. The major part (90%) of sheep and goat milk produced in Greece is used for cheese making, with 21 cheeses having been recognized as PDO (Protected

Designations of Origin), which is the highest number of PDO cheeses in the EU. Nearly 80% of sheep and goat milk derives from small and family farms with an average herd size less than 100 animals. These farms are highly dependent on family labour and usually lack mechanised milking systems, despite the reform efforts of recent years. Still, sheep and goat breeding in Greece ensures income in mountainous and less favored areas where alternative income sources are rather limited.

Regarding cow milk production in Greece, the major part (80%) is used for bottling, mainly as pasteurized milk, and the rest in yogurt production. However, there is a high deficit given that only 730.589 tons in 2013 while the domestic needs reached 1.3 million tons for drinking milk as well as dairy products, mainly yogurt. Despite the EU limitations quotas regime in cow milk production, Greece had never exceeded its own quotas. On the contrary, there was a shrinkage in milk production sector with the cow breeders going down from 12.400 in 2000 to 3.680 in 2013. Meanwhile, in April 2015 the quotas regime has been abolished, with international analysts being concerned about the impact of the non-quotas regime on producer prices in the EU, with Greece asking for further support and control measures by public interventions and at the same time reconsidering the role of cooperatives and producer groups so as to better meet the new conditions.

The secondary dairy sector, i.e. milk processing, in Greece is well developed. It comprises of 53 big dairy companies processing >5000 tons of milk per year and 671 SMEs or family dairy units processing <5000 tons of milk per year. They process all types of milk produced in Greece, namely 730.589 tons of cow milk, 735.669 of sheep milk, 350.871 tons of goat milk (production data for 2013) into a big variety of products, with the major ones being drinking milk, yogurt and cheese. In particular, the processing of sheep and goat milk, which can be considered as the competitive advantage of the Greek dairy sector, is mainly in the hands of SMEs and family dairy units. The dairy sector provides work to a total of 11.802 employees and makes 17,3% in production value of the food sector as a whole, which in turn makes in value almost 1% of the Greek economy (GDP) from a total of 3.3% of the whole rural sector's participation to the GDP.

Thus, under the current conditions, the Greek dairy sector has become vulnerable to international competition. Importing nations have set high quality standards which have to be necessarily met by the exporting nations. The success of the Greek dairy industry now depends on the production of milk of high quality to be converted to value added products, mainly traditional and PDO cheeses. The critical point here is the need for proper infrastructure to help maintaining the requested hygiene and the quality of milk and milk products. Taking the above into account, the Greek dairy sector must be re-visited in a sustainable perspective so as to be able to offer products of high added value and competitiveness and also exploit its comparative advantages in milk production.

1.2. The dairy sector at global and European level: prospects

The dairy sector is of great importance to the EU and milk represents a significant part (15%) of the EU agricultural output value. The EU main producers are Germany, France, the United Kingdom, Poland, the Netherlands and Italy, which together account for almost 70% of the EU production. Moreover, the EU plays a key role in the world dairy market as the leading exporter of many dairy products, mainly cheese.

The medium-term prospects for milk and dairy commodities are promising mainly due to the growth, at a steady pace, of the demand worldwide. Milk production is expected to increase in all the main milk-producing regions of the world, including the EU. From 2016 onwards, milk deliveries in EU are expected to show a steady increase but at a pace slower than before the abolition of the quota. Specifically, 158 million tons are expected to be produced in 2024 i.e. 12 million tons more than 2014. The European milk deliveries are expected to grow at a rate of 0,8% per year.

A higher consumption of dairy products is expected in several regions, such as India, China, Africa and the Middle East, primarily due to changes in dietary habits and also to population growth. However, this significant increase in consumption of dairy products does not necessarily mean that these regions are going to increase imports, as the level of their domestic production

will be higher and therefore, they are expected to keep imports steady. Overall, a 2% annual growth in world imports is expected. Regarding China, it is expected to remain first in dairy products imports and this will account for 20% of the world imports by 2024.

Regarding cheese production, it is anticipated that in the EU it will reach by 2024 11 million tons, which is 1,15 million tons more than in 2014, and from this quantity only 350.000 tons are expected to be exported. Overall, the EU cheese exports could reach in 2024 approximately 1 million tons and could constitute 40% of the cheese world trade. As a result of the large amounts of cheese being produced, EU is the world main producer of whey powder (WP). Its production is expected to increase by 20%, reaching 2.5 million tons in 2024. The EU enjoys a strong position in world trade as the amount of WP traded worldwide is up to 60%.

Over half of the EU dairy products traded are in the form of powders, as they offer the easiest and cheapest way of transporting milk. Skimmed Milk Powder (SMP) production is expected to reach 1.6 million tons by 2024. The EU exports approximately 50% of SMP produced and accounts for more than 30% of the world trade. In 2014, production volumes of Whole Milk Powder (WMP) and exports were increased, after five years of continuous decline. A further slight production increase is expected over the outlook up to 840.000 tons in 2024.

By 2024, butter production is expected to increase by 9% compared to 2014. However, the EU is not competitive in this sector on the world market, so export potential is generally limited. Most of the additional production will be absorbed domestically.

With regards to fresh dairy products, such as drinking milk and yogurt, their production stagnated during the last decade. However, an increase of 3% in production is expected over the next 10 years, mainly due to dynamic exports and the increase in consumption of cream as well. Yogurt consumption could rise noticeably in the EU-N13 EU, Member States which joined in 2004 or later, where it is, currently, still at relatively low levels.

The per capita intake of liquid milk has declined in recent years. However, population growth will limit the fall in total consumption. In 2013, China absorbed 120.000 tons of EU liquid milk, i.e. more than 20 % of EU exports. It appears that China could be a long-term market opportunity, and that demand may even strengthen. By 2024, EU exports of fresh dairy products could reach 1.6 million tons, which would represent around 3% of EU production (European Commission, 2014).

Despite the above encouraging forecasts for the global dairy trade, the international demand on milk products during 2014 and the first semester of 2015 decreased due to the import ban in Russia and China. The world milk price fell below 0.30 USD (i.e. 0.26 euro)/ per kg of milk (June 2015). This affects the milk production worldwide. Additionally, the EU quota system abolition has pushed milk supply despite the current low prices. Prices are expected to enter a recovery phase in late 2015/early 2016 (IFCN, 2015).

1.3. Domestic dairy market

Milk production, at European level, refers, mainly, to cow milk production. However, in Greece things are quite different as the production of sheep and goat milk makes almost 60% of the total milk production while the remaining 40% is cow milk. Interestingly, the majority of the goat milk produced in Greece is used, blended with sheep milk, for the production of most PDO Greek cheeses. At the same time, Greek goat milk is being systematically exported and most importantly in an un-controlled way to France for the production of French PDO goat milk cheeses. This is not surprising at all. France has since decades understood the nutritional and technological superiority of goat milk for cheese production. More than 30% of the French PDO cheeses are produced exclusively from goat milk, no matter French origin or not. Unfortunately, this is not the case for the Greek dairy sector, despite the quantity and quality of the goat milk produced in this country.

Greeks hold first place in the per capita consumption of cheese worldwide. In particular, Feta plays an important role in the Greek diet and it is linked with the significant domestic

production of goat and sheep milk. Moreover, one important aspect of sheep and goat farming is that it ensures income to people in mountainous and disadvantaged areas, where alternative sources of income are needed (<https://mahitotekmirio.wordpress.com/>).

Along with Feta cheese, Greek yogurt is the 2nd flagship of the Greek dairy sector. Moreover, “Greek Yogurt”, i.e. strained yogurt prepared from cow milk, is dynamically emerging around the globe in recent years. In this sense, Greek yogurt deserves a deeper look about its nutritional and economic value, i.e. a challenge for the growth of the Greek dairy sector. At this point it should be mentioned that since 2013, “wild” lactic acid bacterial strains isolated from naturally fermented Greek dairy products and belonging to the ACA-DC Collection (<http://www.aca-dc.gr/>) of the Laboratory of Dairy Research at the Agricultural University of Athens, are being commercialized all over the world for the production of Greek Yogurt, both in Greece and abroad. This indigenous treasure of the traditional Greek dairy products along with the Greek goat milk can and should act as the levers of the dairy sector of this country in the near, and not only, future.

The dairy sector is highly ranked in the domestic food market and it includes some of the country’s largest food industries. Interestingly, however, a significant number of small and medium-size dairy units, which are mainly dedicated to cheese production, are also operating. These units operate at a limited scale covering mainly the needs of the local markets. On the contrary, large industries have modern facilities, organized distribution network and offer a wider variety of products. These companies represent a large share of the milk market almost throughout the country. The dairy industry is complemented by a remarkable number of companies that import dairy products. Moreover, some production companies are also importing dairy products so as to enrich the range of the products being offered.

1.3.1. Size of domestic dairy production

The most recent data available about the economic volume and value of Greek food sector date back to 2009 (Thomaidou, 2014). According to this, the Greek food industry covers 18,9% (EU average 12,3%) of all enterprises in the processing sector and ranks 1st among all processing industries. At the same time, it employs 20,3% (EU average 13,5%) of all employees in the processing sector, ranking again 1st among all processing industries. Moreover, food industry ranks 1st in terms of production value, namely 20,4% (EU average 13,8%), and Gross Value Added (GVA), namely 19,7% (EU average 11,3%), and 2nd in terms of turnover, namely 20,2% (EU average 13,5%), among all processing industries (Thomaidou, 2014). The milk processing enterprises, which comprise 5,2% of all food industries, employs 14,5% (11.802 employees) of the food industry’s total workforce (81.392 employees). Correspondingly, the milk processing sector, in relation to the food industry as a whole, accounts for 17,3% of the production value (1.770 million euro), the 15,5% of the GVA (516 million euro) and the 20% of the turnover (2.217 million euro). Furthermore, in the milk processing sector, the labor productivity (GVA per employee) is 51,2 euro, the labor cost is 30 euro per employee and the investment costs 11 euro per employee (Thomaidou, 2014).

1.3.1.1. Raw milk

Total primary production of all types of milk has, in recent years, a small downward trend. Indeed, as shown in Table 1.1, the quantities of cow and goat milk decreases from 2008 onwards, with the exception of 2012 for cow milk and 2013 for goat milk. On the contrary, the production of sheep milk is growing, surpassing in 2013 even the production of cow milk. It is worth mentioning that although the production of cow milk is higher than the production of sheep or goat milk separately, the quantities of the latter two types of milk together exceeded by far cow milk production, fact that demonstrates their significant contribution to the dairy sector in Greece.

Table 1.1. Domestic production of milk by type of milk (2008-2013)
(in tons; ICAP, 2014)

Year	Cow milk	Sheep milk	Goat milk	Total
2008	787.222	692.394	412.086	1.891.702
2009	755.279	724.843	411.695	1.891.817
2010	759.595	728.625	390.681	1.878.901
2011	752.403	739.557	369.777	1.861.737
2012	765.451	721.029	347.362	1.833.842
2013	730.589	735.669	350.871	1.817.129

Table 1.2. Incoming cow, sheep and goat milk (2008-2014)
(in tons; ELOGAK, 2015)

Year	Cow milk	Sheep milk	Goat milk	Total
2008	705.201	514.056	149.617	1.368.874
2009	685.000	546.693	156.756	1.388.449
2010	673.901	569.336	154.843	1.398.080
2011	641.767	539.120	135.519	1.316.406
2012	639.129	514.641	118.131	1.271.901
2013	608.533	538.627	125.731	1.272.891
2014	616.753	560.428	131.487	1.308.668

In Table 1.2, the evolution of incoming cow, sheep and goat milk is imprinted. At this point it should be mentioned that as incoming milk is considered the quantity of milk delivered in the processing units. The quantities of all types of milk and, hence, the total production, fluctuated between 2008 and 2014. However, in 2014 the total production was the highest during the last three years, reaching 1.308.668 tons.

1.3.1.2. Drinking milk

High-temperature pasteurized milk is the main competitive product of pasteurized milk. This fact is reflected in Table 1.3 as it appears that the production of pasteurized milk is decreasing continuously since 2010 while high-temperature pasteurized milk has an upward trend from 2008 to 2012.

Table 1.3. Total domestic production of pasteurized milk, high- temperature pasteurized milk, UHT (Ultra High Pasteurized) milk, condensed milk and various milk drinks (2008-2014) (in tons; ICAP, 2014)

Year	Pasteurized milk	High-temperature pasteurized milk	UHT milk	Condensed milk	Various milk drinks
2008	338.984	116.335	2.800	23.467	57.649
2009	340.679	126.004	3.000	22.570	52.101
2010	336.069	125.225	4.300	21.255	45.827
2011	329.855	138.139	5.000	20.456	38.051
2012	324.106	164.309	4.900	11.508	54.215
2013	284.156	157.262	5.500	8.138	49.652
2014 (forecast)	295.000	146.000	5.000	7.000	46.000

The temporal decrease in production of pasteurized milk is mainly associated with the parallel increase of high-temperature pasteurized milk, which is easier to distribute, store and manage due to longer shelf life, i.e. can be stored in the freeze not open for 21-40 days or 4 days after opening. It is worth mentioning that a relatively small number of large-size companies are involved in the production of pasteurized milk as the costs of transportation and delivery are high, due to short shelf-life. Hence, the small production units serve mainly the local market of the region where they operate.

The production volume of UHT (Ultra High Pasteurized) milk is very low compared to other categories of milk. It is kept at room temperature for a long time. This specific type of milk is used mostly by various professionals, e.g. restaurants, hotels etc. Domestic production in recent years ranged between 5.000-5.500 tons (Table 1.3). Regarding condensed milk, the total domestic production declined in recent years, recording significant drop from 2012 onwards. Moreover, the production of various milk drinks, such as chocolate milk and milk with coffee or strawberry flavor, showed fluctuations in recent years.

1.3.1.3. Yogurt, butter, cream and sour milk

Yogurt has a significant position in the Greek dairy industry. It ranks first in exports of the Greek dairy industry. However, as Table 1.4 presents the domestic production of yogurt showed a gradual decline from 2008 to 2010. The next two years, namely 2011-2012, production stagnated close to 95.000 tons. Interestingly, in 2013, signs of recovery appeared and the production volume amounted 98.100 tons.

Table 1.4. Domestic production of industrial yogurt, butter, cream and sour milk from 2008 to 2014 (in tons; ICAP, 2014)

Year	Industrial yogurt	Butter	Cream	Sour milk
2008	102.289	1.200	8.400	7.679
2009	97.147	1.106	8.500	6.555
2010	95.307	1.093	8.500	6.628
2011	95.868	1.014	8.300	6.216
2012	95.648	1.341	9.300	6.208
2013	98.109	1.132	10.000	5.072
2014 (forecast)	102.000	1.200	10.500	4.500

Butter, from cow or sheep and goat milk, is produced in many dairy and cheese units, most of which have low production capacity. The volume of domestic butter production ranged,

approximately, between 1.100 and 1.300 tons from 2008 to 2013 (Table 1.4). In 2013, total production reached 1.132 tons.

A significant part of the domestic cream production is concentrated in small and medium-size units and farms. It is consumed mainly as an intermediate material, e.g. confectionary, cooking, in restaurants, confectionaries etc. Table 1.5 shows cream production from 2008 to 2014. The last two years, the amounts of cream produced, increased, reaching 10.500 tons in 2013. Regarding sour milk, its production continuously declined since 2008. In 2013, decreased by 18,3% reaching 4.500 tons.

1.3.1.4. Cheese

Total domestic cheese production had an upward trend from 2008 to 2010, reaching 286.083 tons in 2010 (Table 1.5). In 2011, the volume of production was at 272.172 tons, decreasing by 4.8% compared to 2010, while in 2012, a slight increase of 2,5% was observed. The share of dairy family farms in total cheese production was around 30-31%. Correspondingly, the share of industrial enterprises was 69-70%.

Table1.5. Domestic cheese production from industrial enterprises and dairy family farms (2008-2013) (in tons; ICAP, 2014)

Year	Industrial enterprises	Dairy family farms	Total	Change (%)
2008	186.189	79.000	265.189	3,79
2009	195.294	73.800	269.094	1,47
2010	207.883	78.200	286.083	6,31
2011	188.874	83.300	272.174	-4,86
2012	195.046	84.000	279.046	2,52
2013 (forecast)	190.000	85.000	275.000	-1,45

Moreover, in recent years, the share of industrial enterprises in total cheese production has increased. This is attributed to the increase both in the degree of industrialization in the dairy sector and the production capacity of the enterprises. However, it is worth noting that in Greece the share of the dairy family farms in the total domestic production of cheese is higher compared to other European countries (<http://ec.europa.eu/eurostat>).

1.3.2. Size of domestic dairy market

1.3.2.1. Drinking milk

Pasteurized cow milk is the most important category both in terms of quantity and value. Domestic production of fresh pasteurized cow milk covers the needs of Greek market, while imports and exports are limited. Pasteurized milk production, and respectively the domestic consumption, is reducing continuously since 2010, as mentioned previously (Table 1.3). In 2012, the domestic production reached 324.106 tons, while in 2013 decreased even more amounting 284.156 tons. According to market estimates, the largest part of total sales of pasteurized milk is performed *via* supermarkets, while small points of sale, such as neighborhood dairies, participate with a valuable percentage, about 25-30%. The value, in wholesale prices, of pasteurized milk was estimated at 285 million euro for 2013.

High-temperature pasteurized milk has higher profit margins, since its technical characteristics allow more appropriate planning of stores supplies. Moreover, the distribution

chain management is less costly. Domestic consumption of high-temperature pasteurized milk increased between 2008 and 2011. In 2013, the quantities consumed amounted 255.000 tons (Table 1.6). The value, in wholesale prices, of high-temperature pasteurized milk market was estimated at 280 million euro for 2013.

Table 1.6. Domestic high-temperature pasteurized milk market (2008-2014) (in tons; ICAP 2014)

Year	Consumption
2008	235.200
2009	248.300
2010	255.000
2011	260.000
2012	240.000
2013	255.000
2014 (forecast)	248.000

Despite the dynamic growth of domestic production of high-temperature pasteurized milk, an important part of the marketed quantity is imported. Moreover, it should be mentioned that in recent years, private label products have a strong presence in this category of milk with a continuously growing market share. Some of them are produced abroad on behalf of super-market chains. The share of private label products is estimated, in retail market, around 20-25%.

Regarding UHT milk, consumption shows fluctuations since 2008 (Table 1.7), amounting 22.600 tons in 2013. Most of the domestic demand relates to the professional use, about 2/3, while the rest is traded through retail stores for domestic use. Moreover, domestic demand for UHT milk is covered, mainly, by imports. The degree of import penetration is formed, overtime, in high levels, reaching 77-80% over the last two years. The value of this market is estimated to have reached the level of 21 million euro at wholesale prices in 2013.

Table 1.7. Domestic UHT milk market (2008-2014)
(in tons; ICAP 2014)

Year	Production	Imports	Exports	Apparent consumption
2008	2.800	20.990	83	23.707
2009	3.000	21.500	300	24.200
2010	4.300	25.000	500	28.800
2011	5.000	21.000	400	25.600
2012	4.900	19.000	350	23.550
2013	5.500	17.500	400	22.600
2014 (forecast)	5.000	17.000	350	21.650

The total domestic market of condensed milk is presented in Table 1.8. In particular, this category includes evaporated and sweetened milk, which is consumed in very small quantities, and it is mainly imported. The significant reduction that is observed in the size of the apparent consumption since 2011 comes mainly from the decrease in the professional consumption, e.g. confectioneries, cafes, as the consumption in retail, i.e. supermarkets, does not present variations on annual basis. In 2013, the value of condensed milk market, in wholesale prices, is estimated

that reached 200 million euro, including the quantities available at retail, i.e. super markets, and those distributed to caterers.

Table 1.8. Domestic condensed milk market (2008-2014)
(in tons; ICAP, 2014)

Year	Production	Imports	Exports	Apparent consumption
2008	23.467	100.363	1.961	121.869
2009	22.570	99.004	1.686	119.888
2010	21.255	110.000 ¹	1.140	130.115
2011	20.456	126.000	1.280	145.176
2012	11.508	120.000	1.400	130.108
2013	8.138	94.500	1.100	101.538
2014 (forecast)	7.000	94.000	1.000	100.000

1.3.2.2. Yogurt, butter, cream and sour milk

Total domestic yogurt consumption has shown downward trend in recent years (Table 1.9). In 2013, yogurt consumption was estimated at 80.000 tons, i.e. -3,8% compared to 2012. Domestic production covers the largest part of the demand. According to estimates, the share of private label product in retail market (traded through super-markets chains) is notable and estimated at around 13-15%. The value in wholesale prices of domestic yogurt market is estimated at approximately 220 million euro in 2013.

Table 1.9. Domestic yogurt market (2008-2014) (in tons; ICAP, 2014)

Year	Production	Imports	Exports	Apparent consumption
2008	102.289	13.411	23.468	92.232
2009	97.147	14.565	22.015	89.697
2010	95.307	14.996	23.087	87.216
2011	95.868	14.674	24.924	85.618
2012	95.648	15.425	27.849	83.224
2013	98.109	16.262	34.320	80.051
2014 (forecast)	102.000	16.600	40.000	78.600

The domestic butter market is prevailed by imports (90%) and shows small annual fluctuations. In recent years, the volume of consumption varied between 10.000-11.000 tons (Table 1.10). "Professional butter use", i.e. bulk butter in boxes, melted or condensed, used by various professionals, covers more than 80% of total domestic consumption. Butter for retail is available, mainly, through supermarkets and covers a small proportion of the total domestic consumption. According to estimates, the total value of domestic butter market fluctuated in the amount of 55 million euro in 2013 in wholesale prices.

Table 1.10. Domestic butter market (2008-2014)
(in tons; ICAP, 2014)

Year	Production	Imports	Exports	Apparent consumption
2008	1.200	10.280	270	11.210
2009	1.106	10.429	59	11.476
2010	1.093	9.628	156	10.565
2011	1.014	11.086	127	11.973
2012	1.341	8.919	101	10.159
2013	1.132	10.088	326	10.894
2014 (forecast)	1.200	10.500	350	11.350

The apparent cream consumption ranges at 35.000-36.000 tons since 2012 (Table 1.11). Approximately, 80-85% of the total consumption is related to processing/professional use while the remaining part is directed to retail. The total value of domestic cream market was, according to estimates, €70 million (in wholesale prices), in 2013.

Table 1.11. Domestic cream market (2008-2014)
(in tons; ICAP, 2014)

Year	Production	Imports	Exports	Apparent consumption
2008	8.400	15.417	262	23.555
2009	8500	28.099	1.238	35.361
2010	8.500	31.241	524	39.217
2011	8.300	37.898	241	45.957
2012	9.300	26.707	462	35.545
2013	10.000	26.713	815	35.898
2014 (forecast)	10.500	26.800	850	36.450

The category sour milk and milk-based drinks, includes products, such as sour milk (plain and with fruit juices), drinks based on milk and yogurt (or yogurt culture) with added fruit juices or flavor, flavored milk and drinks based on milk ingredients and flavor or fruit juice.

Table 1.12. Domestic sour milk and milk-based drinks market (2008-2014) (in tons; ICAP, 2014)

Year	Production	Imports	Exports	Apparent consumption
2008	7.679	6.545	404	13.820
2009	6.555	7.116	990	12.681
2010	6.628	4.992	2.925	8.695
2011	6.216	2.759	797	8.178
2012	6.208	1.998	893	7.313

2013	5.072	1.610	678	6.004
2014 (forecast)	4.500	1.500	650	5.350

The total domestic market of drinks based on milk records a downward trend since 2008. In particular, in 2013 domestic consumption was estimated at about 6.000 tons (Table 1.12). Furthermore, it is noteworthy that imports cover a significant part of the total consumption. The value of this particular market is estimated in wholesale prices at around 7 million euro in 2013.

1.3.2.3. Per capita consumption of main dairy products

Table 1.13 presents the per capita consumption of the main dairy products, i.e. all types of milk, yogurt, sour milk and drinks based on milk. However, butter and cream are not included as their biggest part is available in processing companies for professional use. Moreover, in order to calculate the per capita consumption of condensed milk, the quantities were converted into equivalent quantities of drinking milk at a rate of 2.1.

Pasteurized milk ranks by far first in the consumption (kg/person) of the main dairy products and is followed by condensed milk and high-temperature pasteurized milk. The per capita yogurt consumption shows a continuous decline from 2008 to 2013, reaching in 2013 7,24 kg/person.

Table 1.13. Per capita consumption of the main dairy products (2008-2013)

(per capita: kg/person; the population for the years 2008-2013 originates from the population's projections of ELSTAT; ICAP, 2014)

Product	2008	2009	2010	2011	2012	2013
Pasteurized milk and beverages	35,47	35,10	34,15	33,07	34,01	30,17
Condensed milk	22,89	22,50	24,43	27,41	24,56	19,27
High-temperature pasteurized milk	21,03	22,19	22,80	23,37	21,58	23,05
UHT milk	2,12	2,16	2,58	2,30	2,12	2,04
Yogurt	8,25	8,01	7,80	7,70	7,48	7,24
Sour milk-drinks based on milk	1,24	1,13	0,78	0,74	0,66	0,54

1.3.2.4. Cheese

The apparent domestic consumption of cheese showed a continuous increase between 2008 and 2010 (Table 1.14). More specifically, in 2010, domestic consumption reached the level of 361.000 tons, increased by 2.6% compared to 2009. However, in 2011, the market declined by 6.8% compared to the previous year while stagnation was observed in 2012.

Private label products are available in the cheese market, especially in recent years, by supermarket chains, mainly in the white cheese category. These products attract more and more consumers due to their lower price compared to the "branded" ones. Their participation rate in the retail channel was estimated around 10% in 2012. The largest part of total cheese consumption is covered by Greek cheeses. The participation of imported cheeses in total consumption fluctuated between 32-34% in recent years.

Table 1.14. Domestic apparent consumption of cheeses (2008-2013)

(in tons; ICAP, 2013)

Year	Production	Imports	Exports	Apparent consumption	Change (%)
2008	265.189	112.494	41.360	336.323	0,70
2009	269.094	125.015	41.654	352.455	4,80
2010	286.083	118.665	43.247	361.501	2,60
2011	272.174	113.884	49.025	337.033	-6,80
2012	279.046	110.042	50.759	338.329	0,40
2013 (forecast)	275.000	108.000	51.500	331.500	-2,00

The value of domestic cheeses market is estimated at the amount of €1,55 billion in 2012 in wholesale prices, decreased by 3-4% compared to 2011. Approximately, 70% of the domestic market value refers to cheese produced in Greece while the remaining 30% includes imported cheese.

1.3.2.5. Per capita consumption of cheeses

The apparent domestic cheese consumption records, generally, an upward trend, ranging in 30 kilos per person in recent years (Table 1.15). However, data are not fully comparable as the population data for 2011-2012 are based on the ELSTAT 2011 census (population projections) while for the previous years on the ELSTAT 2001 census.

Table 1.15. .Per capita consumption of cheeses (2008-2012) (ICAP, 2013)

Year	Cheese consumption (Kg/person)
2008	29,99
2009	31,3
2010	31,98
2011	29,8
2012	29,97

In Table 1.16, the per capita consumption of cheese, per product category, is presented. Regarding cheeses of domestic production, the category including 'Feta, Teleme, Soft Cheeses' shows overtime and by far the highest per capita consumption. The category 'Kefalotyri, Kaseri, Semi-Hard, Gravieres' ranks second.

In 2012, the purchase of standardized cheeses was estimated at 44.000 tons, covering 13% of the total cheese consumption, which was nevertheless 8% than the sales of 2011. The advantages of standardized products in comparison to unpacked ones concern aspects, such as practicality, safety and time saving. The standardized products' prices are higher than those of the unpacked ones, which justifies the decline in these products' consumption in 2012 (ICAP, 2013).

Table 1.16. Per capita consumption of cheese per product category (2008-2012) (ICAP, 2013)

Category	2008	2009	2010	2011	2012
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Cheeses of domestic production (kg/person)					
Feta, Telemes, Soft Cheeses	13,97	13,86	14,11	14,16	14,2
Kefalotyri, Kaseri, Semi-Hard, Gravieres	3,63	3,97	4,89	3,39	4,22
Whey cheeses	2,33	2,35	2,47	2,16	1,97
Melted cheeses	0,02	0,02	0,02	0,02	0,02
Total A	19,96	20,20	21,48	19,73	20,22
Imported cheeses (kg/person)					
Semi-Hard (Gouda, Edam, Emmental etc)	5,27	5,79	5,56	5,48	4,78
Hard (Grana, Regato)	2,71	2,79	2,57	2,44	3,19
Other (Blue Cheese, Roqueford, Grated, Melted, Cheese toast)	0,84	1,26	1,09	0,84	0,73
Soft and cream cheese	1,22	1,26	1,28	1,31	1,05
Total B	10,03	11,10	10,50	10,07	9,75
Total of domestic consumption	29,99	31,30	31,98	29,80	29,97

1.3.3. External trade of dairy products

1.3.3.1. Imports evolution

Total imports (in quantity) of dairy products showed an upward trend in 2008-2010. After a temporal decline in 2011-2012, a slight increase by 1,6% was observed in 2013 (Table 1.17). The value of imports amounted 357,8 million euro in 2013, compared to 329,6 million euro in 2012 (8,5% increase). Concerning the countries the products were imported from, Germany covered 47,8% of the total imported quantities, followed by the Netherlands (12,3%) and Hungary (9,1%) (ICAP, 2014).

Table 1.17. Imports of dairy products by category (2008-2013)
(in tons; ¹provisional data; ICAP, 2014)

Product category	2008 ¹	2009 ¹	2010 ¹	2011 ¹	2012 ¹	2013 ¹
Total milk	260.638	263.902	331.290	301.829	238.674	239.242
Sour milk (UHT)	15.417	28.099	31.241	37.898	26.707	26.713
Total yogurt	13.411	14.565	14.996	14.674	15.425	16.262
Other fresh milk products	6.545	7.116	4.992	2.759	1.998	1.610
Whey and other products	8.463	7.952	6.742	6.547	6.499	9.125
Total butter	10.280	10.429	9.628	11.086	8.919	10.088
Grand Total	314.755	332.063	398.890	374.793	298.222	303.130

Cheeses imports, in quantity, showed, in general, a continuous upward trend in previous years (Table 1.18), reaching in 2009 125.015 tons. However, the three last years they declined (-4% in 2011/2010 and -3,4% in 2012/2011) down to 110.000 tons in 2012. The value of total imports reached 406,5 million euro in 2011 and 391,4 million euro in 2012, reduced by 3,7%. Regarding

imports by cheese type, the biggest volume regards “semi-hard cheeses” followed by “hard cheeses” and “soft cheeses”. Concerning the countries the cheeses were imported from, Germany covered 32,9% and the Netherlands 30,1% of imports (ICAP, 2013).

Table1.18. Imports of cheeses by category
(in tons; ¹provisional data; ICAP, 2013)

Cheese type	2008 ¹	2009 ¹	2010 ¹	2011 ¹	2012 ¹
Semi-hard cheeses	59.069	65.228	62.846	61.924	53.914
Hard cheeses	30.356	31.428	29.096	27.630	35.972
Soft cheeses	13.650	14.138	14.455	14.844	11.883
Other cheeses	9.419	14.221	12.268	9.486	8.273
Total imports	112.494	125.015	118.665	113.884	110.042

1.3.3.2. Exports evolution

Exports of dairy products showed fluctuation during 2008-2013 (Table 1.19). In 2013, the quantities exported, amounted to 46.672 tons (increased by 21.4% compared to 2012), presenting the highest value in the last six years. Concerning the countries the products were exported to, the United Kingdom absorbed the 18,3% of the exports, followed by Italy (17,7%), Bulgaria (11,6%) and Cyprus (8,2%) (ICAP, 2014).

Table 1.19. Exports of dairy products by category (2008-2013)
(in tons; ¹provisional data; ICAP, 2014)

Product category	2008 ¹	2009 ¹	2010 ¹	2011 ¹	2012 ¹	2013 ¹
Total quantity of milk	2.602	3.144	3110	2.924	2.660	2.954
Sour milk (UHT)	262	1.238	524	241	462	815
Total quantity of yogurt	23.468	22.015	23.087	24.924	27.849	34.320
Other fresh milk products	404	990	2.925	797	893	678
Whey and other products	5.060	13.565	11.822	10.095	6.474	7.579
Butter	270	59	156	127	101	326
Grand total	32.066	41.011	41.624	39.108	38.439	46.672

Yogurt ranks first in the dairy sector exports. Indeed, yogurt exports (Table 1.19) showed an upward trend over the period 2010-2013, reaching in 2013 34.320 tons. This particular year, exports reached a top and won 73.5% of the total dairy exports share.

Cheeses exports (Table 1.20) have enduring rise in recent years. More specifically, in 2012, total exported quantities amounted 50.759 tons, showing an annual increase of 3.5%.

The category “Feta and Teleme” had the largest share of exports accounting 68.5% of the total exports in 2012. The second largest category, based on exports volume, is “hard and semi-hard cheeses”. This category includes Graviera, Kefalograviera, Kefalotiri and Pecorino type cheeses. Exports of these products accounted 16.4% of the total cheese exported quantities in 2012. “Fresh whey cheeses”, which mainly, include Anthotyro and Myzithra and “other fresh cheeses”, mainly Manouri, accounted for only 1.7% of the total exports in 2012. The value of exports amounted 237.5 million euro in 2011 and 274 million euro in 2012, increasing thus by 15.4%. . Concerning the countries the cheeses were exported to, Germany absorbed 32% of the exports, followed by the United Kingdom (12,2%), Cyprus (11,3%) and Italy (9,2%) (ICAP, 2013).

Table 1.20. Exports of cheeses by category
(in tons; ¹provisional data; ICAP, 2013)

Year	2008 ¹	2009 ¹	2010 ¹	2011 ¹	2012 ¹
Feta and Teleme	28.773	29.469	32.963	34.029	34.766
Hard and semi-hard cheeses	9.158	8.810	7.614	11.473	8.339
Whey fresh cheeses and other fresh cheeses	521	556	698	675	869
Other cheeses	2.908	2.819	1.972	2.848	6.785
Total exports	41.360	41.654	43.247	49.025	50.759

1.4. The demand for dairy products and cheeses

1.4.1. General characteristics of the demand

Dairy products are a staple food for the Greeks as they are consumed on a daily basis. Hence, there is relatively low elasticity regarding selling prices and available consumers' income. However, in recent years, consumers' choices are significantly influenced by the price of the various brand products available in the market. Also, the demand for dairy products is affected by the availability of competing and substitute products that are offered at a lower price. Further factors that affect consumers include:

- Specific features of products, e.g. taste, quality, nutritional value, shelf-life, packaging etc.
- Easy access to sales points
- Technological development and improvement, e.g. high- temperature pasteurized milk is, for example, easier to be transferred to remote geographical areas. With regards to cheese, the demand is higher for low fat cheeses or with less salt.
- Modern lifestyle and healthy diet, e.g. probiotic yogurt, functional dairy products, low calorie cheese
- Advertisement, which greatly influences the demand attracting consumers towards specific brands or new types of products.
- Age profile of the population, e.g. certain types of dairy products are being primarily consumed by younger people, e.g. chocolate milk, and children

An important trend in the food marketplace is the growing penetration of private label products, which is expected to grow further in the near future. The primary advantage of private label products is the price, which is lower than this of the brand-name products. This revulsion is mostly attributed to the consumers' reduced purchasing capacity due to the economic crisis. Moreover, the consumers consider these products are of quality and not at all disadvantages compared to the respective brand-name ones. Particularly in the dairy sector, the preference towards private-label products concerns mainly yogurt and UHT milk, produced either in Greece or abroad. On the contrary, the penetration of private label products is not easy in some dairy

products' categories, such as "fresh" pasteurized milk, due to the products' short expiration date and the consumers' preference towards the brand-name ones in this category.

Table 1.21. Price index of consumer of dairy products and cheeses (2008-2013)
(Base year 2009=100; ICAP, 2013)

Product	2008	2009	2010	2011	2012	2012 (first 7 months)	2013 (first 7 months)
Feta	97,91	100,00	101,78	103,06	104,19	103,86	105,43
Hard cheeses	101,76	100,00	101,22	104,84	106,04	106,18	105,96
Pasteurized milk	109,24	100,00	98,15	104,52	108,00	108,10	107,88
Chocolate milk	99,29	100,00	99,83	103,56	104,91	105,06	105,91
Preserved milk	100,00	100,00	100,8	101,39	101,91	101,83	99,45
Yogurt	100,87	100,00	96,48	98,00	100,83	100,49	102,32
Other dairy products	99,30	100,00	97,62	97,71	98,07	98,43	96,58
Butter	98,64	100,00	100,83	104,92	107,18	107,59	105,60
Food and non-alcoholic beverages	98,13	100,00	100,06	103,18	104,73	104,99	105,49

The price index of consumer, which is presented in Table 1.21, increased in almost all categories of products during 2010-2012. Pasteurized milk and yogurt recorded the biggest rise in 2012 compared to 2011, namely 3.3% and 2.9%, respectively.

The category "other dairy products" includes cream, whipped cream and desserts based on milk. Moreover, it should be mentioned that a key feature of cheeses demand is that the consumers' choices are based mainly on the type, category or geographical area of origin of cheese and less on a specific company brand.

1.4.2. Average monthly households' expenditure for dairy products and cheeses

Table 1.24 presents the average monthly households' total expenditure, the food expenditure and the total expenditure for dairy products and cheeses. The total expenditure, on a monthly basis, declined from 2008 to 2014, almost by 30%. However, this significant drop is not observed in food expenditure and total expenditure for dairy products and cheese as in this case was a decrease of only 13%.

It is worth mentioning that the share of the total expenditure for dairy products and cheese in the food expenditure has remained almost stable between 2008 and 2014, ranging from 17% to 18%, fact that is justified by the important position of dairy products and cheeses in the Greeks' dietary habits.

Table 1.22. Average monthly households' total expenditure (in euro), expenditure for food, dairy products and cheeses and % share of dairy products and cheeses in food expenditure (2008-2014)
(ELSTAT: Family Planning, 2008-2014)

Year	Total expenditure	Food expenditure	Total expenditure for dairy products and cheeses	% share of dairy products and cheeses in food expenditure
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2008	2.117,67	326,71	59,36	18,17
2009	2.065,11	335,38	59,15	17,64
2010	1.956,42	330,81	56,88	17,19
2011	1.824,02	334,51	58,16	17,39
2012	1.637,10	311,60	55,52	17,82
2013	1.509,39	290,96	52,45	18,03
2014	1.460,52	283,90	51,23	18,04

The average monthly expenditure per household, for specific categories of dairy products, is shown in Table 1.25. The largest part of the expenditure relates to the purchase of pasteurized milk by far while the expenditure for yogurt is, also, high compared to the other dairy products.

Table 1.23. Average monthly households' expenditure (in euro) for dairy products, by category (2008-2014)
(ELSTAT: Family Planning, 2008-2014)

Year	Dairy products expenditure	Pasteurized milk	Condensed and powdered milk	Yogurt	Other dairy products	Butter
2008	30,98	15,43	5,04	7,56	2,41	0,55
2009	30,23	14,49	4,99	7,90	2,32	0,53
2010	28,32	13,31	4,40	7,72	2,28	0,59
2011	28,78	13,94	4,20	7,76	2,18	0,71
2012	27,78	14,30	3,74	7,22	1,90	0,63
2013	26,53	13,63	3,25	7,08	1,89	0,68
2014	26,96	13,78	3,45	7,45	1,56	0,72

The average households' expenditure for purchasing cheeses, on monthly basis, is listed in Table 1.26. Between 2008 and 2014, the amount of money spent by households has reduced, reaching in 2014 its lowest level (24,27 euro per month).

The households' expenditure is related, primarily, to purchasing soft cheeses and secondarily hard cheeses. The average monthly expenditure for low-fat cheeses, during this period, is very low. However, the three last years (2012-2014), the purchase value increased.

Table 1.24. Average monthly households' expenditure (in Euro) for cheeses, by category (2008-2014)
(ELSTAT: Family Planning, 2008-2014)

Year	Cheeses expenditure	Soft cheeses	Hard cheeses	Low-fat cheeses
2008	28,38	16,10	11,45	0,82
2009	28,92	16,34	11,64	0,93
2010	28,56	15,75	11,83	0,99

2011	29,38	16,40	11,96	1,02
2012	27,74	15,69	11,28	0,77
2013	25,92	14,57	10,53	0,83
2014	24,27	13,77	9,57	0,93

1.4.3. Analysis of the consumers' questionnaire

In the context of the present study, a questionnaire was constructed aiming at investigating and recording current preferences and expectations of consumers with regards to dairy products. A total of 83 questionnaires were filed based on either on-line or in-person responses. Although the sample cannot be considered representative, some interesting findings came up.

In particular, 60% consume pasteurized cow milk. Although 76,3% had never drunk goat milk, 2,5% consume goat milk on a daily basis. Moreover, 56,8% purchase milk produced from small local dairy units, while 10% choose private label milk. Interestingly, 75,6% do not choose milk with added bioactive (functional) components (Figure 1.1).

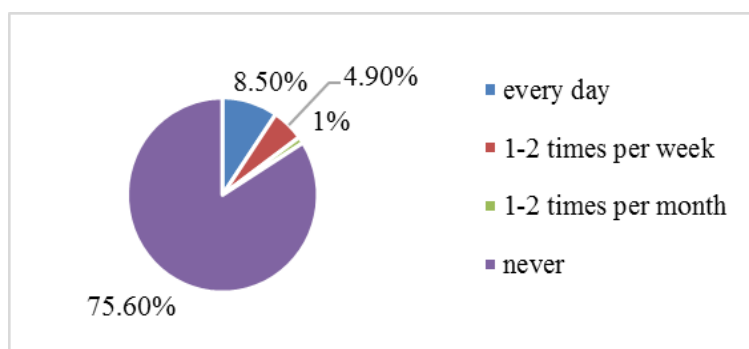


Figure 1.1. Consumption of milk with added bioactive components

With regards to yogurt, 65,8% of the consumers prefer strained yogurt (Figure 1.2a). Moreover, 66,7% do not consume yogurt enriched with beneficial bacteria (probiotic), 50% prefer yogurt made from cow milk and 50% purchase yogurt produced by small local dairy units (Figure 1.2b) and 70% have never consumed sour milk.

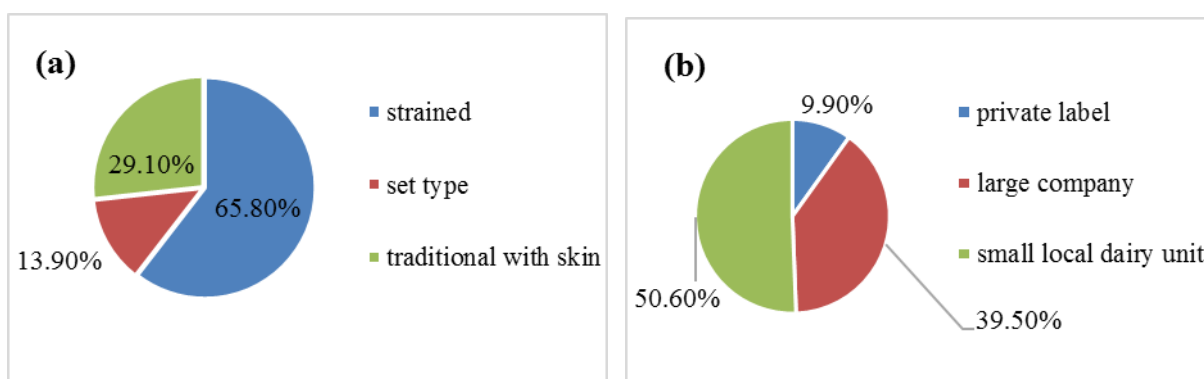


Figure 1.2. Yogurt consumption (a) per type of yogurt and (b) per type of production unit

Regarding cheese, 53% consume traditional Greek cheeses, 45,8% consume Greek and imported cheeses while only 1,2% exclusively choose imported cheeses. As expected, Feta cheese ranks first (60% of consumers) followed by Graviera, Kefalotyri and Kasseri. Interestingly, 58,5% consume cheese made from goat milk at least 1-2 times per month (Figure 1.3a). Moreover, 62% are willing to pay more for a traditional Greek cheese from goat milk (Figure 1.3b) while 59,2% believe that goat milk cheeses are more beneficial to human health compared to cow or sheep milk ones (Figure 1.3c). Finally, 60% of the consumers are interested in the product traceability, i.e. geographical area of origin, production date, details of the producer etc., while 90% are interested both in the quality assurance systems of manufacturing and the quality standards certification of the dairy products.

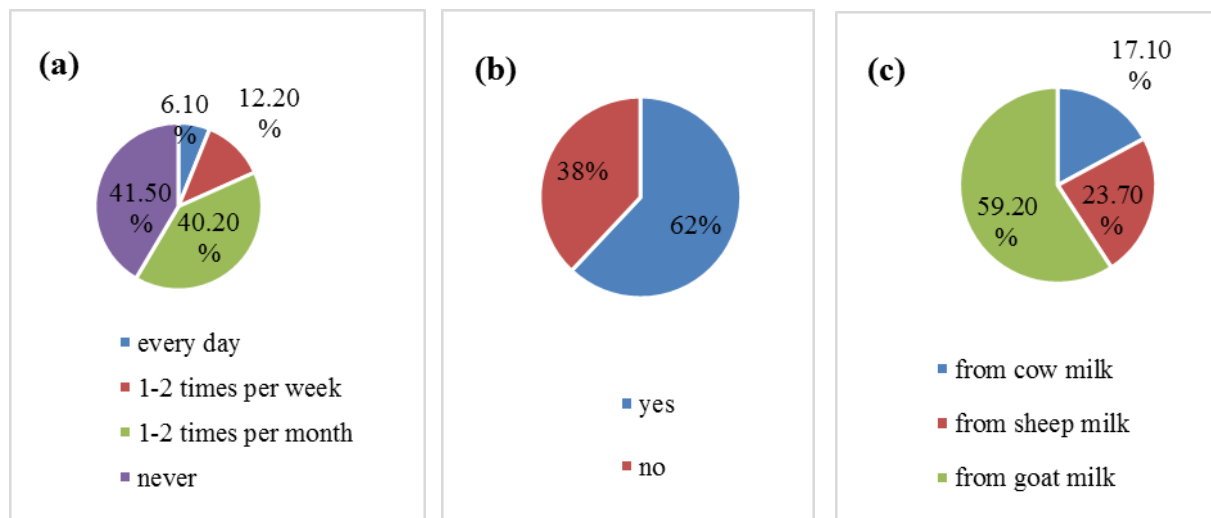


Figure 1.3. Cheese consumption (a) goat milk cheeses, (b) willingness to pay more for traditional goat milk cheeses and (c) cheese health benefits assumption per type of milk used.

Chapter 2. The small, family dairies in Greece: an overview

2.1. Introduction

Small dairies and cheese making units can be divided in two main categories according to the modernization level they have achieved, namely traditional artisanal dairies and contemporary/up to date ones.

A small percentage of the traditional dairies, found mainly in mountainous and semimountainous areas, still operate seasonally depending on the availability of milk, especially sheep and goat milk. These dairies are rather nomadic as they follow the herd, which produce the milk they process and are owned by the livestock farmer. Hence, very simple processing means are used and a restricted variety of goods is produced. Moreover, since they are usually installed under sheds and other substandard establishments they do not abide any of the rules of the official good hygiene practices (Anyfantakis 2004). The abandonment of nomadic lifestyle that characterized old herder families of nomadic ethnic groups, such as the Vlachs and the Sarakatsanes is bringing about the complete extinction of this practice. However, the majority of the traditional dairies include permanently established facilities, which are mainly run by breeders (verticalized units). In these cases, a more effective yet rudimentary and traditional processing equipment is used, the capacity is bigger and a wider variety of goods is usually produced. Experienced and skilled owners, even with those limited means, can eventually produce dairy products of high quality. The products are mostly distributed directly to the consumers by the livestock farmers themselves. Although hygienic processing conditions are of higher level, most

of these units fail to meet all rules of the official good hygiene practices, e.g. HACCP, ISO, national legislation (Anyfantakis 2004). Consequently, most of them cannot receive operating license from the Hellenic Food Authority (EFET). Hence, even these traditional dairies are nowadays doomed to extinction unless they get modernized.

The vast majority of legally operating small dairies is contemporary with a varying extent of modernization. The differences are observed in various aspects such as milk supply vehicles, facilities and equipment, milk transport lines within the unit, production line, capacity and automation level, cold rooms, packaging equipment, waste management etc. Almost all these small companies have invested in upgrading and modernizing their units through EU and/or state funding programmes mostly during the period from 2000-2009. Most of these units produce a very wide variety of dairy products, including local traditional cheeses and PDO cheeses of high quality and distinctive characteristics attributed to their origin. These units conform to all EU and national regulations regarding milk processing. The chemical and microbiological analyses are performed by private laboratories, although a few processing units (mainly cheese making ones) have their own laboratory. Very few units are vertically integrated and in most of them milk is collected mainly from adjacent small and medium-size, usually semi-extensive farms in a radius no more than 10 km (Anyfantakis 2004). The owners of these units usually have long-term relationships and interpersonal trust with the livestock farmers. In many small family dairies the knowledge of dairy practice and particularly cheese making is transferred from generation to generation. In some cases, the units' owners and/or personnel have received specialized education in farming and dairy schools. Some of the latter have one and in some cases even more certified technicians with a specialization in dairy processing (university degree) (Goussios et al. 2014). Some of the aforementioned small processing companies have a cooperative status.

Small dairy enterprises process both bovine (cow and water buffalo) and small ruminants (sheep and goat) milk. Therefore most of them produce a wide and diverse range of dairy products, including traditional and PDO cheeses made from sheep and goat milk, including Feta cheese.

Small-size companies trade their products directly, mainly through the local and secondly to the regional market (retailers, super-markets and catering companies e.g. hotels, taverns, restaurants and pastry shops) or collaborate with networks of representatives, intermediaries and wholesalers. Interestingly, trading via own contacts and loyal customers brings higher profits than trade at national level through networks of wholesalers and large retail chains. Some companies have even their own retail shops (Goussios et al. 2014). The territorially orientated marketing allows small companies to take advantage of their PDO and traditional products and their high quality and to withstand competition from larger units that can benefit from economies of scale.

A number of small dairy companies export their products, mostly to the EU, however in limited quantities and without any particular promotion strategy. Their attempts to expand in the European market are usually based on personal relations with retailers, family networks or acquaintances with Greek diaspora communities. Moreover, some small companies are participating in international food fairs and exhibitions and thus gain access to the European marketplace (Goussios et al. 2014). Consequently, although some dairy products, especially cheeses and the "Greek yogurt" are highly appreciated abroad and regarded as a central element of the Mediterranean diet, the individual, non-consolidated and sporadic attempts towards business relationships establishment within the EU marketplace as well as the lack of strategy to promote the specific collective attributes of the Greek traditional and PDO dairy products are obstacles for the small producers to capture a greater share of the value created in the international value chain.

2.2. Legislation about small dairy processing units

According to the recently voted (22.12.2014) Decision 3724/162303 (FEK 3438/ B/2014; national measures and deviations in foods of animal origin on application of the EU regulations 852/2004 and 853/2004), dairy processing units with capacity less than 500 kilograms of milk per day are regarded as small. The aforementioned legislation sets rules concerning both the

operation of the processing unit and the compliance with the hygiene standards (a more flexible application of HACCP in particular). These rules are less strict than those set by the regulations 852/2004 and 853/2004, yet effective in avoiding any possible contaminations.

In the Decision, it is also stated that “own production of dairy products in the livestock farm” is the production of dairy products at a manufacturing sites within the limits of the livestock farm for the purpose of commercializing these products to the final consumer through the local market (public markets, producers’ markets). It is clearly stated that own producing livestock farms’ operation is subjected to the competent veterinary authorities, the milk comes exclusively from the livestock farm itself and the daily processed quantity of milk should not exceed the limit of 300 kg. Finally, the Decision describes the permitted differentiations in the processing sites, equipment and practices of processing units and livestock farms that produce “milk-based products with traditional characteristics”.

Regarding association entities that help dairy units, especially the small ones, to protect and promote their products, unfortunately no data about currently existing entities could be found. However, the respective legislation is in power since 2013 and it is anticipated that it is matter of time but also willingness from the side of producers to take advantage of this.

In particular, as Milk Producer Organization (MPO) [Decision 2133/101443 (FEK 2226/20013)] is defined a private legal entity that has legally been established with the initiative of livestock breeders and producers of all types of milk and milk products and it is aiming at one or more of the following targets, namely (a) ensuring that the production is well planned and adjusted to the demand, especially concerning quantity and quality, (b) gathering options about the offer and disposal at the market of its members’ products, (c) optimizing production costs and stabilizing producer’s prices. Each MPO must have a minimum number of members and a minimum marketable production quantity, which are well defined but may differ depending on the administrative region. Finally, unions of MPOs can also be established from one or more MPOs with jurisdiction to act on behalf of its members.

Furthermore, Inter-Professional Organizations (IPO) in the dairy sector [Decision 2133/101443 (FEK 2226/20013)] is defined a non-profitable private legal entity established on the basis of cooperation among milk producers and other professionals related with the dairy sector, i.e. processing, products distribution and trade. These IPO must be mainly active within the field of its members’ activities, covering at least 1/3 of the production and utilization of the raw milk in its activity area. IPOs can act at regional and national level on behalf of their members as described in the EU Regulation 1234/2007 (Article 123, Paragraph 4c). These actions include (a) improving the knowledge and transparency concerning the dairy production and marketplace, (b) coordinating the dairy products’ disposal at the market, (c) promoting milk and dairy products consumption, (d) analysis of export potential, (e) conduction of studies on the promotion of the production of dairy products that respond to the market’s needs and the consumers’ preferences, (f) establishing a fair competition environment extending from the raw material production throughout to distributors and retailers, (g) supporting the sustainable development of the dairy sector through the promotion of innovation and applied research projects, (h) pursuing methods and practices for the enhancement of product safety and animal welfare, (i) developing methods for improving product quality, (j) exploiting and promoting the potential of organic farming and of products with quality and geographical indications, (k) promoting the integrated and environmentfriendly production methods.

2.3. Distribution of small dairy enterprises

In total, 793 milk and dairy products facilities are licensed by EFET (www.efet.gr), 766 of which are processing units and 27 packaging companies. On the other hand, according to ELOGAK (2015) (Hellenic Milk and Meat Organization) the number of the existing milk processing units for the year 2014 is 724. Unfortunately, it was not made possible to clarify the reasons for this discrepancy. According to STAKOD 2008 (Statistical Classification of Economic Activities), which is harmonized with NACE Rev 2 classification system of the EU, these enterprises fall within the class “Dairy Production” (code number 10.5) and the subclass “Operation of Dairies and Cheese Making Units” (code number 10.51).

In 2014, 558 enterprises processed annually less than 1000 tons of milk (ELOGAK), which stands for the 77% of the total number of dairy enterprises, 113 processed between 1000 and 5000 tons and 53 processed more than 5000 tons (Figure 2.1).

These enterprises can be divided in the following sub-categories: (a) enterprises with the production of cheeses as exclusive or main activity, (b) enterprises with the production of dairy products other than cheese as exclusive or main activity, (c) agricultural cooperatives which either produce exclusively dairy products or they produce a variety of agricultural products including dairy products and (d) enterprises from the wider food industry that have expanded in a lesser degree to the dairy production.

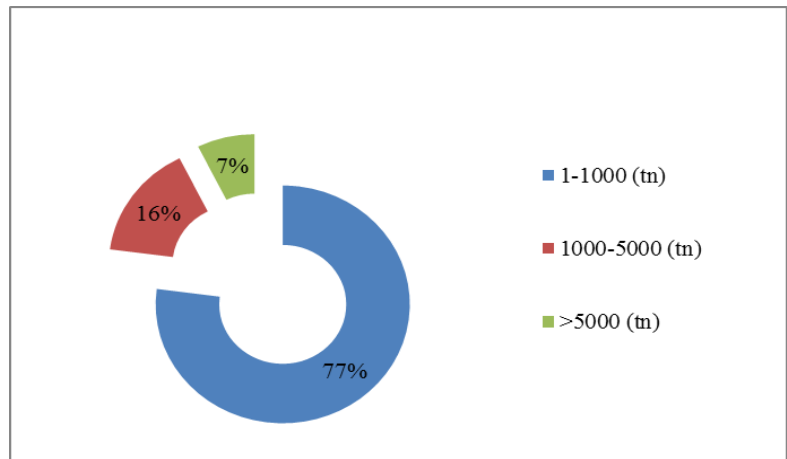


Figure 2.1. Distribution of dairy units in Greece according to the annually incoming quantity of milk (in tons; ELOGAK, 2015)

Table 2.1. Total quantities of the annually delivered cow, sheep and goat (primary production) by the producers per administrative region (2014) (ELOGAK, 2015)

Administrative region	Cow milk	Sheep milk	Goat milk
Attica	7.925	5.913	944
North Aegean	1.654	34.897	3.811
Western Greece	19.150	98.170	14.821
Epirus	17.289	49.688	7.138
Thessaly	93.401	104.083	20.890
Ionian Islands	147	4.786	1.512
Crete	233	42.731	3.552
Eastern Macedonia and Thrace	102.955	28.275	9.927
Western Macedonia	26.530	33.338	7.824
Central Macedonia	300.403	79.405	29.777
South Aegean	16.232	856	1.073
Peloponnese	4.610	34.506	20.695

Central Greece	26.600	21.512	4.558
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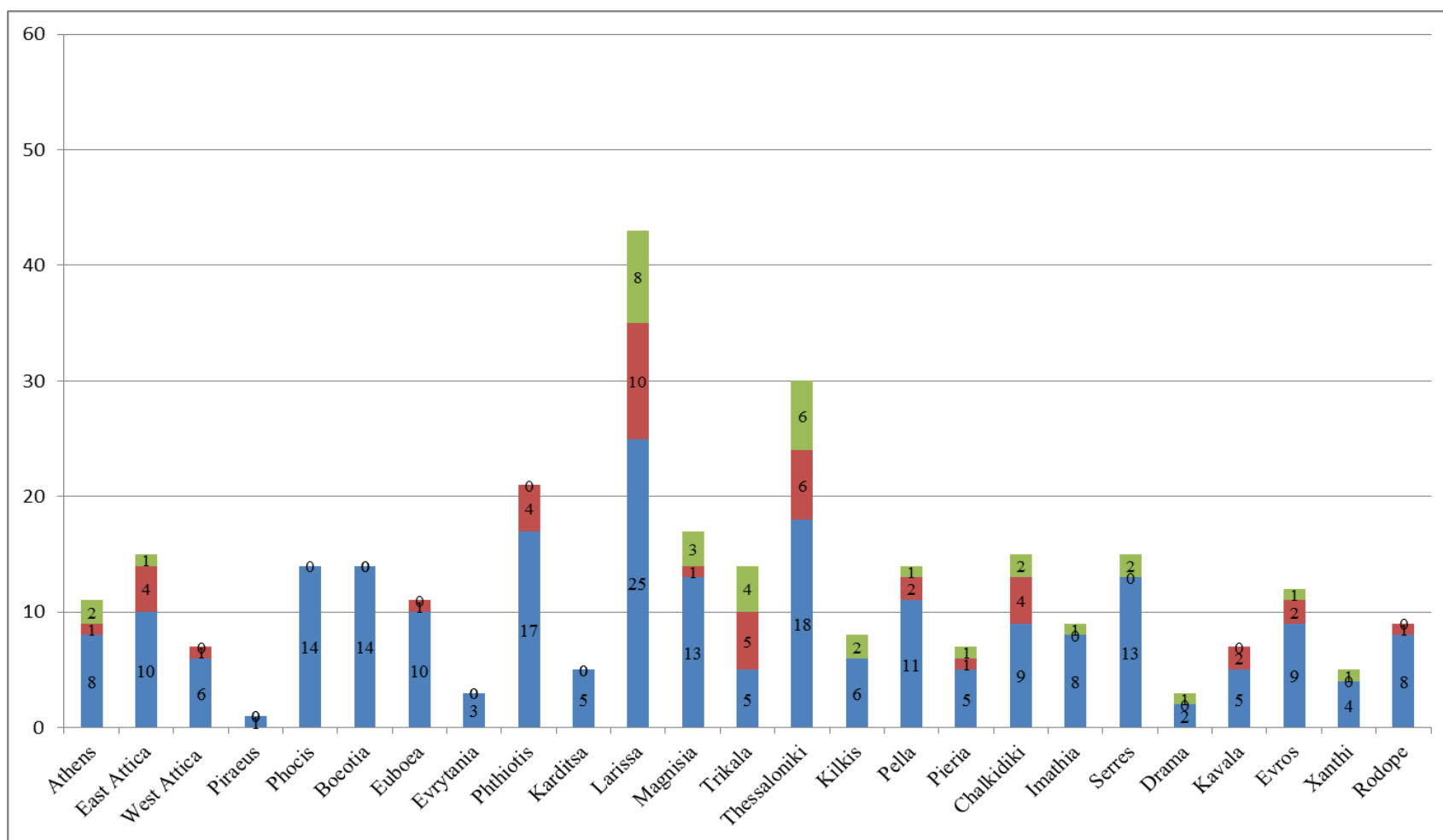


Figure 2.2. Geographical distribution of Dairy Enterprises in Administrative regions of Attica (Athens Prefecture –Piraeus Prefecture), Central Greece (Phocis-Phthiotis), Thessaly (Karditsa-Trikala), Central Macedonia (Thessaloniki-Imathia) and Eastern Macedonia and Thrace) according to the annually incoming quantity of milk(in tons; ELOGAK, 2015)

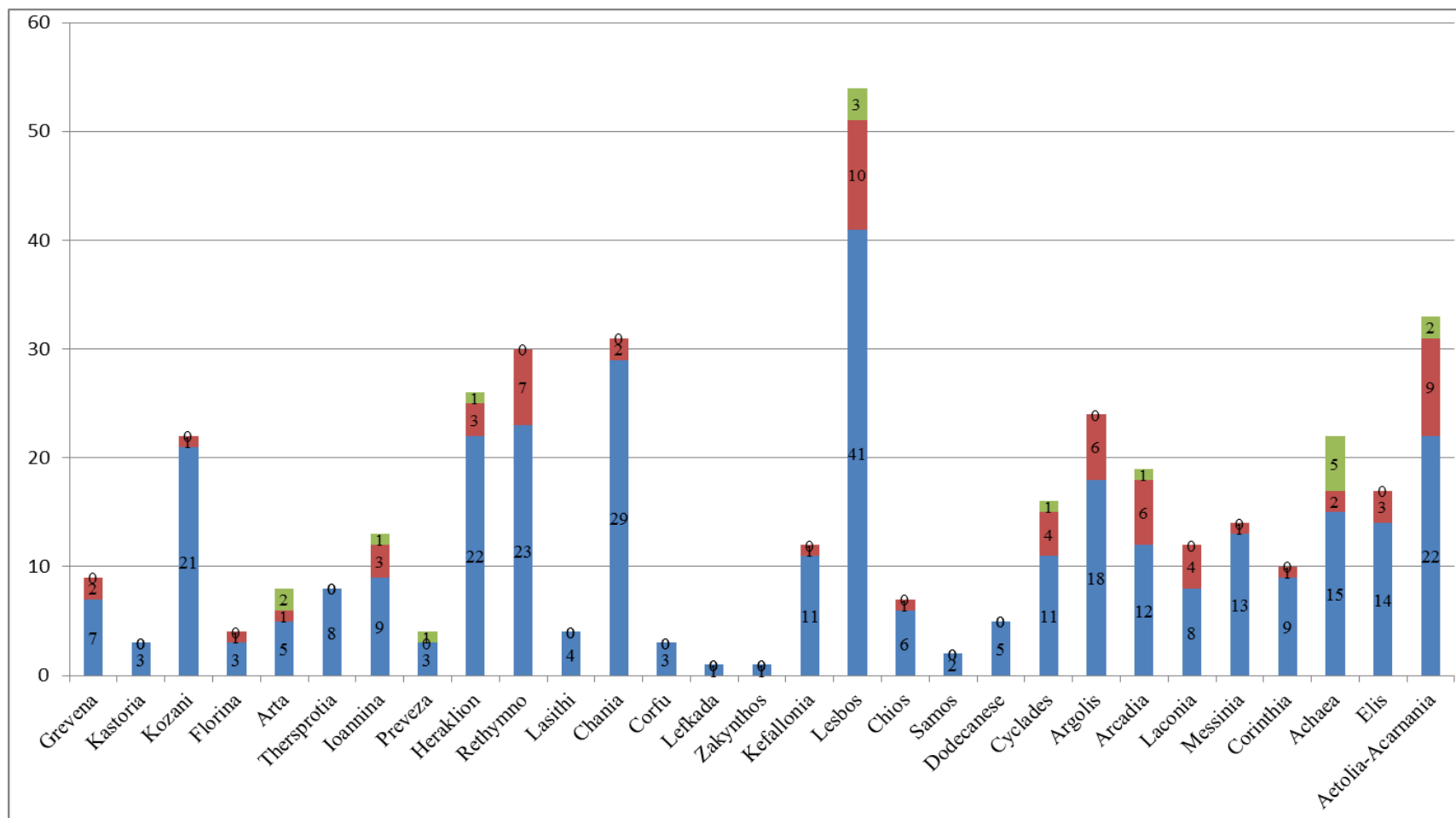


Figure 2.3. Geographical distribution of Dairy Enterprises in Administrative regions of Western Macedonia (Grevena-Florina), Epirus (Arta-Preveza), Crete (Heraklion-Chania), Ionian Islands (Corfu- Kefallonia), North Aegean (Lesbos-Samos), South Aegean (Dodecanesse-Cyclades), Peloponnese (Argolis-Corinthia) and Western Greece (Achaea-Aetolia-Acarnania) according to the annually incoming quantity of milk (in tons; ELOGAK, 2015)

Table 2.2. Total quantities of the annually incoming cow, sheep and goat milk in the processing units per regional unit (in tons; ELOGAK, 2015)

Regional unit	Cow milk	Sheep milk	Goat milk	Regional unit	Cow milk	Sheep milk	Goat milk
Athens	173.288	13.957	3.447	Florina	450	2.708	385
Eastern Attica	43.560	4.799	1.354	Kozani	2.112	3.039	1.049
Western Attica	1.318	1.456	286	Arta	37	41.135	4.134
Piraeus	600	0	0	Thesprotia	0	2.471	480
Boeotia	281	549	127	Ioannina	12.487	36.685	6.295
Euboea	86	1.731	689	Preveza	5.489	762	50
Evrytania	0	237	61	Heraklion	107	13.802	671
Phocis	0	1.842	670	Lasithi	0	1.964	209
Phthiotis	2.873	7.447	1.800	Rethymno	89	17.425	1.766
Karditsa	566	628	119	Chania	38	9.693	914
Larisa	114.310	68.795	14.990	Zakynthos	0	32	6
Magnisia	10.616	20.259	2.299	Corfu	229	99	8
Trikala	25.150	43.988	7.824	Kefallonia	380	4.332	1.420
Thessaloniki	63.438	35.236	15.395	Lefkada	0	9	0
Chalkidiki	1.327	16.569	9.922	Chios	1.361	7	555
Kilkis	25.674	2.555	1.157	Lesbos	0	46.242	4.833
Pella	9.787	10.567	2.001	Samos	316	30	62
Pieria	5.910	5.521	1.006	Dodecanese	1.199	71	51
Serres	26.700	1.355	496	Cyclades	15.043	783	1.010
Imathia	1.856	7.649	1.844	Argolis	1.022	6.617	4.570
Drama	14.891	2.566	810	Arcadia	299	17.018	7.315
Evros	15.547	4.143	2.160	Corinthia	328	2.751	1.096
Kavala	278	2.471	3.065	Laconia	29	4.587	5.402
Xanthi	25.021	8.008	2.491	Messinia	0	3.950	493
Rodopi	1.309	2.570	514	Aetolia-Acarnania	0	33.162	2.625
Grevena	617	4.492	1.371	Achaea	8.397	32.562	9.464
Kastoria	0	219	7	Elis	2.940	8.899	723

Table 2.3. Produced quantities (in tons) of cheeses in 2013 (ELOGAK, 2013)

Administrative region	Hard/Semi-hard	Soft	Whey
Attica	1.661	2.354	227

Central Greece	337	3.351	304
Thessaly	9.959	46.959	8.329
Central Macedonia	5.790	24.541	2.287
Eastern Macedonia and Thrace	392	3.395	413
Western Macedonia	573	1.981	195
Epirus	3.333	18.604	2.436
Crete	4.605	1.446	2.481
Ionian Islands	156	1.182	143
North Aegean	1.905	3.648	559
South Aegean	1.427	110	54
Peloponnese	1.883	8.549	2.217
Western Greece	4.032	13.818	2.526

The definition of small dairy processing units according to the aforementioned Decision 3724/162303 was set only recently (December 22, 2014) and thus the national authorities could not make available any data regarding either the exact number of processing units with capacity less than 500kg/day (approximately 100 tons/year) or with the exact number of own producing livestock farms and processing units and/or livestock farms that produce “milk-based products with traditional characteristics”. Therefore, in the present study enterprises were grouped according to the annually incoming quantity of milk are provided by ELOGAK. The distribution of the dairy processing units by administrative region and regional unit is shown in Figures 2.2 and 2.3.

Although Attica is an administrative region with low primary milk production (Table 2.1) and relatively few processing units, namely 34, the 73.5 % of which have an annual capacity less than 1.000 tons. Athens has the biggest quantity of incoming cow milk nationwide (173.288,053 tons) (Table 2.2), hosting two of the biggest cow milk processing units, Fage and Delta (ICAP, 2014). Eastern Attica is the regional unit with the 4th bigger quantity of incoming milk (Table 2.2).

Central Macedonia has the most processing units (98, 71.4% of which have a capacity less than 1000 tons/year). It is the administrative region with the biggest primary production of cow milk and the corresponding total quantity of incoming cow milk. Thessaloniki, the 2nd biggest city of Greece, is processing the 3rd biggest quantity of cow milk, the 4th of sheep milk and the 1st of goat milk nationwide (Table 2.2). Central Macedonia has some of the biggest cow milk processing units nationwide, among which Krikri and Mevgal (ICAP, 2014). Moreover, it has the 2nd biggest production of cheeses nationwide (Table 2.3), mostly PDO Feta and PDO Kasseri.

Eastern Macedonia and Thrace, with 36 dairy enterprises, 77.7% of which have a capacity less than 1000 tons/year, is an administrative region where also quite a big quantity of cow milk is being processed (Table 2.2) and also ranks 2nd in cow milk primary production (Table 2.1).

In Thessaly (79 processing units, 60.7% of which have a capacity less than 1000 tons/year) the majority of sheep milk is produced and the biggest quantities of sheep milk nationwide are being processed. Particularly, Larisa is ranking 1st in incoming sheep milk and also 2nd in goat milk and 2nd in cow milk. Thessaly is actually the administrative region with the biggest production of cheeses (Table 2.2) and has one of the biggest cheese making units nationwide, namely Tyras AE. According to data from ELOGAK (2010), it accounts for the 33% of the national production of PDO Feta cheese, with use of 85% of sheep and goat’s milk local production. Especially in Thessaly, Feta accounts for the 95% of the production of all PDO cheeses.

Epirus, with relatively few processing units (namely 33, 75.7% of which with a capacity less than 1000 tons annually) is also an administrative region with big incoming quantities of sheep

and goat milk. Particularly, Ioannina comes 4th in processing of sheep milk nationwide (Table 2.2). Epirus has the 3rd biggest production of cheeses nationwide (Table 2.3), mostly PDO Feta.

Peloponnese, with quite many dairy processing units (namely 79, in the 75.9% of which less than 1000 tons/year are being processed) has quite noticeable quantities of annually incoming sheep and goat milk (Table 2.2).

In Western Greece (72 dairy enterprises, 70.8% of which process less than 1000 tons of milk annually) ranks 2nd in sheep milk production nationwide, the processing activity of sheep and goat milk is notably high, especially in Aetolia-Acarnania and Achaia, with the latter being 4th in processing of sheep milk nationwide (Table 2.2).

Central Greece (63 dairy enterprises, 92% of which with capacity less than 1000 tons/year) and Western Macedonia (38 dairy enterprises, 89.4% of which with capacity less than 1000 tons/year) seem to be the administrative regions with the lowest dairy processing activity concerning the mainland of Greece (Table 2.2).

Crete is an insular administrative region with many processing units, namely 91, with 85.7% of them processing less than 1000 tons annually. It is an administrative region with quite notable sheep milk production (Table 2.1) and processing activity, particularly in Rethymno (Table 2.2).

North Aegean is an insular administrative region with a significant sheep milk production and quite many processing units (namely 63, with 77.7% of them having annual capacity less than 1000 tons), with the vast majority of them being in Lesbos. The existence of so many processing units there corresponds with the incoming quantities of sheep and goat milk in this regional unit. Lesbos actually comes 2nd in processing of sheep milk nationwide (Table 2.2).

South Aegean (45 processing units, 75.5% of which with capacity less than 1000 tons/year) and Ionian Islands (namely 17, the 94.1% of them having capacity less than 1000 tons/year) have relatively small incoming quantities of milk in their processing units, which makes sense if the relatively small size of these insular areas is taken into account. Interestingly though, the incoming quantities of cow milk in Cyclades are quite big (Table 2.2).

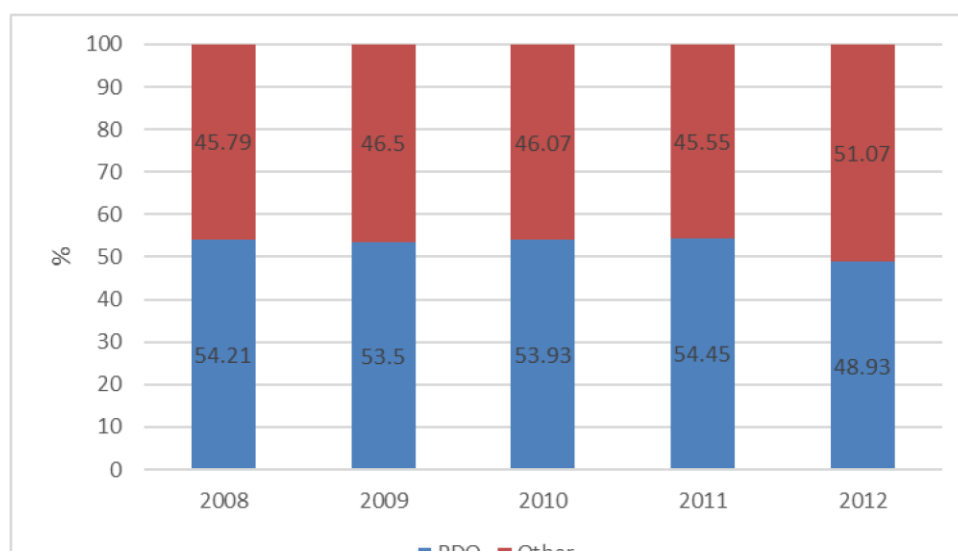
2.4. Greek PDO and traditional cheeses

2.4.1. Greek PDO cheeses

In the context of the EU Regulation 510/06 21, Greek cheeses are certified with the Protected Designation of Origin (PDO). The produced quantities of the Greek PDO cheeses for the years 2012 and 2013 are shown in Table 2.4. The geographical distribution of Greek PDO cheeses is shown in Figure 2.5. As it is shown in Figure 2.4, PDO cheeses have always been accounting for the 50% more or less of the total industrial production of cheeses. PDO Feta accounted every year for the 90% more or less of the total PDO cheeses production (Table 2.4).

Table 2.4. Produced quantities (in tons) of PDO cheeses for the years 2008-2014 (ELOGAK, 2015)

PDO cheese	2008	2009	2010	2011	2012	2013
Feta	91.734	95.367	101.175	92.484	86.567	94.765



Kasseri	2.516	2.633	3.964	3.134	2.773	2.527
Kefalograviera	2.205	2.165	2.408	2.539	2.511	2.304
Graviera Kritis	1.261	786	1.247	1.294	1.732	1.759
Graviera Naxou	645	819	1.003	874	968	1.031
Manouri	1.010	1.079	1.006	896	840	925
Kalathaki Limnou	472	436	203	359	506	401
Ladotyri Mytilinis	193	237	188	317	497	413
Katiki Domokou	271	449	388	317	389	455
Galotyri	370	285	263	232	175	220
Sfela	83	54	70	92	86	75
Xynomyzithra Kritis	10	4	31	45	36	43
Batzos	55	68	34	47	26	26
Formaella Arachovas	2	0	1	6	22	26
Pichtogalo Chanion	8	6	20	22	21	18
Anevato	17	9	12	18	11	14
Kopanisti	31	35	31	39	2	5
San Michali	48	50	101	46	0	21
Graviera Agrafon	0	0	0	0	4	0
Xygalo Sitias	0	0	0	0	0	0
Metsovone	0	0	0	0	0	0
Total	100.931	104.482	112.115	102.841	97.164	105.083

Figure 2.4. Participation of PDO cheeses in the total industrial production of cheese (2008-2012) (ICAP, 2013)

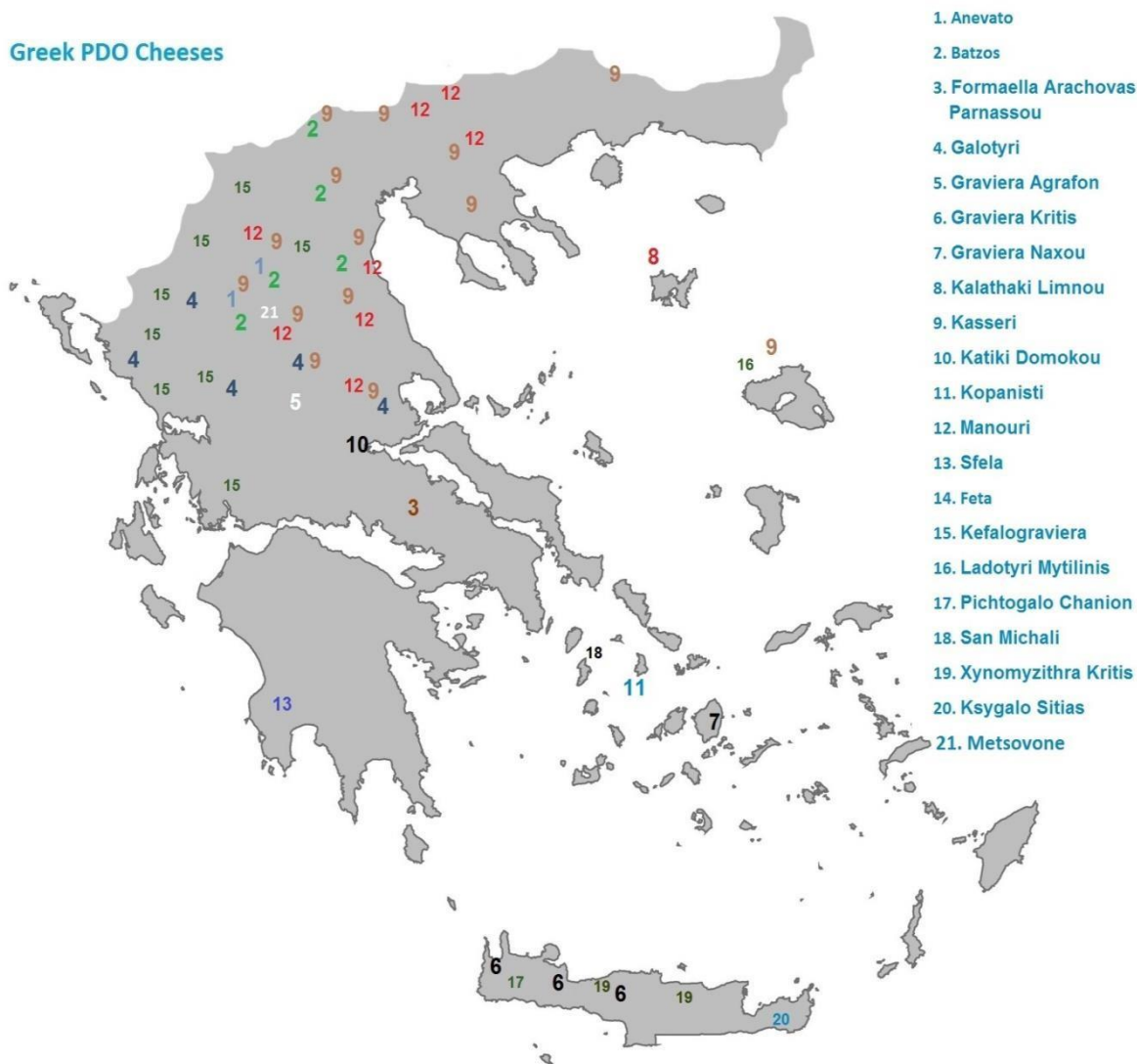


Figure 2.5. The geographical distribution of Greek PDO cheeses

Feta (Decision 313025/1994 in FEK 8/B/1994, 101/B/1994) is a soft white PDO cheese ripened in brine prepared from sheep milk or mixture of sheep with up to 30% goat milk. It is produced in the continental parts of the administrative regions of Attica, Central Greece, Western Greece, Peloponnese, Thessaly, Epirus, Western Macedonia, Central Macedonia, Eastern Macedonia and Thrace and from the regional unit of Lesbos. There are totally 241 processing units licensed to produce, pack and standardize PDO Feta cheese, located as shown in Figure 2.6. Moreover, there 13 enterprises licensed only to pack, standardize and trade (3 in Attiki, 2 in Imathia, and one in each of the regional units of Evros, Euboea, Thessaloniki, Kilkis, Magnisia, Pieria, Phthiotis and Heraklion) and 35 enterprises licensed only to trade Feta cheese (21 in Attiki, 3 in Larisa, 2 in Thessaloniki and one in each of the regional units of Evros, Imathia, Karditsa, Kilkis, Kozani, Corinthia, Rethymno, Xanthi and Pella) (Agrocet, 2014).

A small rise in its produced quantity was observed in 2010 and was followed by a small decline until 2013, when a small rise was observed again. PDO Feta cheese is produced in significantly bigger quantities comparing to the other PDO cheeses (Table 2.4). Feta accounts for over 40% of the consumption in Greece. It is a staple food in Greece that accompanies almost every kind of meal and it is used in a number of Greek recipes (Goussios et al. 2014). Feta has been subjected to fierce competition from white Feta-type cheeses from Northwest Europe. In 1996, the

EU recognized Feta as a Greek PDO product and provided for an adjustment period of 5 years for the other member states that produced "Feta" type cheeses (based on cow milk). Germany, Denmark and France made an appeal to the European Court against the decision of the Commission, claiming that Feta is a "generic" product, which involves basic manufacturing practices found in all Balkan countries under different nominations. In 1999, the European Court cancelled the issuance of this appellation. Under the 1070/99 Regulation, Feta had been removed from the list of European PDOs. After new appeals from the Greek side, it was decided in 2003 to renew the Greek Feta PDO label (Regulation 1829/2002). The main arguments in favor of the "Greek" Feta were as follows: (a) Feta has been produced in Greece since antiquity (according to historical sources) from sheep and goat milk and according to the perceptions of European consumers, (b) Feta is associated with Greece, (c) Feta manufacturing processes were codified in Greece much earlier than abroad and (d) production of Greek Feta covers more than 60% of the total cheese production in Greece (80% of total production of cheeses from sheep and goat milk). All these prove the close relationship of the Greek territory and Feta cheese in its natural and cultural environment, predominantly in mountainous areas and semi-arid rocky mountains (Goussios et al. 2014). Shortly after the second issuance of the PDO Feta to Greece, the German and the Danish government as well as German, Danish and French producers' organizations made again an appeal to the Tribunal of the European Community against the Regulation 1829/02. In 2005, the Court ruled in favor of the certification of the designation of Greek origin. Dairy industries producing Feta type cheeses in EU member countries had a transition period up until 2007 to completely eliminate the word "Feta" from the labeling of their products.

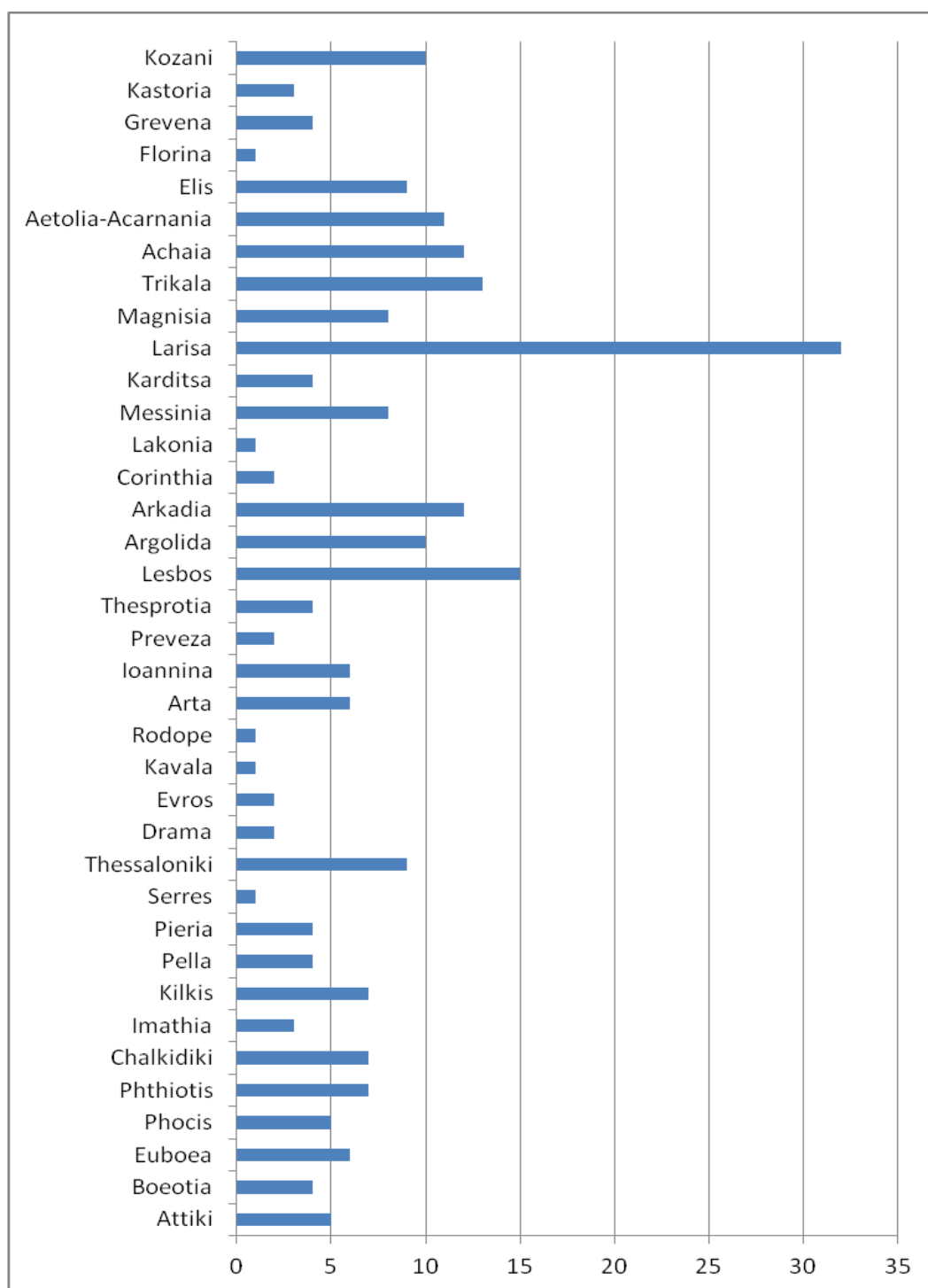


Figure 2.6. Geographical distribution in regional units of processing units licensed to produce, pack and standardize PDO Feta (www.agrocert.gr)

Kasseri (Decision 313027/1994 in FEK 8/B/1994, 101/B/1994 as amended by Decision 379116/200 in FEK 949/B/2000) is a semi-hard yellowish PDO cheese from sheep milk or mixture of sheep with up to 20% goat milk. It is produced in the administrative regions of Western and Central Macedonia and in the regional units of Drama Kavala, Xanthi and Lesbos. There are totally 38 processing units licensed to produce, pack and standardize Kasseri, located as shown in Figure 2.7. Moreover, there is one unit only standardizing PDO Kasseri in Arta, Epirus, 12 enterprises that are licensed only to pack, standardize and trade Kasseri (7 in Attiki, 2 in Magnisia and one in each of the regional units of Aetolia-Acarnania, Boeotia and Karditsa) and 13 enterprises only licensed

to trade Kasseri (10 in Attiki, and one in each of the regional units of Thessaloniki, Larisa and Xanthi) (Agrocert, 2014). A quite significant rise was observed in the production of Kasseri in 2010, but ever since it has been steadily falling (Table 2.4). This cheese is particularly prevalent in the northern mainland of Greece, where it is produced.

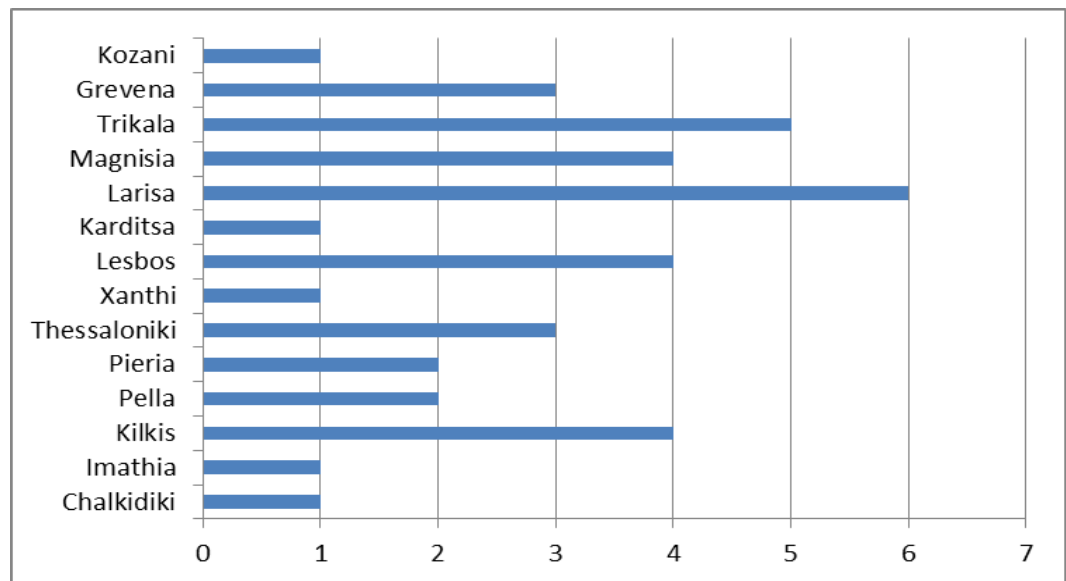


Figure 2.7. Geographical distribution of processing units licensed to produce, pack and standardize PDO Kasseri (www.agrocert.gr)

Kefalograviera (Decision 313032/1994 in FEK 8/B/1994, 101/B/1994) is a hard white to yellowish PDO cheese made from sheep milk or mixture of sheep with up to 10% goat milk. It is produced in the administrative regions of West Macedonia and Epirus and in the regional units of Aetolia-Acarnania and Evrytania. There are totally 38 processing units licensed to produce, pack and standardize Kefalograviera, located as shown in Figure 2.8. Moreover, there are 14 enterprises licensed only to pack, standardize and trade Kefalograviera (8 in Attiki, 2 in Magnisia and one in each of the regional units of Boeotia, Karditsa Thessaloniki and Pella) and 11 enterprises licensed only to trade Kefalograviera (9 in Attiki, one in Thessaloniki and one in Larisa). The production of Kefalograviera has remained relatively steady throughout the years (Table 2.4).

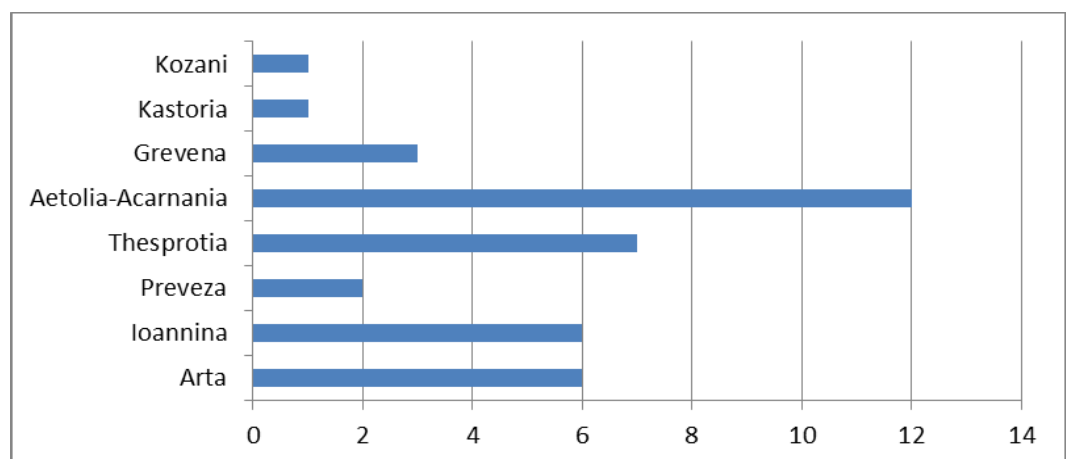


Figure 2.8. Geographical distribution of processing units licensed to produce, pack and standardize PDO Kefalograviera (www.agrocert.gr)

Graviera Kritis (Decision 313047/1994 in FEK 16/B/1994) is a hard yellowish PDO cheese from sheep milk or mixture of sheep with up to 20% goat milk. It is produced in the administrative

region of Crete. There are totally 19 processing units licensed to produce, pack and standardize this PDO cheese, located as shown in Figure 2.9. Moreover, there are 12 enterprises licensed only to pack, standardize and trade Graviera Kritis (6 in Attiki and one in each of the regional units of AetoliaAcarnania, Boeotia, Heraklion, Karditsa, Magnisia and Rethymno) and 8 enterprises licensed only to trade Graviera Kritis (5 in Attiki, 2 in Thessaloniki and one in Heraklion) (Agrocert, 2014). Although a significant fall in Graviera Kritis production was observed in 2009, the produced quantities are rising steadily ever since (Table 2.4).

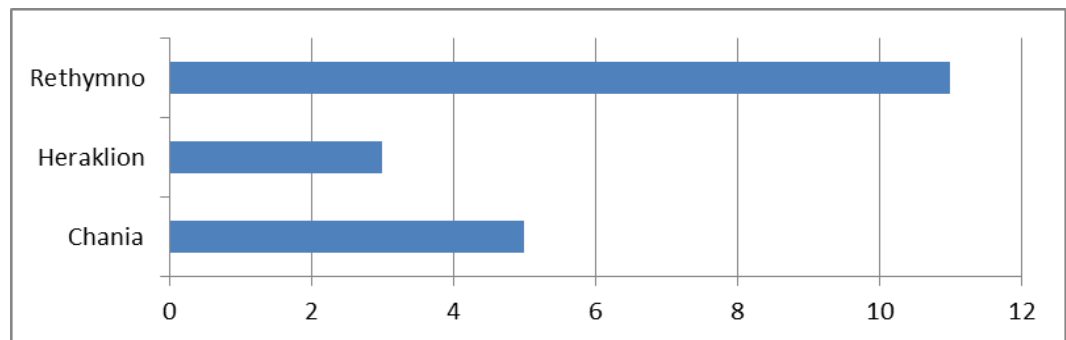


Figure 2.9. Geographical distribution of processing units licensed to produce, pack and standardize PDO Graviera Kritis (www.agrocert.gr)

Graviera Naxou (Decision 313071/1994 in FEK 23/B/1994) is a hard yellowish PDO cheese made from cow milk or mixture of cow with up to 20% sheep and goat milk. It is produced in the island of Naxos, regional unit of Cyclades. There are totally 3 processing units licensed to produce, pack and standardize this Graviera Naxou. Moreover there are 8 enterprises licensed only to pack, standardize and trade it (6 in Attiki, 1 in Boeotia and 1 in Magnisia) and one enterprise in Larisa only licensed to trade Graviera Naxou (Agrocert, 2014). The production of this cheese rose significantly until 2010, then a slight fall was noticed in 2011 and it has been rising again ever since (Table 2.4).

Manouri (Decision 313028/1994 in FEK 8/B/1994 and 101/B/1994) is a soft white PDO cheese made from the whey of either goat, sheep or mixture of goat with sheep milk with an addition of sheep or goat milk or their cream. It is produced in the administrative regions of Central Macedonia, Western Macedonia and Thessaly. There are totally 29 processing units licensed to produce, pack and standardize Manouri located as shown in Figure 2.10. Moreover there are 10 enterprises licensed only to pack, standardize and trade it (4 in Attiki, 3 in Magnisia, 2 in Boeotia and one in Aetolia-Acarnania) and 12 enterprises only licensed to trade Manouri (9 in Attiki, and one in each of the regional units of Arta, Thessaloniki and Kilikis) (Agrocert, 2014). The production of Manouri has remained relatively steady throughout the years, although a small fall was noticed from 2011 and on (Table 2.4).

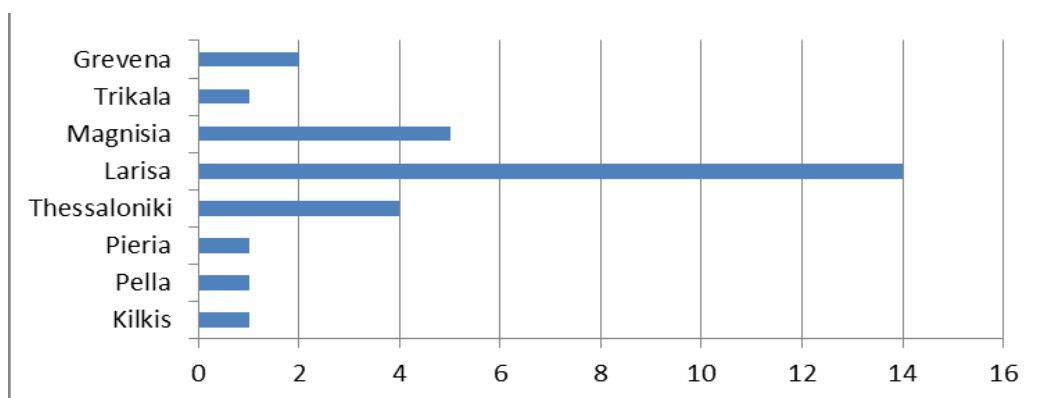


Figure 2.10. Geographical distribution of processing units licensed to produce, pack and standardize PDO Manouri (www.agrocert.gr)

Kalathaki Limnou (Decision 313044/1994 in FEK 16/B/1994) is a soft white PDO cheese ripened in brine from sheep milk or mixture of sheep with up to 30% goat milk. It is produced in Limnos Island, regional unit of Cyclades. There are totally 3 processing units licensed to produce, pack and standardize Kalathaki Limnou. Moreover, there is one enterprise in Chalkidiki licensed only to pack, standardize and trade it and 2 enterprises (one in Thessaloniki and one in Attiki) licensed only to trade Kalathaki Limnou (Agrocet, 2014). The production of Kalathaki Limnou decreased significantly in 2010. This fall was followed by a small rise, the production reached its higher quantities in 2012 and it fell significantly again in 2013 (Table 2.4).

Ladotyri Mytilinis (Decision 313058/1994 in FEK 25/B/1994 and FEK 101/B/1994) is a hard white to yellowish PDO cheese from sheep milk or mixture of sheep with up to 30% goat milk. It is produced in Lesbos Island, regional unit of Lesbos. There are totally 10 processing units licensed to produce, pack and standardize Ladotyri Mytilinis. Moreover, there are 4 enterprises licensed only to pack, standardize and trade Ladotyri Mytilinis (3 in Attiki and one in Boeotia) and 2 enterprises in Thessaloniki licensed only to trade Ladotyri Mytilinis (Agrocet, 2014). The produced quantities of Ladotyri Mytilinis have been relatively steady until 2010 and a quite significant increase was observed in 2012 (Table 2.4).

Katiki Domokou (Decision 313048/1994 in FEK 16/B/1994 and FEK 101/B/1994) is a soft white spreadable PDO cheese from goat or mixture of goat with sheep milk. It is produced in the plateau of Orthys, Domokos district, regional unit of Phthiotis. There are totally 2 processing units licensed to produce, pack and standardize Katiki Domokou (Agrocet, 2014). A significant increase of Katiki Domokou production was observed in 2009 remaining relatively steady ever since (Table 2.4).

Galotyri (Decision 313031/1994 in FEK 8/B/1994 and FEK 101/B/1994) is a soft white spreadable PDO cheese from goat, sheep or mixture of goat with sheep milk. It is produced in the administrative regions of Thessaly and Epirus. There are totally 2 processing units licensed to produce, pack and standardize Galotyri, located as shown in Figure 2.11. Moreover, there is one enterprise in Attiki licensed only to trade Galotyri (Agrocet, 2014). The production of Galotyri has been decreasing steadily from 2008 and only a small rise was noticed in 2013 (Table 2.4).

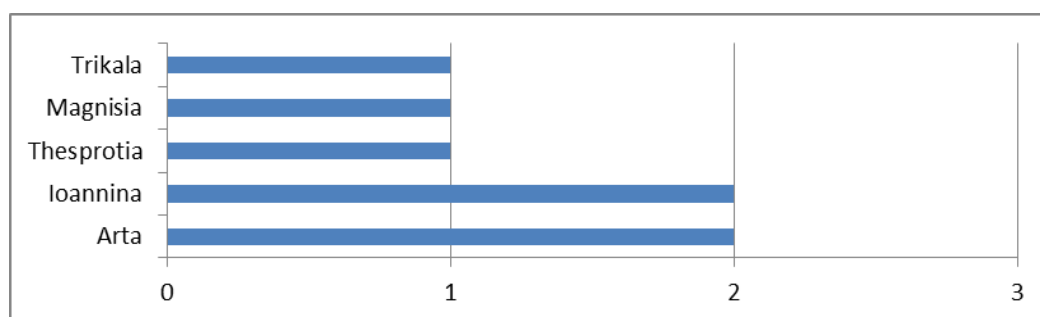


Figure 2.11. Geographical distribution of processing units licensed to produce, pack and standardize PDO Galotyri (www.agrocet.gr)

Sfela (Decision 313051/1994 in FEK 25/B/1994) is a semi-hard white to yellow PDO cheese ripened in brine from either goat, sheep or mixture of goat with sheep milk. It is produced in the regional units of Messinia and Lakonia, administrative region of Peloponnese. There are totally 5 processing units licensed to produce, pack and standardize Sfela in Messinia (Agrocet, 2014). The production of Sfela has been always restricted to very small quantities that have remained relatively steady throughout the years (Table 2.4).

Xynomyzithra Kritis (Decision 313051/1993 in FEK 18/B/1994 and 101/B/1994) is a soft white PDO cheese made from the whey of either goat or sheep or mixture of goat with sheep milk. It is produced in the administrative region of Crete. There are totally 7 processing units licensed to produce, pack and standardize this PDO cheese (5 in Rethymno and 2 in Heraklion). Moreover, there is one enterprise in Heraklion licensed only to pack, standardize and trade and one enterprise in Attiki licensed only to trade Xynomyzithra Kritis (Agrocet, 2014). Xynomyzithra is produced in

small quantities. A rise was observed in 2010 and ever since production remained relatively steady (Table 2.4).

Batzos (Decision 313057/1994 in FEK 25/B/94 and 101/B/94) is a semi-hard to hard, white to yellowish PDO cheese ripened in brine from goat, sheep or mixture of goat with sheep milk. It is produced in Western and Central Macedonia (regional units of Thessaloniki, Chalkidiki, Kilkis, Imathia, Pieria, Pella, Florina, Kozani, Kastoria, Grevena) and in Thessaly (regional units of Larisa, Trikala, Karditsa, Magnisia). There are 14 processing units in total licensed to produce, pack and standardize Batzos, located as shown in Figure 2.12. The produced quantities of Batzos have remained relatively steady until 2012, when a decline was observed (Table 2.4).

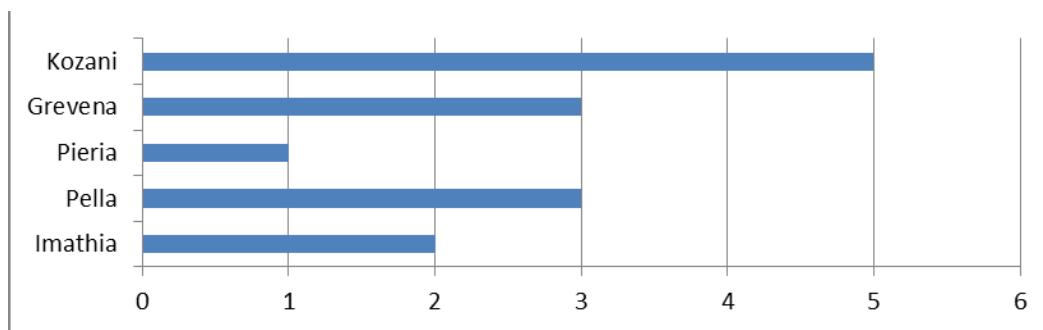


Figure 2.12. Geographical distribution of processing units licensed to produce, pack and standardize PDO Anevatocheese (www.agrocert.gr)

Formaella Arachovas Parnassou (Decision 313063/1994 in FEK 25/B/1994) is a semi-hard yellowish PDO cheese from either goat or sheep or mixtures of goat with sheep milk. It is produced in Arachova Parnassou district, regional unit of Boeotia. There are totally 10 processing units licensed to produce, pack and standardize Formaella Arachovas Parnassou. Moreover, there are 2 enterprises licensed only to pack, standardize and trade Formaella Arachovas Parnassou (one in Attiki and one in Phthiotis) (Agrocert, 2014). Formaella Arachovas Parnassou had been produced in minor quantities until 2012, when a rise was observed (Table 2.4).

Pichtogalo Chanion (Decision 313062/1994 in FEK 24/B/1994) is a soft white to whitish spreadable PDO cheese from goat, sheep or mixture of goat with sheep milk. It is produced in the regional unit of Chania, administrative region of Crete. There is only one processing unit licensed to produce, pack and standardize Pichtogalo Chanion (Agrocert, 2014). Pichtogalo Chanion had been produced in very small quantities until 2010, when an increase was observed and ever since they have remained steady (Table 2.4).

Anevato (Decision 313160/1994 in FEK 24/B/1994) is a soft white PDO cheese from goat, sheep or mixture of goat with sheep milk. It is produced in the regional unit of Grevena (Western Greece) and in Voio County of the regional unit of Kozani (Western Greece). There are totally 5 processing units licensed to produce, pack and standardize (4 in Grevena and 1 in Kozani) and one enterprise in Kozani licensed only to pack, standardize and trade Anevato (Agrocert, 2014). The produced quantities have remained steady and low throughout the years (Table 2.4).

Kopanisti (Decision 313046/1994 in FEK 16/B/1994 and 101/B/1994) is a soft yellowish to grayish salty spreadable PDO cheese from either cow or sheep or goat milk or mixtures of them. It is produced in the regional unit of Cyclades. There are totally 4 processing units licensed to produce, pack and standardize and one enterprise in Boeotia licensed only to pack, standardize and trade Kopanisti (Agrocert, 2014).

Kopanisti had been always produced in small quantities but since 2012 the production significantly declined to minor quantities (Table 2.4).

San Michali (Decision 313069/1994 in FEK 23/B/1994 and 101/B/1994) is a hard white to yellowish PDO cheese from cow milk. It is produced in the island of Syros, regional unit of Cyclades. There are totally 2 processing units licensed to produce, pack and standardize and one enterprise in Attiki licensed only to trade San Michali (Agrocert, 2014). The production of San Michali had been low, in 2010 the quantities became double as much as before and the next year the quantities went back to their former levels. No production was observed in 2012 and a very small production returned in 2013 (Table 2.4).

Graviera Agrafon (Decision 313045/1994 in FEK16/B/1994 and 101/B/1994) is a hard yellowish PDO cheese from sheep milk or mixture of sheep with up to 30% goat milk. It is produced in Agrafa district, regional unit of Karditsa. There is only one enterprise licensed to produce, pack and standardize Graviera Agrafon (Agrocet, 2014). Only in 2012 a minor quantity of Graviera Agrafon was produced (Table 2.4). **Xygalo Sitias** (Decisions C312/2010 and L200/2011) is a soft white spreadable PDO cheese from goat, sheep or mixture of goat with sheep milk. It is produced in the district of Sitia, regional unit of Lasithi. No enterprise produced Xygalo siteias in 2014, according to ELOGAK. No production of Xygalo Sitias has been recorded by ELOGAK (Table 2.4).

Metsovone (Decision 313070/1994 in FEK 23/B/1994) is a semi-hard to hard yellow to sepia smoked PDO cheese from cow milk or mixture of cow with up to 20% sheep and goat milk. It is produced in Metsovo County, regional unit of Ioannina. No enterprise produced Metsovone in 2014, according to ELOGAK. No production of Metsovone has been recorded by ELOGAK (Table 2.4).

2.4.2. Traditional non-PDO Greek cheeses

In Greece, a significant number of traditional cheeses are being currently produced (Table 2.5), although none of them is designated with the recently enshrined appellation "milk-based product with traditional characteristics" (Decision 3724/162303 in 22.12.2014). Besides, no dairy product in Greece has been designated with any of the appellations of "Protected Geographical Indication, PGI" or "Traditional Specialties Guaranteed, TSG", although many of these products fulfill the requirements or could take actions in order to fulfill them. It should be pointed out that the areas in Greece with the wider variety of PDO and traditional non-PDO cheeses produced are the Islands, namely North Aegean Islands, the Cyclades, the Dodecanese and Crete.

Table 2.5. Traditional non-PDO cheeses

Cheese	Milk	Geographical origin	Cheese	Milk	Geographical origin
<i>Anthotyros</i>	sheep and goat whey and milk	Mainland of Greece and Crete	<i>Skyriano</i>	sheep and goat	Skyros island (Euboea, Attica)
<i>Klotsotyri</i>	sheep and goat buttermilk	Epirus and Thessaly	<i>Tsakisti Myzithra Limnou</i>	sheep and/or goat	Limnos (N.Aegean)
<i>Myzithra</i>	sheep and/or goat and/or cow milk and whey	Nationwide	<i>Melichloro Limnou</i>	sheep and goat	Limnos (N. Aegean)
<i>Telemes</i>	sheep and/or goat and/or cow	Mainland of Greece	<i>Dermatotyri Samou</i>	sheep and goat	Samos (N.Aegean)
<i>Tsalafouti</i>	sheep and goat	Agrinio (Aetolia-Acarnania)	<i>Armogalo Samou</i>	goat	Samos (N. Aegean)
<i>Tyroglia</i>	sheep	Pindos (Epirus)	<i>Pityano Chiou</i>	sheep or sheep and goat	Chios (N. Aegean)
<i>Victoria</i>	cow	Macedonia	<i>Kathoura Ikarias</i>	sheep or goat	Ikaria (N. Aegean)

<i>Nivato Verdikousas</i>	goat	Verdikousa (Elassona, Larisa)	<i>Mastelo</i>	cow	Chios (N. Aegean)
<i>Touloumotyri</i>	sheep and/or goat	Macedonia, Epirus, North Aegean	<i>Sitaka</i>	sheep and/or goat	Kasos and Karpathos (Dodecanese)
<i>Formaella Kalavryton</i>	sheep and goat	Kalavryta (Achaia)	<i>Ellaike Kasou</i>	sheep or goat	Kasos (Dodecanese)
<i>Oudra</i>	sheep or goat whey	Epirus	<i>Manouli Karpathou</i>	sheep or sheep and goat	Karpathos (Dodecanese)
<i>Gais Pontou</i>	cow	Kilkis and Thessaloniki	<i>Possias Ko or Krasotyri</i>	sheep and/or goat	Kos (Dodecanese)
<i>Percharotyri Pontou</i>	cow	Kilkis and Thessaloniki	<i>Armeksia Androu</i>	sheep and/or goat	Andros (Cyclades)
<i>Metsovella</i>	sheep and goat and cow	Metsovo (Ioannina)	<i>Malaxia Androu</i>	sheep and/or goat	Andros (Cyclades)
<i>Metsovana</i>	cow	Metsovo (Ioannina)	<i>Volaki</i>	cow	Tinos and Andros (Cyclades)
<i>Vlachotyri</i>	sheep and/or cow	Metsovo (Ioannina)	<i>Petroto</i>	sheep and/or goat	Tinos and Andros (Cyclades)
<i>Fontina</i>	cow	Epirus	<i>Graviera Tinou</i>	cow	Tinos (Cyclades)
<i>Metsovisio-Katsikisio</i>	goat	Metsovo (Ioannina)	<i>Malathouni or Sklavotyro</i>	cow	Tinos (Cyclades)
<i>Simpoukoukira</i>	sheep and goat buttermilk	Leonidio (Kynouria, Arcadia)	<i>Vrasto Tinou</i>	sheep or sheep and goat	Tinos (Cyclades)
<i>Sirna</i>	goat	Driva (Central Macedonia)	<i>Xino</i>	goat	Ios and Tzia (Cyclades)
<i>Soulougouni from Pontos</i>	cow	Central Macedonia	<i>Skotyri Iou</i>	sheep	Ios (Cyclades)
<i>Galomyzithra</i>	sheep and goat	Central Greece and Crete	<i>Manoura Sifnou</i>	sheep or goat	Sifnos (Cyclades)
<i>Malaka</i>	sheep or sheep and goat	Crete	<i>Gyloto Folegandrou</i>	goat	Folegandos (Cyclades)
<i>Tyrozouli</i>	goat	Crete	<i>Chloro</i>	sheep and/or goat	Santorini (Cyclades)
<i>Kefalotyri Kritis</i>	sheep or sheep and goat	Crete	<i>Graviera Parou</i>	cow	Paros (Cyclades)
<i>Staka</i>	sheep and/or goat cream	Crete	<i>Tyrovolia Mykonou</i>	cow	Mykonos (Cyclades)

<i>Kefalotyri Corfu</i>	cow	Corfu (Ionian Islands)	<i>Ksinotyri Naxou</i>	sheep and goat	Naxos (Cyclades)
<i>Ladograviera Zakynthou</i>	sheep and goat	Zakynthos (Ionian Islands)	<i>Arseniko Naxou</i>	goat	Naxos (Cyclades)
<i>Ladotyri Zakynthou</i>	sheep and goat	Zakynthos (Ionian Islands)	<i>Thilikotyri Naxou</i>	goat whey	Naxos (Cyclades)
<i>Prentza Kefallinias</i>	sheep and goat	Kefallonia (Ionian Islands)	<i>Afromyzithra Naxou</i>	sheep and/or goat whey	Naxos (Cyclades)
<i>Kefalotyri Kefallinias</i>	sheep and goat	Kefallonia (Ionian Islands)	<i>Agourgiano</i>	goat	Gyaros (Cyclades)
<i>Fratsia Kythiron</i>	cow	Kythira island (Attica)	<i>Kalathi Kimolou</i>	sheep and goat	Kimolos
<i>Mytato Kythiron</i>	sheep and goat	Kythira island (Attica)	<i>Anthotyro Anafis</i>	sheep and goat	Anafi (Cyclades)
<i>Ptharisio Skyrou</i>	sheep and goat	Skyros island (Euboea, Attica)	<i>Kefalisio Spilias Milou</i>	sheep and/or goat	Milos (Cyclades)

Chapter 3. e-Commerce

3.1. e-Commerce worldwide

Due to the extensive dissemination of the internet worldwide, electronic commerce (e-commerce) has quickly spread among businesses and households. There are significant differences regarding the degree of acceptance of e-commerce among various regions of the world, with Asia and the Pacific region being the leaders in terms of e-commerce purchase activity. Europe has the lowest performance worldwide in terms of e-commerce users for purchase actions. The same is valid regarding the intention for e-commerce use in the near future, especially when compared with Asia and the Pacific region, the Middle East, Africa and Latin America (Nielsen, 2015). According to the same survey, the sales of liquid milk between 2013 and 2014 in China increased by 91%, with 2% being carried out through e-commerce. Reasons for the increase of on-line shopping for Fast Moving Consumer Goods (FMCG) in the Asia-Pacific region include the rapid pace of urbanization, low labor costs and food safety concerns. On-line Consumer Packaged Goods (CPG) sales has been driven by the enthusiasm and shopping ingrained behavior of Millennials (21-34 year of age) and Generation X (35-49) who grew up in the era of digital technology. These two categories are most willing to use ecommerce in the future and thus they should be targeted by every company dealing with food (Nielsen, 2014). The intention of the consumers is depicted in Figure 3.1.

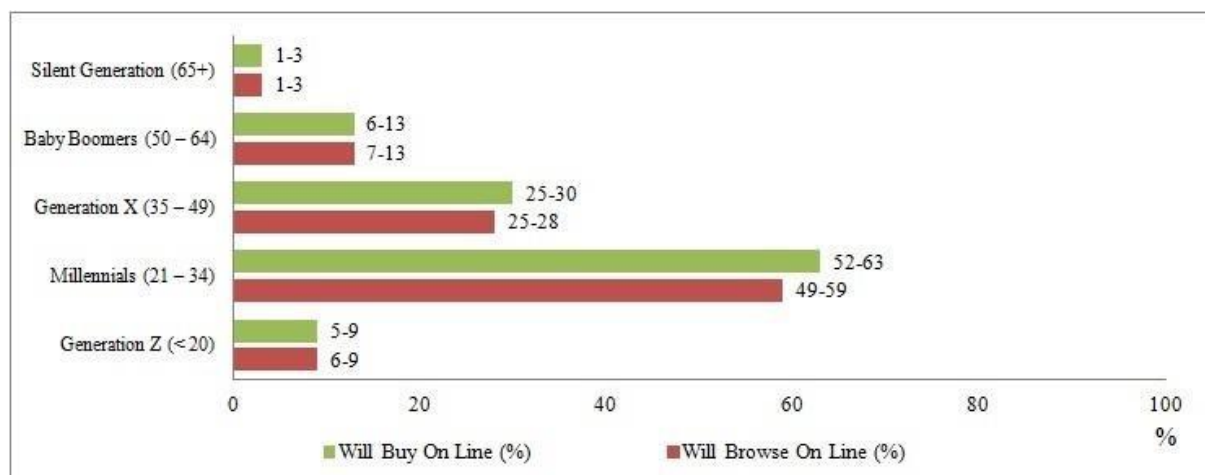


Figure 3.1. Intention of the consumers for buying and browsing in 2014 (Nielsen, 2014)

Food products in which the e-commerce suits the most are those that meet specific consumer needs, such as those having beneficial characteristics for human health along with fresh or minimal processed foods. Price is also an important factor that should be considered especially under the current economic crisis conditions. Products with high profit margins and high price to weigh ratio are well suited for ecommerce. General strategies for e-commerce success include:

1. Insist on reliability and meeting the consumer's needs
2. Ease of use
3. Targeting specific market consumers
4. Easy receiving orders, payments and carefully planned distribution

E-commerce should form an innovative communication and commercial practice for companies that aim to increase their sales both locally and internationally. Unfortunately, however, some companies are not always open to implement major changes or innovations in practices regarding marketing and distribution.

Basic targeting for food companies, especially local SMEs, should be the information interface for the locality and the traditional identity of their products, while innovative products

should be highlighted as well. The successful communication of this combination will give higher added value to the company's products, competitive advantage and will encourage the trust of consumers. On the other hand, the two main reasons of failure to create a successful e-commerce business is the inability of the operators to provide users with basic accessibility and usability features (Bodini and Zanolli, 2009).

3.2. e-Commerce in Greece

3.2.1. Households and Consumers

According to the Greek Statistical Service ELSTAT (2014), in the first quarter of 2014 for a sample of 4.129 private households, with equal number of members and at least one of them in the age group 16-74, it was shown that e-commerce had an important growth. Consumers who have made on-line purchases in 2014 increased by 9.3% compared to 2013 and this accounts today for the 29.5% of internet users. From one purchase per month in 2013 there was an increase to three purchases per two months in 2014. Moreover, there was an increase of about 10% in total number of product categories purchased this period (Table 3.1).

Table 3.1. Internet users making online purchases (%) (ELSTAT, 2014)

Year	2008	2009	2010	2011	2012	2013	2014
On-line purchases (%)	13,7	16,2	18,4	23,6	26,9	27,0	29,5

The number of women using the internet to purchase products or place orders through has been increasing since 2010. Therefore, the difference between men and women has decreased down to 6.6% in 2014 (Table 3.2).

Table 3.2. Electronic purchases leaf base from 2010-2014 (ELSTAT, 2014)

2010		2011		2012		2013		2014	
Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
65,20%	34,80%	60,70%	39,30%	56,90%	43,10%	55,80%	44,20%	53,30%	46,70%

Overall, the percentage of consumers' profiles making on-line purchases by gender, age group and educational level are shown in Figure 3.2. In terms of education, among low educational level group the rate was doubled from 4.1% to 9.5% between 2012 and 2014. For the medium educational level group, i.e. graduates of secondary education and training institutes, the on-line activities remained rather stable ranging from 40.2% in 2012 to 38.7% in 2014.

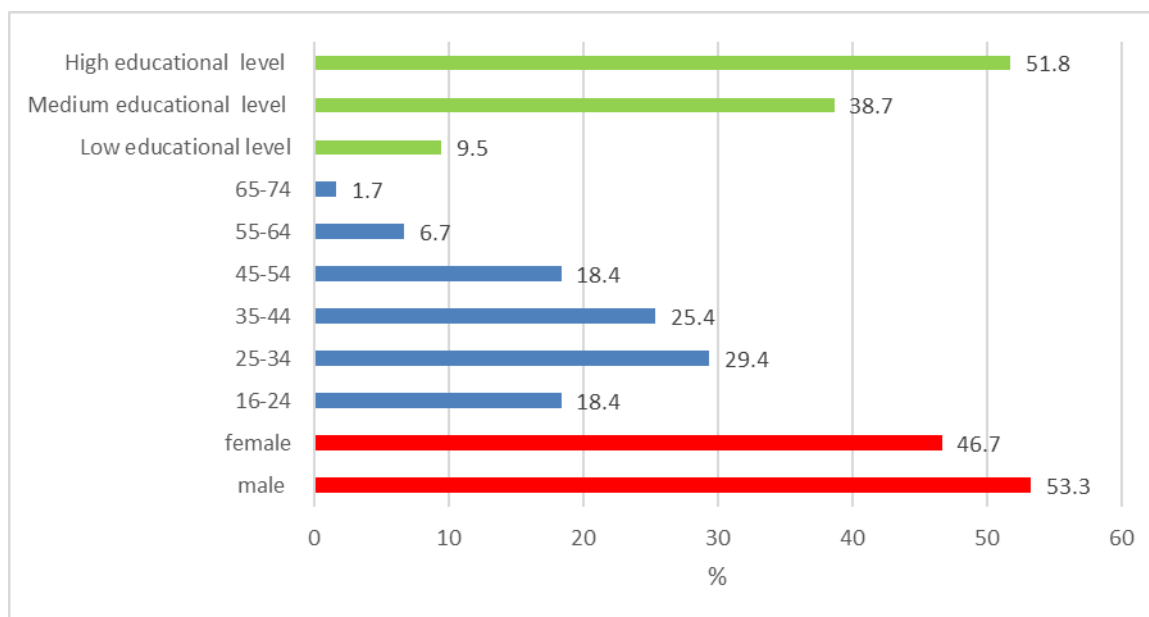


Figure 3.2. Share in e-commerce per gender, age group and educational level in 2014 (Nielsen, 2014)

In terms of growth, products or food and grocery services had a remarkable growth in 2012 compared to 2011, namely by 25%. This was the 4th best class development after the medical drugs (increase by 36.1%), the clothing sector & sports equipment (increase by 28%) and e-learning material (increase by 27.5%). The market share of food and grocery items in 2012 reached 6.5% of the total on-line shopping.

No growth was however observed in the first quarter of 2014, in contrast to the medical drugs and the clothing sector, which grew in 2013 more rapidly, namely by 101.9% and 41%, respectively. The same survey (ELSTAT, 2014) for the first quarter of 2014 showed that 73.3% of the consumers preferred domestic enterprises to make electronic transactions while 40.0% preferred EU countries and 21.0% countries outside the EU. Interestingly, 3.9% of the consumers did not know the origin of the vendors.

Although transactions *via* credit cards, in general, do not necessarily overlap with e-commerce transactions, it is worth to note that, according to data from Greek financial institutions, e.g. banks, after the imposition of the capital controls in Greece, more than 1.1 million new credit cards were issued in the period June-August 2015 and the use of more than 11 million credit cards in total has tripled. In 2014, the use of credit cards represented 1 euro for every 33 euro of purchase, much lower than in the EU, which is 1 euro for every 6 euro of purchase, and this difference is estimated to have fallen significantly since the implementation of capital controls. The use of credit cards in the food market jumped to 234% over the same period. Moreover, after the implementation of capital controls, the Greek companies operating through ecommerce experienced problems with payments and receipts (97%), problems in production and distribution of goods (64%), an inability to use payment methods, such as PayPal (61%), and they claim that 29% of their clients refuse to pay cash (ELSTAT, 2014).

3.2.2. Enterprises

The use of information technologies, including personal computer, internet access and websites from a total of 23.098 businesses, is illustrated in Figure 3.3 for the years 2013 and 2014. A total of 20.578 enterprises had internet access while 14.287 had their own website. In a survey of ELSTA ELSTAT (2014), which included 23.098 enterprises, the total turnover amounted 219.830.219,941 euro, with the electronic sales totaling 3,504,355,491 euro for 2132 businesses, banks being excluded. Moreover, 9.23% of the enterprises received electronic orders

corresponding to 1.59% of the total turnover, an increase of 9.12% compared to 2013 regarding the number of companies and 1.21 % regarding the turnover rate. In 2014, companies made less on-line purchases, i.e. 13.66%, compared to 2013 (18.14%).

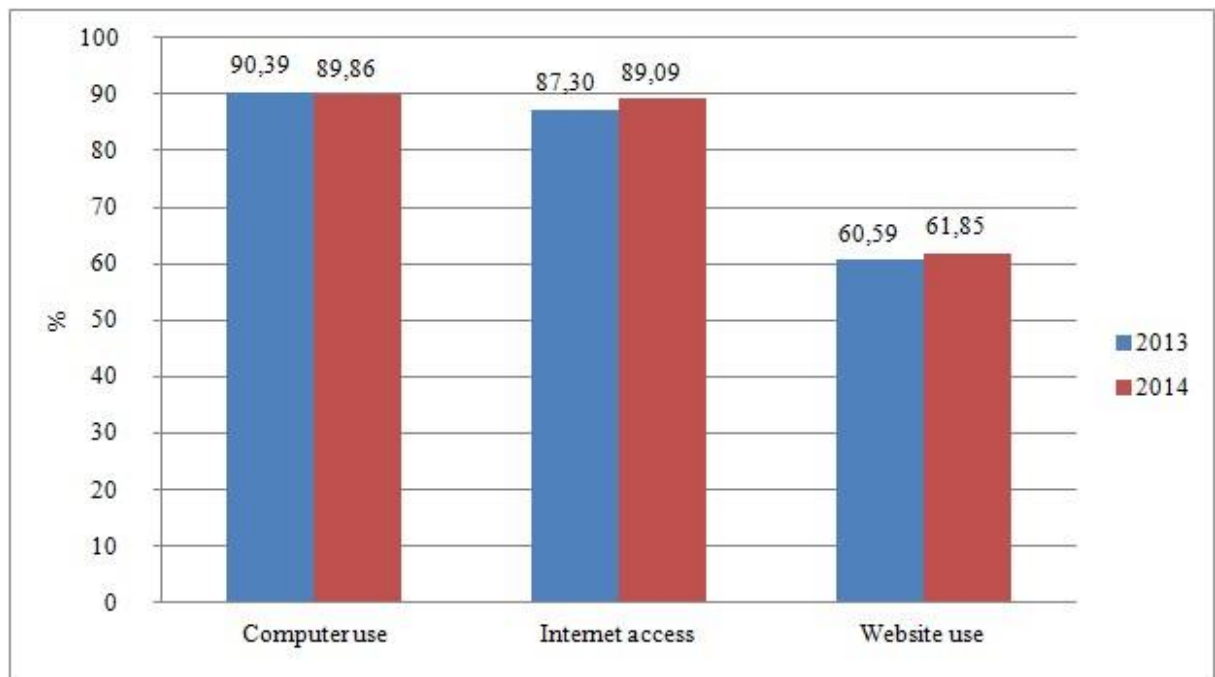


Figure 3.3. Computer use, internet access, use of websites from all Greek companies (%) (ELSTAT, 2014)

From the questionnaire used in the present study, on the query whether they have a website or use on-line advertisement, among the 69 dairy units' owners 73.9% confirmed the use of a website. Among them, 54% claimed that the website had a positive effect on their business, 36% did not see any significant difference and 10% did not notice any improvement.

Chapter 4. Agrotourism and the dairy sector

4.1. Agrotourism at global, European and Greek level

Agrotourism is a specific practice of rural tourism and thus a significant development strategy of disadvantaged areas in the European Union. Agrotourism contributes, among others, to the improvement of farmers' income, the promotion of entrepreneurship, the restraint of the rural population in the place of residence and the trade of agricultural products (www.minagric.gr). One of the main objectives of agrotourism is to preserve the physical environment and in this sense proper planning is a prerequisite for a smooth development.

Globally, the US has the most long-term development path of agrotourism that appeared during the 1960s. Moreover, remarkable growth is observed in China, Japan and Australia. At European level, the development of agrotourism is a guiding policy of the EU and as a result many European producers implement agrotourism practices and generate big revenues (Kazantzidou, 2014). It is implemented with great success over the past 30 years and is constantly evolving and improving. Nowadays, the number of agrotourism units exceeds 600.000, fact that proves the positive attitude of most European countries towards the development of agrotourism (Tsapaki, 2011).

In Greece, agrotourism developed substantially in recent years, namely, from 1991 onwards, by applying tourism investments in the framework of the structural policy of the EU and in particular with the Community Initiatives, Leader I, II and Leader plus. The main body in Greece for agrotourism development is the public sector. Local authorities can also play important role due to their broader experience and knowledge about rural areas. However, decisive factor in the development of agrotourism is the private initiative (Kazantzidou, 2014). Unfortunately, there are no official figures regarding agrotourism businesses in Greece. However, according to estimates, there are 2.500-4.000 companies (www.chania-info.gr).

The classification of a business as an agrotourism one presupposes the acquisition of the special agrotourism brand. It is a brand with a specific logo awarded by the Ministry of Economy, Development and Tourism (www.minagric.gr). The new institutional framework for the operating conditions of agrotourism in Greece has been completed, since the relevant legislation was passed in August 2015 by the Greek parliament. However, according to professionals of the sector, there are many issues to be further discussed and solved as a clear delimitation of agrotourism objects is needed (www.agronews.gr).

4.2. Agrotourism and the Greek dairy sector

The gastronomic wealth of Greece, with the wide variety of traditional products, is an integral part of quality and comprehensive provision of agrotourism. Agrotourism can contribute to the enhancement and the promotion of local products with marks of quality and brand.

With regards to the Greek dairy sector, it should be mentioned that the dairy units providing agrotourism activities are not officially registered. Unfortunately, there are no data regarding their number or location. So far, neither the Ministry of Economy, Development and Tourism nor any public body has ever published any official list including these specific units. However, the better organization of this sector is necessary and the competent bodies should take this into consideration.

At this point it is worth mentioning the initiative of the Hellenic Chamber of Hotels for the "Establishment and promotion of the Greek breakfast". This is a highly innovative action designed and implemented in 2010 and plays an important role in promoting local cheeses and other dairy products of each region along with a number of other traditional products. Through the implementation of the "Greek breakfast" initiative, the visitor has the opportunity to taste a variety of excellent local cheeses, traditional yogurt, goat and sheep milk, sour milk and butter that are locally produced.

It is anticipated that the visitor who tastes the local products will look for and purchase regularly the ones he/she liked the most. Furthermore, the aim of the initiative "Greek breakfast" is not only to enable the visitors to experience the abundant gastronomic richness of Greece but

also give the consumers the opportunity to meet producers and to come in contact with the domestic dairy production (www.greekbreakfast.gr).

Furthermore, an essential part of agrotourism is that the farmer-entrepreneur provides visitors an authentic and first-hand experience regarding food production practices. Thus, the agrotourist would be able to visit a dairy plant and participate, for example, in the process of cheese-making, production of yogurt and other dairy products. This way, the visitor is able to source in place the products of his choice while the unit can have retail sales of the products contributing to their promotion.

In addition, cooperation and coordination between tourism entrepreneurs and representatives of the primary and secondary food sector in each region seems to be necessary. The exchange of experience along with collective actions will contribute to the improvement of services for the benefit of all.

4.3. Prospects for the development of agrotourism in Greece

The Ministry of Economy, Development and Tourism has recently announced the National Strategic Reference Framework (NSRF) 2014-2020, which is expected to significantly contribute to the development of agrotourism. Specifically, the new program covers several strategic areas of action, including the agri-food sector and tourism contributing, thus, to the modernization of existing micro and small businesses but also to the development of healthy startup companies (www.aftodioikisi.gr).

Agrotourism is considered a sector with growth potential and can be an alternative approach in the development of entrepreneurship in rural areas combined with sustainable development. In Greece, there is an untapped potential that can create a particular model of agrotourism in many regions. This potential refers to authenticity and uniqueness in all forms and expressions (www.in.gr).

Despite all the constraints mentioned above, the Tossizza-Averoff Foundation dairy unit located in Metsovo, Epirus can be considered as a shining role model of agrotourism in. Besides milk processing and production of well known and popular dairy products, e.g. the Metsovoone cheese, the unit offers guided tours throughout the production facilities telling the history of the traditional cheese manufacture techniques and ending up with tasting and purchasing the fine cheeses produced there. At least 10.000 visitors each year live the unforgettable experience in the “Katogi Hotel” of the Tossizza-Averoff Foundation, strengthening the local community with other activities as well. Chapter 6 of the present work is dedicated to this unit as an intriguing case study in the dairy sector in Greece.

Chapter 5. Education of prospective milk processors

The prospective milk processors in Greece can either attend long term training programmes or short term seminars carried out by official state educational institutions. Occasionally, short term seminars are even organized by private educational entities.

Dairy Vocational School of Ioannina (Galaktokomiki EPAS Ioanninon). The School operates in the context of the Organization of Agricultural Vocational Education Training and Employment (O.G.E.E.K.A "Dimitra"), which is an organization supervised by the Ministry of Agriculture and Food of the Hellenic Republic aiming at fulfilling the rural populations' needs for education, vocational training and information. The 2-year studies are attended by 60 students per academic year. The curriculum involves both theoretical courses, e.g. Dairy Science and Technology, Dairy, Agricultural Economy, Food Hygiene and Safety, Dairy Processing Units Equipment, Informatics on Dairy Practice, as well as practical training at the cheese dairy plant of the School. Particular emphasis is given on provision of knowledge on design, installation, equipment selection and operation of a contemporary dairy processing unit regardless the size. Moreover, special attention is paid to issues concerning proper packaging, e.g. legislation, methods, materials etc, hygienic production of safe milk-derived aliments and hygiene and safety at the workplace .

Through a range of practical courses, the students are trained on all stages of the manufacturing technology for a wide variety of Greek cheeses, both PDO and nonPDO traditional ones, and other dairy products, and on performing all necessary chemical and microbiological analyses of milk and dairy products. The School receives on a daily basis 400-700 kg of cow and/or sheep and/or goat milk, i.e. approximately 40-45 tons/year, which are used for the practical training of the 2nd year students. More than 50% of the produced dairy products are consumed at the School's restaurant by the students themselves, a big part (2-2,5 tons/year) is granted to charitable foundations and only a small percentage (maximum 10%) is used for the School's public relations and the staff.

The education is supplemented with extra-curriculum workshops and lectures given by acknowledged scientists and professionals. Furthermore, 1-day or several days educational visits at dairy processing units or food exhibitions are organized. Finally, educational visits in the context of the implementation of EU programmes are organized, such as the Lifelong Learning Programme "Leonardo da Vinci".

Students eligible for the School are graduates of at least the first class of the compulsory Secondary Education. Priority is given to young people with parents having farming as the primary occupation, or with at least one year working experience in posts relevant to dairy processing, or originating from mountainous, sylvan or border areas and finally students belonging to special categories, e.g. families with more than three children. All students have access to the School's dormitory with free accommodation and meals.

Nowadays, the vast majority of the applicants have completed all classes of compulsory education and even some cases of higher education graduates have been reported. Until 2010, the applications did not exceed the number of 80, while in some school periods only one class with 30 students or less operated. From 2011 onwards, applications gradually increased, with 150, 170, 210 and 180 applications in the years 2011, 2012, 2013 and 2014, respectively, which proves both the attractiveness of the specific curriculum as well as School's reputation and recognition.

American Farm School. It is a non-profit educational institution, with 2 schools, namely the general high school and the vocational high school, both offering high quality secondary education with a holistic and contemporary approach, cultivating at the same time the environmental awareness.

Concerning the vocational high school educational programme, students with completed primary education are eligible. A post-secondary optional year-long course for further training is available for the graduates that is called provision apprenticeship. The graduates of this school receive a 3rd level specialty degree. Apart from the theoretical education, many laboratories are used for the practical training, which are based on an experiential learning under normal working conditions, enabling students to better assimilate the theory. A special emphasis is also given to English and computer skills. There are 6 study directions, with one on dairy processing entitled "Food and Drinks Technology Technician". Besides the standard courses offered in the context of

the school's educational programme, students attending the aforementioned direction take extra courses and practical training in the laboratories of Food Technology and Dairy Science and Technology.

The students have the opportunity to participate in EU mobilization programmes, so as to visit similar schools around Europe, where they can take extra practical training and even participate in international fairs. They also have the opportunity to participate in educational programmes in Texas, participate in the student-exchange programme "4-H" in the US and attend summer programmes in several Universities in the US.

The vast majority of the students of the vocational high school are boarder students that have received either a full or a partial scholarship. All students can eat at the school's restaurant, which provides four meals daily in very low prices. The ingredients used for the meals mainly derive from the school's laboratories and training farm.

In the context of the American Farming School a Level 2 Lifelong Learning Center operates as well, which is a certified organization by the National Qualification Certification Agency and Vocational Guidance (E.O.P.E.E.P) that is supervised by the Greek Ministry of Education. It carries out open educational programmes that follow the school's principles for qualitative experiential education.

The topics that are relevant with the dairy education are the following; Food Technology, Biosafety, Rural Finance and Administration. In the context of the first topic, three different seminars are available: Milk Processing (all products apart from cheese), Amateurish Cheese making and Professional Cheese making. Attendants of the seminar of Professional Cheese making have the opportunity to participate in exams for the acquisition of the Certified Cheese Making Technician Certificate. The second topic involves seminars that concern not only milk production and dairy technology but also other issues of interest in the agribusiness sector, namely eCommerce of farm products, Standardization of farm products, Costing of farm products, Agrotourism and Countryside tourism, Export Trade and Opening, and Management of Agribusiness. All the aforementioned programmes last one semester, either spring or winter and almost all of them are organized every year upon payment.

Aristotle University of Thessaloniki. Every year, Seminars of Theoretical and Practical Cheese Making are organized in the context of a Lifelong Learning Programme, upon payment. The aim of this open programme is to train participants in cheese manufacturing and to deepen in issues concerning good industrial practices. Special attention is given to problems and defects so as to avoid any possible failures in the final product. Attendants also receive special training in the manufacturing of traditional Greek dairy products, such as traditional Greek yogurt, white brine cheeses (Feta and Teleme), whey cheeses (Myzithra, Anthotyro, Manouri), Graviera, Kefalotyri etc. The participants are also trained in the necessary microbiological and chemical analyses of milk and dairy products.

The seminars are carried out in two courses, A and B. Course A with 36 hours is mainly focusing on theoretical aspects of dairy science and technology. Course B with 64 hours on the other hand includes practical training. Successful completion of course A or certified adequate knowledge in dairy products technology are required for attending course B. A training certificate is obtained upon attending both courses and succeeding in the final exams.

Institute of Agricultural Sciences. It is a public entity under the auspices of Ministry of Rural Development and Food and manages the Legacy of IFIGENIA SYNGROS. It contributes to the development of Greek Agriculture by offering training in specific agricultural topics. Concerning the dairy sector, it organizes every year theoretical seminars in Dairy Technology and Cheese making. The seminars are open and last 120 hours and are upon payment. Further two fast track seminars (80 hours) on "Business planning in Agricultural sector" and "Marketing of Agricultural Products" are also of interest for the dairy sector applicants.

Agricultural University of Athens. So far, the Agricultural University of Athens is occasionally organizing educational seminars at random intervals. The most recent seminar concerning the dairy sector was carried out from September 30th to October 23rd, 2013, under the title "Milk Processing Units". Totally, 94 people attended this seminar. Another interesting seminar entitled "e-Commerce in Agricultural Products' Promotion", was carried out from September 30th to October 12th.

Chapter 6. Baron Michael Tossizza-Averoff Foundation Dairy: A Case Study

Description. Baron Michael Tossizza-Averoff Foundation is a legal body, to which the homonym dairy belongs. It is a private-law charitable foundation run by a 7-member management board. It was founded in 1987 by Evangelos Averoff-Tositsas and its original composition was set by the founder himself. In the context of the foundation also belong other operational entities, such as the Tositsa student dormitory for students from Metsovo in Kifissia, Athens, the Folk Art Museum of Metsovo and Evangelos Averoff Art Gallery in Metsovo. The headquarters of the Foundation are in Athens, 9 Kolokotroni Str., while the dairy is located in the town of Metsovo, regional unit of Ioannina. Metsovo is a mountainous region in an altitude of 1160 meters. The dairy employs 13 people and processes 7-8 tons/day of cow milk throughout the year, 500-600 kg/day of sheep milk when available and 500-600 kg/day of goat milk when available.

History and Tradition. The Baron Michael Tossizza-Averoff Foundation Dairy was founded in 1956 by Evangelos Averoff by using funds from the legacy of Michael Tossizza, who was a rich heirless Greek emigrant in Switzerland. His vision was not just simply create jobs for the local people but to operate a dairy that would have the form of a cheese making school, setting thus an example to the local cheese makers. Evangelos Averoff supported young people of Metsovo, coming from families with a long tradition in livestock breeding and cheese making, to attend cheese making schools in Italy. Many of the apprentices of the foundation's dairy established their own dairies in the region of Epirus. Even nowadays this tradition is still alive; Mr. Tzompikos Giorgos, the head cheese maker of the dairy, whose grandfather was a livestock breeder and who showed from his childhood years an inclination towards his ancestor's activities, was chosen to become the next head cheese maker at the age of 15 by his predecessor. He was fully funded from the Baron Michael Tossizza-Averoff Foundation to attend the American Farm School in Thessaloniki, Greece, and afterwards a cheese making school in Regina, Italy, before returning back to the Baron Michael Tossizza-Averoff Foundation Dairy.

Products. The dairy produces five different kinds of cheeses and also butter. The cheeses that emerged as the crosslink of Greek traditional practices and traditional Italian manufacturing techniques, brought in Metsovo from the scholar cheese makers, were Metsovone, a smoked Pasta Filata cheese named after the Italian Provolone cheese, and Metsovana, the famous extra hard Italian cheese Parmigiano paraphrased in Greek as Parmezana. The cheese makers, who firstly manufactured these cheeses, had chosen to apply techniques similar to the corresponding Italian ones because they believed that their requirements fitted to the produced milk in the mountainous district of Metsovo. **Metsovone.** It is a smoked Pasta Filata cheese from cow milk, rarely mixed with less than 5% of goat milk. It is produced all year around. It is important to mention that although Metsovone was designated as PDO cheese in 1994, six years later the dairy requested the cancellation of the PDO appellation, since it was the only unit allowed to produce this cheese. According to its specifications, the milk should be obtained exclusively from herds around the town of Metsovo. However, the milk produced in this area is often not sufficient for the capacity of the dairy unit, i.e. possessing daily 7-8 tons of cow milk into Metsovone, and in that cases milk from adjacent villages is also obtained. **Metsovana.** It is an extra hard cheese prepared exclusively from cow milk with a ripening time of 2 years and usually produced from May to September. **Graviera.** It is a hard cheese exclusively produced from sheep milk, usually produced May to July. **Metsovella.** It is a semi-hard cheese made from 80% sheep milk, 10% goat milk and 10% cow milk. It is usually produced from December to April. **Gidisio-Metsovisio.** It is a chevre-type cheese prepared from goat milk rarely mixed with less than 5% of sheep milk. It is usually produced from January to July. **Butter.** It is made exclusively cow milk.

The products from the Baron Michael Tossizza-Averoff Foundation dairy enjoy reputation and recognition from the very first years of production, both at local and national level. In particular, Metsovone is one of the most well known and cherished Greek traditional cheeses, with a fame exceeding the limits of the country. Mr. Tzompikos claims that the fame of the dairy's products is due to the uniqueness of their organoleptic characteristics. More specifically, he attributes this uniqueness to two basic parameters, namely milk quality and manufacturing techniques.

Milk quality is the most important parameter. The milk used comes from animals that are bred in Metsovo and in the adjacent villages of Anilio and Votonosi, all belonging to the municipality of Metsovo. When the vegetation is at its best, the animals are grazing in a wide variety of pastures rich in herbs. These herbs contain aroma compounds that confer to milk particular tasting notes, which are then transferred to the final product. Moreover, Mr. Tzompikos himself has full supervision of the animal herds. Moreover, he often performs qualitative analyses of the supplementary feed given to the animals during the months with forage shortage. Furthermore, he makes sure that all these animals are always in perfect hygienic and health conditions. As a result, very few milk batches are found with more than 8.000 total viable bacteria counts. Additionally, the incoming milk has a very good yield, which is attributed to the local breeds' genetic potential regarding protein content. In particular, the % protein content is (a) in cow 3,6, (b) in goat 4,4-4,5 and (c) in sheep 4,8-5,2, during winter time, and 5,9-6,45 during summer for milk from mixed herds. For all the above reasons, the dairy buys the milk in quite satisfying prices, namely

1,12 €/kg for sheep milk, which is normally priced 0,93 €/kg on average (ELOGAK, 2014), 0,60 €/kg for goat milk, which is normally priced 0,56 €/kg on average (ELOGAK, 2014) and 0,65 €/kg for cow milk, which is normally priced 0,43 €/kg on average (ELOGAK, 2014). It should be pointed out that Mr. Tzompikos was concerned about the fact that more and more breeders tend to replace a big part of their animals with non-autochthonous Greek breeds, altering thus the typical quality features of the final products of the unit.

The applied manufacturing techniques are a result of the traditional practices that have been developed over the years in combination with all the contemporary developments in cheese making. The rennet and the starter cultures used are ownproduced.

Key of success. The success of the dairy can be attributed to the full exploitation of the funding provided by the Baron Michael Tossizza-Averoff Foundation and the direct link between the products with the area of Metsovo as a whole. Metsovo is a picturesque mountainous town surrounded by beautiful natural landscapes, which has always been a pole of attraction for tourists, both from Greece and abroad. It also has some interesting sites, such as the Folk Art Museum, the Evangelos Averoff Art Gallery, three old monasteries well preserved, the Averoff Winery and Averoff Botanical Garden. Moreover, it is very close to the city of Ioannina and other towns and villages of Epirus that also attract tourism. It is also an attractive spot for winter sports enthusiasts with ski resort as well as mountain routes passing through the town. Furthermore, Metsovo is famous for its restaurants that are offering exceptional local traditional dishes and roasted meat from local herds. The dairy's connection with the touristic activity of Metsovo is particularly strong:

- The vast majority of the restaurants are obtaining their dairy products from the foundation's dairy and this is indicated in the menu
- A number of hotels serve dairy products from the foundation's dairy at the breakfast. Pretty interesting is the case of Katogi Averoff Hotel, which, apart from serving these products, it is also affiliated with the "Greek Breakfast" initiative
- There are a number of shops, the majority of which are located in the central square of Metsovo, a well-known touristic traffic crossroad. The shops sell traditional food products, mostly hylopites (the local pasta), cheeses and cold cuts. Most shops are selling the cheeses from the foundation's dairy

The aforementioned, in combination with the fact that the dairy is open to tourists and any other kind of visitors strengthen the dairy's connection with its cultural environment, the area's traditional cuisine and gastronomy, and the local hospitality services, which are all aspects of agrotourism activity. Thus, the dairy not only promotes and sells its own products but it also becomes a vital pillar for the development of a continuously growing tourist activity with multiple benefits for the local economic and social development, namely agrotourism. According to Mr. Tzompikos, the biggest part of the dairy's products is sold to the local retailers and retailers and supermarkets in the administrative region of Ioannina. Limited quantities are distributed mostly to retailers and supermarkets in the rest of Greece. Minor quantities are being exported to the EU, through "Ergon", a local brand that promotes Greek traditional products both in Greece and abroad. The recognition of the dairy's products is that big, that the dairy does not have any costs

for the promotion of these products at the top shelves of big supermarket chains. As Mr. Tzompikos claims, the products themselves are an advertisement for the dairy.

Financial data. According to Mr. Tzompikos, Baron Michael Tossizza-Averoff Foundation Dairy is profitable, with 90% of the profits deriving from Metsovone cheese. In particular, this cheese brings profit of 1 €/kg. Metsovisio-Katsikisio is the 2nd most profitable product, followed by Metsovella, Graviera and finally Metsovana.

Conclusions. The dairy's success to reach the market both at local and national level, its connection with the local (agro) touristic activity and its products' recognition having premium characteristics closely affiliated to its mountainous origin make Baron Michael Tossizza-Averoff Foundation Dairy a successful dairy enterprise that could set an example to other dairies in a country with extended mountainous regions.

Chapter 7. Questionnaires: Existing producers and prospective newcomers

For the needs of the present study, two questionnaires were composed, one addressing existing dairy units and one prospective newcomers to the dairy sector. The first one was completed mostly *via* phone contacts and in a lesser degree through personal contacts, while the second one exclusively via internet, i.e. e-mails, social media and targeted web sites. A major problem with the first questionnaire was the reluctance to answer. Moreover, although a significant number (56) of existing dairy unit owners requested the dispatch of the questionnaires to their personal or company e-mail due to lack of time for a phone interview, only 7 of them actually responded. Thus, the sample was at the end relatively small.

7.1. Existing producers

The questionnaire included a range of queries regarding both the current status of the unit as well as plans and willingness to further develop. Out of the 724 existing dairy units in Greece (ELOGAK, 2014), 73 responded eventually to the questionnaire, which makes 10,08% of the total, a rather sufficient ratio to ensure the reliability of the results. The majority were owners of small enterprises, with capacity <1000 tons/yea, that produce only a limited variety of dairy products.

According to the results, 71,1% of the milk processing units have an annual turnover of <2 million euro and 88,9% <10 million euro (Figure 7.1a), which are all considered small enterprises according to the EU legislation (EU Recommendation 2003/361). The majority of the surveyed processing units processed a small annual quantity of milk, namely 43,8% have a maximum capacity of 400 tons/year while 28,8% a capacity from 400-1000 tons/year (Figure 7.1b).

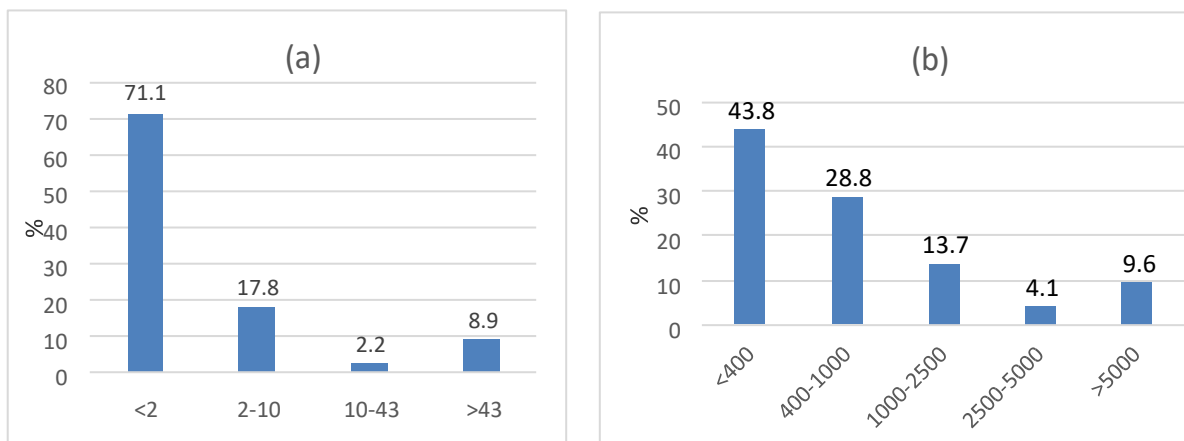


Figure 7.1. Distribution of dairy enterprises according to (a) the annual turnover (in million euro) and (b) the annual capacity (in tons)

Concerning the origin of the incoming milk, 87,5 % of the units obtain the milk needed from livestock breeders and only 12,5 % are own producers. Among the units that buy milk, 86,1% buy it from livestock breeders within the regional unit where the dairy is located, 37,5% from livestock breeders outside their regional unit and 4,2% from the EU. The last units usually are of bigger capacity.

Regarding starter cultures, 87,3% buy the starter cultures used from dedicated companies abroad while only 12,7% use their own cultures. Interestingly, 56,7% are positive towards the perspective to use starter cultures that have been isolated from Greek traditional dairy products, while 23,9% and 19,4% rather hesitate or are completely negative, respectively. It should be noted that the Laboratory of Dairy Research at the Agricultural University of Athens has a dairy starter cultures collection and several strains of this collection are currently commercialized worldwide for yogurt production.

The majority of the enterprises produce only a limited number of dairy products categories, namely 21,9% produce only one category, e.g. cheeses only, 28,8% two categories, e.g. cheese and butter, while 1,4% ten categories, e.g. drinking milk, butter, yogurt, chocolate milk, cream, rice pudding, sour milk, milk-based desserts, cheeses and PDO cheeses (Figure 7.2).

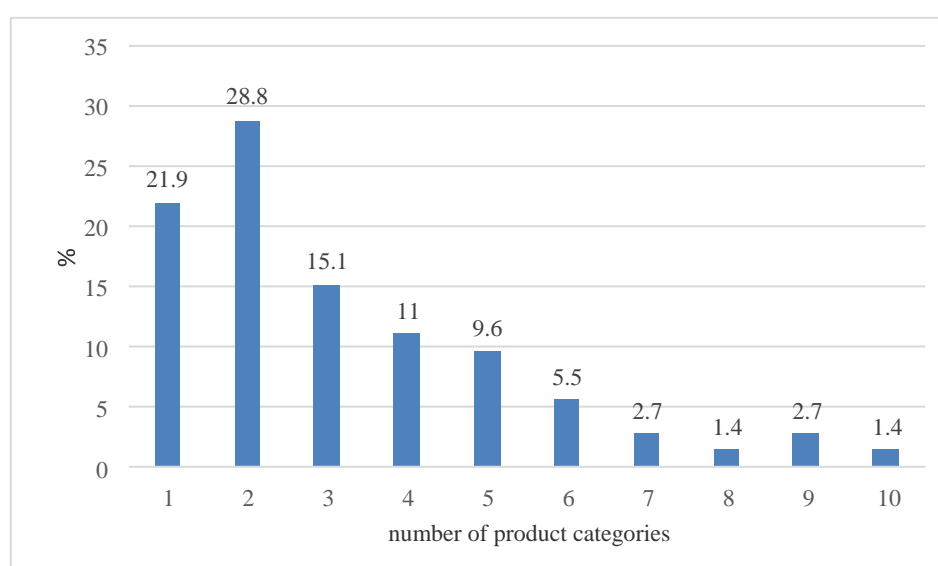


Figure 7.2. Dairy enterprises according to the number of product categories

The majority of the dairy units owners with capacity <400 tons per year believe that their distribution network is not adequate and it needs to be expanded, unlike the rest, who believe that it is adequate enough (Table 7.1).

Table 7.1. Adequacy of the company's distribution network

Annual capacity (in tons)	Adequate	Not adequate
<400	33.9%	66.1%
>400	60%	40%

Most dairy units' owners are being paid by their customers in a short period of time and they also pay their suppliers quite soon (Figure 7.3). In the question whether there have been cases that their customers did not pay them at all, 36,6% answered that this happens very often, 53,5% answered it happens very few times and only 9,9% cases this had never occurred.

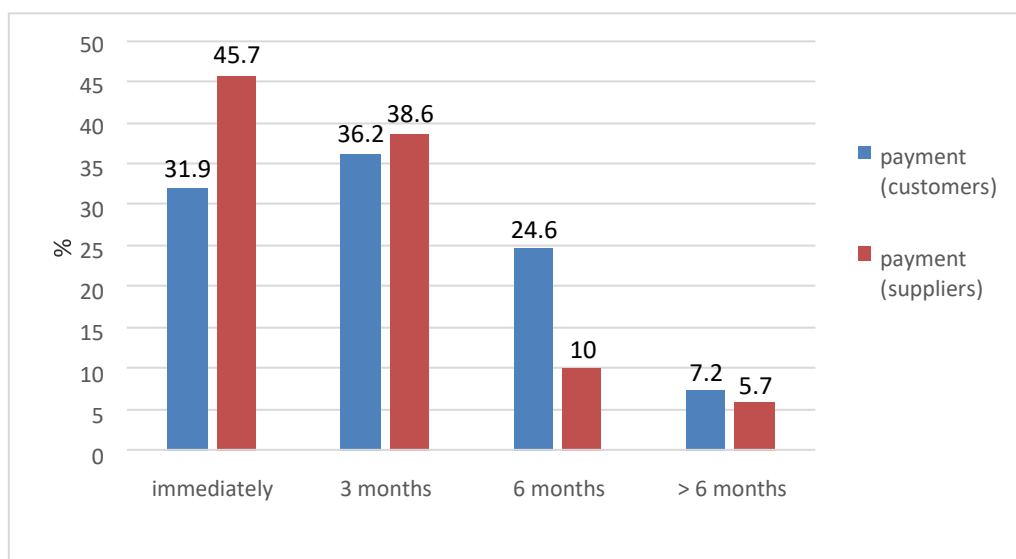


Figure 7.3. Time of payment by customers and to suppliers

While 73,9% of the dairy enterprises have a website, 54% claim that it helped them to promote their products. The majority, namely 79,5%, advertise their companies and products, with 56,2% mostly through their websites and a small percentage through other means.

Almost half (48,3%) of the dairy enterprises with a capacity <400 tons/year and 66,7% of the dairy enterprises with an annual capacity of 400-1000 tons, claim that they have moderate vacant capacity. Concerning those with a capacity of 1000-2500 tons annually, 50% claim that they have no vacant capacity at all, while 30% have moderate vacant capacity. None of the dairy units with capacity > 2000 tons/year claim that they use little or very little of their equipment's capacity.

Concerning the way the entrepreneurs evaluate themselves the infrastructure of their units, 23,9% believe that this is very satisfying and 28,2% satisfying enough, 39,4% moderate and 8,5% not adequate enough. The opposite is recorded concerning the way they evaluate the level of their own know-how, since 34,7% claim that this is perfect, 41,7% very good, 18,1% mediocre and only 4,2% not adequate enough.

Towards the query about the impact of the recent financial crisis in Greece, 56,1% of the entrepreneurs claim that they have been affected either very little or not been affected at all. However, 39,7% said that they have been significantly affected or even affected to such a degree that are intending to suspend the enterprise's operation. Only a 4,1% claimed that the financial crisis affected them positively.

Among the entrepreneurs, 51,5% expressed their willingness to cooperate with other entrepreneurs of the dairy sector, while the rest were either negative or had reservations. This latter observation is indicative of the entrepreneur's suspiciousness towards cooperative ventures and it explains the reason why Greece lacks interprofessional organizations. Among the dairy units that expresses interest in cooperating with other entrepreneurs, 60,4% wish a cooperation at export activities. Interestingly, only 26,4% are interested in cooperating for the development of agrotourism.

The vast majority of the units, namely the 91,8%, expressed their interest in expanding their enterprises, with the majority of them preferring to do this through a subsidy programme, e.g. an ESPA programme.

Apart from answering the questionnaire, many owners of dairy units wanted to express their concerns and comment on the current situation of the dairy sector. Some of the most commonly expressed opinions are quoted below:

- Time-consuming procedure for the issue of operating license with too many bureaucratic requirements

- Difficulty for the issue of planning licenses in case of facilities' expansion
- Differences between the EU legislation and the Greek reality concerning issues, such as waste management and required distances between the processing units and residential areas; the latter was expressed by entrepreneurs on insular regions
- Legislation concerning processing units is the same for small and big enterprises, which is wrong
- Unfair competition by cartels that set low prices to the products and at the same time lower their quality
- Too many and irrational requirements from the PDO certification organization (Agrocert)
- Competition from standardized products, since the cost for standardization is not affordable for small enterprises
- Greek legislation does not take into account the special geographic features in Islands and mountainous regions
- Existence of too many illegal processing units that cause unfair competition and lack of frequent controls from the side of the Hellenic Food Authority (EFET)

7.2. Newcomers

This questionnaire was mainly addressing people interested in creating a new dairy unit, such as livestock farmers, graduates of schools relevant to the dairy sector and people with previous working experience on this sector.

A total of 60 people answered the questionnaire, with 70% being graduates of agricultural schools of various educational levels and 30% livestock farmers. It is interesting to note that 83% of the people with some kind of agricultural education are not currently employed in a position relevant to their studies. This proves the low absorption of agricultural school graduates in the dairy sector most probably due to the current socio-economic conditions in Greece. Concerning the agricultural school graduates' opinion on the dairy sector's current situation, 57,2% have a good or very good opinion (Figure 7.4a). Concerning the agricultural school graduates' estimation of the potential development of the dairy sector, 45,3% of them consider that there will be a positive or very positive growth in the upcoming years (Figure 7.4b).

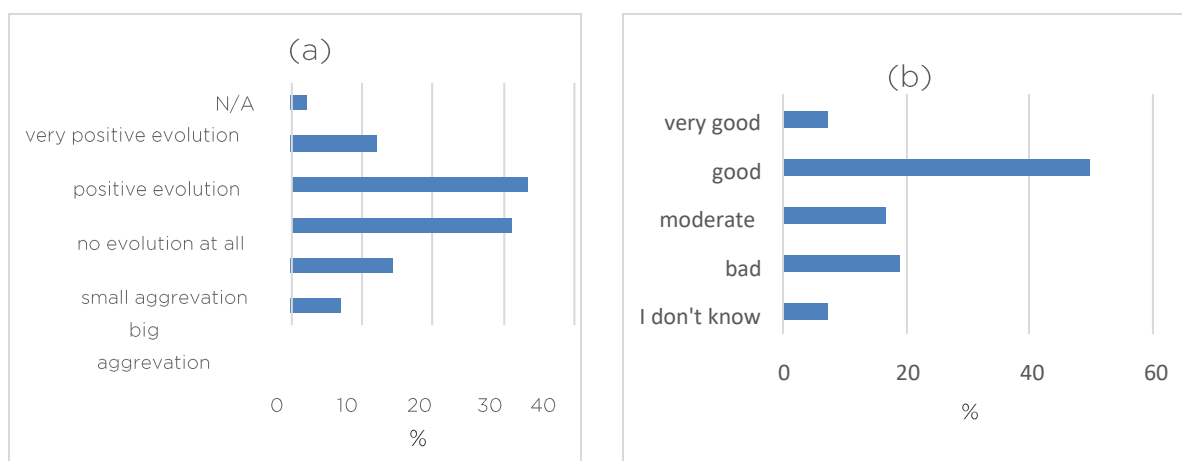


Figure 7.4. (a) Opinion of agricultural schools' graduates on the current situation of the dairy sector and (b) estimation of agricultural schools' graduates of a possible growth in the dairy sector

Moreover, 71% consider that the information sources on the starting up of a dairy enterprise are inadequate, while 15% believe that they are satisfactory (Figure 7.5a). The failure of the authorities to provide organized and integrated information on the required procedures for the creation of a dairy enterprise in combination with the labyrinthine legal framework, make it difficult for a prospective dairy processors to take the decision to start up an enterprise from scratch. Concerning the sources they obtain information on the aforementioned issues from, the majority is being informed from the press and from governmental agencies (Figure 7.5b).

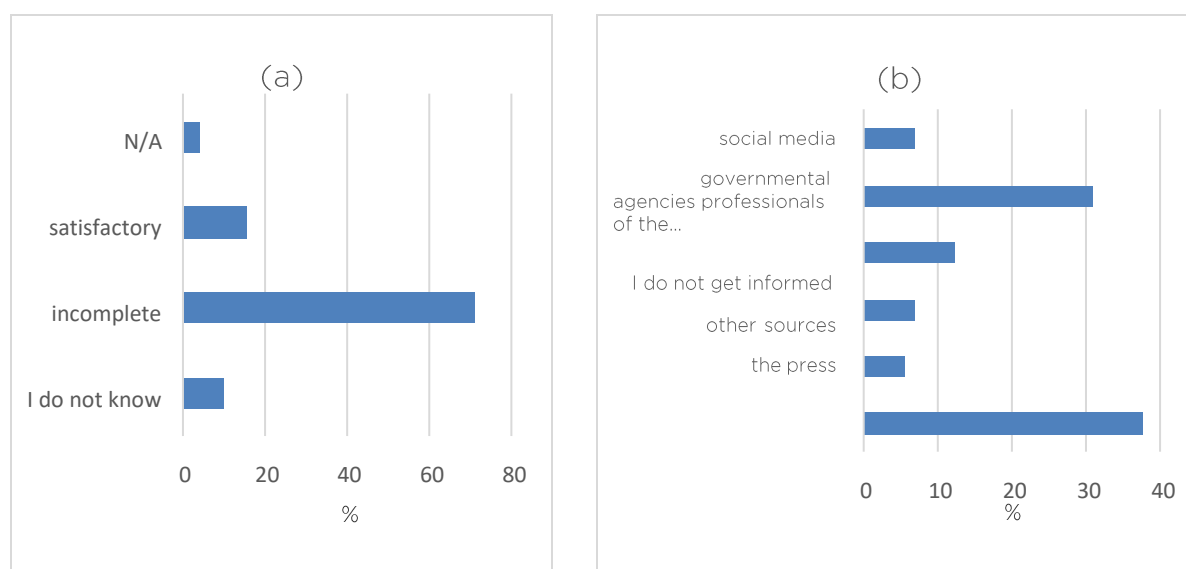


Figure 7.5. (a) Existing informative sources on the required procedures for the starting up of a dairy enterprise and (b) sources of information on issues concerning the starting up of a dairy enterprise

It is interesting to mention the results of a former study, where livestock breeders were questioned how much the starting up of a small dairy enterprise would cost; 64,5% of them estimate that the costs range between 50.000 to 350.000 euro (Psarrakis et al., 2015).

Concerning previous experience in attending training seminars, 64,4% have not attended any. Among the rest who have attended one or more seminars, 85% believe that it helped them in enriching their knowledge on issues concerning the dairy sector as a whole. Moreover, 37,2% consider that the ideal duration of a training seminar is one week, while 27,2% believe that it should last longer than a month (Figure 7.6). Finally, 46% believe that the most important limiting factors for the starting up of a dairy enterprise are financial, namely the personal deficit of money, the

inability to get the approval for a bank loan and the unstable financial situation of the Greek economy.

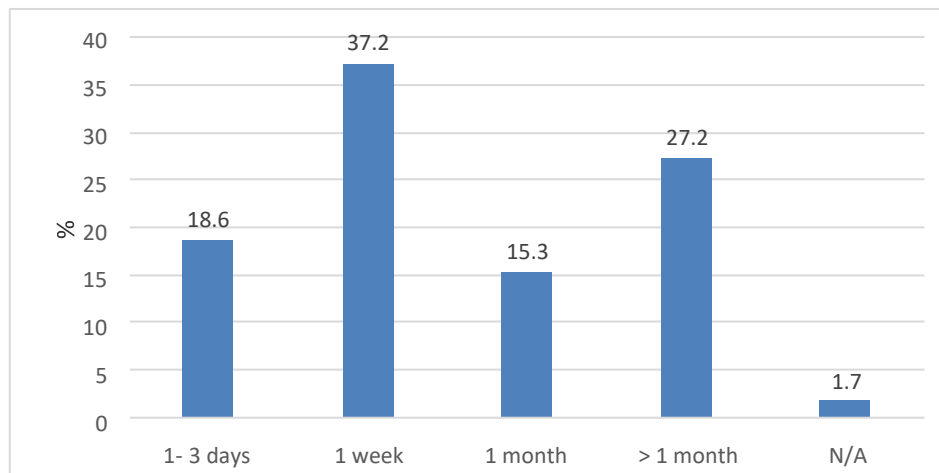


Figure 7.6. Opinion on the ideal duration of a training seminar

Chapter 8. Conclusions

1. Summary consideration of capacity and prospects in agriculture and food sector

The dairy sector in Greece is well developed. It comprises of 53 big dairy companies processing >5000 tons of milk per year and 671 SMEs or family dairy units processing <5000 tons of milk per year. They process all types of milk produced in Greece, namely 730.589 tons of cow milk, 735.669 of sheep milk, 350.871 tons of goat milk (production data in 2013) into a big variety of products, with the major ones being drinking milk, yogurt and cheese. In particular, the processing of sheep and goat milk, which can be considered as the competitive advantage of the Greek dairy sector, is mainly in the hands of SMEs and family dairy units. The dairy sector provides work to a total of 11.802 employees and makes 17,3% in production value of the food sector as a whole, which in turn makes in value almost 1% of the Greek economy (GDP) from a total of 3.3% of the whole rural sector's participation to the GDP.

With appropriate interventions, the Greek dairy sector has all prospects for a significant growth in the near future. These interventions include:

- Full use of the current vacant capacity of units by increasing production and availability of milk
- Modernization of the infrastructure of dairy units, especially of the SMEs and family units
- Full implementation of good practices and quality assurance procedures during milk processing
- Reinforce the marketing and distribution networks, and development of e-commerce
- Focusing on the production of dairy products of high added value, such as traditional and PDO products, e.g. cheeses, as well as specialty and innovative products, e.g. functional dairy products
- Strengthening the agrotourism
- Simplified procedures regarding licensing for installing a unit
- Implementing recent legislative regulations regarding dairy professional and inter-professional organizations

2. Accessibility and attractiveness (or discouragement) as youth employment opportunity, for youth new to farming and those with experience

The dairy sector in Greece is currently employing 11.802 employees. Interestingly, for a high number of graduates from dedicated University Department the access is rather limited. This is due to the excessive number of this type of graduates compared to the positions available in the big dairy companies and also the fact that big dairy companies try to maintain operational costs lows. At the same time, SMEs and family dairy units do not often employ dairy scientists basically for cost reasons as well.

However, the last 5 years and due to the economic crisis in Greece, there is an emerging tendency, especially among young people, to re-visit the agro-food sector in Greece and in particular dairy farming and dairy processing. In this sense, we consider that the current project is of significant importance for Greece.

3. Consumer habits and growth potential as well as export potential

The share of the expenditure for milk and dairy products within the food expenditure as a whole has remained almost stable between 2008 and 2014, fact that reflects the important position of dairy products in the dietary habits of the Greeks. Regarding milk, most consumers prefer pasteurized milk while high-temperature pasteurized milk comes second in quantity, claiming at the same time an increasing market share. The consumers' preference in yogurt mainly refers to

stained yogurt and in particular yogurt from cow milk. With regards to cheeses, the category of “soft cheeses”, which includes basically Feta cheese, ranks by far first in consumers’ preferences followed by “hard and semi-hard cheeses”, while at the same time imported hard and semi-hard cheeses are becoming also popular, mainly because of their lower prices. Still, the majority of the consumers choose PDO/PDI Greek cheeses, with goat milk cheeses being very appealing because of the so-called functional properties.

Feta cheese, as the worldwide well known flagship of Greek cheeses, and the Greek yogurt, which is dynamically emerging around the globe in recent years, can and should be used as precursors for the promotion of other Greek traditional and PDO dairy products and facilitate their access in the international markets. Although Greece is a small dairy “garden” in terms of quantities, it should exploit the high and particular quality of sheep and goat milk to produce specialty dairy products.

4. Regional considerations

Primary milk production in Greece is mainly concentrated in Central Macedonia and Eastern Macedonia and Thrace (cow milk), Thessaly and Western Greece (sheep milk) and Central Macedonia and Thessaly (goat milk). With respect to big dairy units, these are mainly concentrated in the regional units of Attica (Athens) and Thessaloniki. On the other hand, SMEs and family dairy units are spread all over the country, while traditional and PDO cheeses, mainly produced from sheep and goat milk are deriving both from the mainland, such as mountainous areas mainly the Pindos sierra (Grevena, Ioannina and Trikala) and the Mount Olympus (Larisa and Pieria), and the islands mainly Crete and Lesvos. Taking the above into account, we designed two Business Plans, namely (a) one for the further development of an existing dairy unit using as an example the region of Arcadia in Peloponnese, which ranks 1st in sheep and 2nd in goat milk production in Peloponnese, and (b) one for newcomers in the dairy sector using the Island of Lesvos as an example.

5. Stakeholder analysis

Key elements of the stakeholders’ grid are presented below. Joint traits for all stakeholders include: development of the dairy sector, reduction of prices in combination with products’ quality, emphasis on traditional products, extroversion and unemployment decline.

Stakeholder	Stakeholders interests	Assessment of impact	Potential strategies
Milk producers	<ul style="list-style-type: none"> - retaining of market share of Greek milk counter to imported - retaining of producers’ prices - reinforcement of subsidies to the sector - connection of Greek indigenous breeds with PDO products 	<ul style="list-style-type: none"> - retaining and increase of the employment in the primary milk producing sector (combating of unemployment) - positive impact on the milk processing sector - contribution to the agro food quality assurance - combating of food crisis - reinforcement of agriculture (raw materials) 	<ul style="list-style-type: none"> - reappraisal of the legal framework for the “protection” of Greek production (the example of 5days lasting milk) - information on the importance of the development of the primary sector - increase of PDO products (efforts at European level) - development of quality designations according to the European standards
Dairy units (small)	<ul style="list-style-type: none"> - stay in the marketplace - increase their market share 	<ul style="list-style-type: none"> - retaining of employees - support of family enterprises - reduction of unemployment - promotion of traditional products 	<ul style="list-style-type: none"> - increase of products’ variety - persistence on the production of traditional products
Dairy units (big)	<ul style="list-style-type: none"> - retaining of market share - extroversion 	<ul style="list-style-type: none"> - reduction of unemployment - increase of exports - promotion of traditional products 	<ul style="list-style-type: none"> - new/novel products - increase of exports (the example of “Greek yogurt”)

Trade	- retaining of the existing distribution network -further development of the distribution network	- price reduction	- development of logistics
Consumers	- low prices	- fighting against food crisis	- information concerning the association between price and qualitative value of the products (e.g. private and nonprivate label)
	- products' quality and safety	- improvement of living standards (social welfare)	-promotion and information
	- combating unemployment	- reduction of unemployment	- promotion of Greek products' advantages
State authorities (all)	-protection of PDO products	- increase of dairy production - improvement of trade balance	- funding and support of PDO certification programmes
	-reduction of unemployment	- increase of state revenues (Value Added Tax) - reinforcement of social security funds	- subsidy of employment programmes - reduction of enterprises' taxation
	-productive reconstruction	- improvement of trade balance - reinforcement of the processing sector	- reduction in the taxation of the primary sector of production - subsidy of sectors with comparative advantages (sheep

			and goat breeding)
	-fair competition rules	- price reduction - starting up of new enterprises	- stricter controls - improvement of legislation
	-protection of the environment	- diversified touristic development - harmonization with EU	- institutionalization of righteousness rules
Banking system / Investors	- healthy business financing	- stability of banking system	- more rational loaning criteria
	- repayment ability of loans		- reduction of interest rates - facilitating repayment (due to the financial crisis)

6. Synergies with other sectors and sectoral studies

It goes without saying that the dairy sector, i.e. milk processing, goes hand in hand with the primary milk production. On the other hand though, in a globalized economy environment, other sectors, such as product marketing and promotion as well as distribution practices and networks, are of fundamental importance. Last but not least, research & development, performed either in house or in collaboration with research groups in Universities and Research Center, is worldwide acknowledged as a vital development tool. The Greek dairy sector has to comprehend that all these synergies are needed for a sustainable growth at EU and international level.

Regarding other sectorial studies, several are being performed at regular time intervals in Greece. The most important ones have been used for data mining in the present study, namely those by ICAP, ELOGAK, ELSTAT and IOBE. Moreover, the EU funded project *"LACTIMED Promoting Mediterranean Dairy Products"*, which is currently running under the coordination of the French ANIMA Investment Network with 3 Greek partners involved, namely the University of Thessaly, the Union of Hellenic Chambers of Commerce and Industry and the Hellenic Ministry of Rural Development and Food, is expected to deliver valuable information about the dairy sector in Greece.

7. Implications for agrotourism

Agrotourism with regards to the dairy sector has not developed sufficiently despite the considerable efforts made so far from both by the tourism entrepreneurs and the relevant public authorities. However, agrotourism is considered a sector with a high growth potential and can be an alternative approach in the development of entrepreneurship in rural areas combined with sustainable development. The more systematic and better organized supply of local and traditional dairy products to touristic units, such as hotels, restaurants and retail stores, is needed. Both existing dairy units as well newcomers have to take the option of agrotourism more seriously and adapt their business accordingly.

8. Implications for e-commerce

In Greece, e-commerce, as a whole, is emerging in recent years as a growing trend mainly among consumers and in lesser degree among Greek entrepreneurs. This is also valid for the food sector. As in the case of agrotourism, dairy units, no matter big or small, should seriously consider e-commerce as a tool for better promoting their products and developing their business.

- 9. Analysis of imports and opportunities for Greek-produced substitutes** Relatively large amounts of cow milk are imported in Greece, mainly either as high-temperature pasteurized milk or condensed milk. Regarding cheese, imports of semi-hard and hard cheeses are steadily increasing in recent years. It is true that, in contrast to sheep and goat milk, Greece is deficient in cow milk production, and this is mainly used either as drinking milk or yogurt. In this sense, production of cow milk should increase so as to allow cow milk processing to products that are currently imported. However, it should be seriously discussed and debated whether investments towards this option should be a priority at national economic and social level compared to investments in the field of sheep and goat milk and the traditional products thereof.

10. Prerequisites to entrepreneurial success (critical success factors)

- Stable legislation and economic environment

- Faster and efficient state administrative procedures
- Implementation of quality and safety assurance systems in milk processing
- Constant up-dating in processing techniques following the progress of dairy science and technology
- Connection of the PDO and traditional products with their origin in terms of qualitative characteristics as the basic pillar of marketing strategy
- Participation of dairy SMEs in dairy intra- and inter-Professional Organizations for coordination in matters of product marketing and promotion "
- Continuous up-dating on new trends on consumers' preferences
- Participation in national and international food exhibitions, so as to both acquaint foreign markets their products and explore possible export potentials
- Promotion of products at a local level with a view to connect with the agrotourism sector

11. Recommendations for consideration in the implementation phase

According to our opinion there is practically one major recommendation regarding the implementation phase, which regards the establishment, in collaboration with the Agricultural University of Athens, of infrastructures and curricula for educating newcomers in the dairy sector. This effort will be only successful if it is not again a sporadic one but part of an integrated and well-coordinated effort at national level. That means, operational synergies with similar initiatives as well as continuous follow-up, supervision and constant evaluation are needed.

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ANNEX I

Business Plan I for a Medium Scale Dairy Unit *«Further Development of an Existing Medium Scale Dairy Unit»*

EXECUTIVE SUMMARY *(Detailed data are presented in the respective PPT file)*

1. Introduction

The present Business Plan (BP) is part of the study entitled *«The Dairy Sector in Greece: Constraints and Opportunities for Existing Producers and Newcomers»* performed by the Laboratory of Dairy Research at the Agricultural University of Athens. The BP focuses on **guidelines** for existing small dairy units for further development either independently or by creating local cooperatives. We have chosen as location example the Prefecture of **Arcadia** in **Peloponnese**, so as to be applied with few modifications in similar areas in Greece. The BP includes the steps and procedures needed in order to operate a viable and profitable dairy company. In order to evaluate the size and the conditions of setting up the company, we used existing data as these are described in our main study and also data deriving from the questionnaires conducted in our study addressing both existing dairy units and consumers. The company is able to exploit 1.560 tons of milk annually, with a total production of 448,8 tons of dairy products, in facilities of 250 m² located in a 2000 m² site and with 15 employees. The funds required for the establishment of the company amount 531.100 euro and will be covered from own funds and short-term loans.

2. Aim of BP & Company's general purpose

In our main study, it was shown that the potential of sheep and goat milk in Greece is high and thus it is anticipated that the further processing of sheep and goat milk into both traditional and new or innovative products can result in major benefits for the Greek economy. This is evidenced mainly by the export potential of the PDO Feta cheese and also yogurt, and in lesser degree of the rest Greek PDO cheeses. One major goal of the company is to focus on cheese prepared from goat milk. It should be stressed that Greece is the first country in the world in the per capita production of goat milk, however, no distinct or specialty goat milk cheese of high added value is produced. In particular, in Arcadia the quantity of the annually incoming goat milk amounted 5.387 tons in 2014, with 131.487 tons being the total quantity at national level. Moreover, the exploitation of the goat milk produced in the above area, the qualitative diversification of products with emphasis on the Mediterranean and healthy lifestyle, enhancement of consumers' perception regarding goat milk products, as well as environmental considerations regarding production, are additional key goals.

3. Description of company

The company will produce annually 448,8 tons of dairy products by processing 1.560 tons of milk. The distinctive name of the company is «Dairy Arcadia SA» and the legal form of S.A., i.e. joint-stock company. According to the Greek STAKOD (Statistical Classification of Economic Activities), the industry activity code is 155.1 Dairy. The dairy unit is located in a 2.000 m² site in the Municipality of Mantinia, Prefecture of Arcadia, and thus in the center of Peloponnese. The personnel to be hired is presented in Table 1.

Table 1. Personnel

Working Position	Staff	Qualifications	Experience (years)
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General manager	1	Economic Studies	> 8
Product manager	1	Food Technologist	> 5
Marketing	1	Marketing Studies	> 5
Accountant	1	Accounting studies	> 2
Cheese-makers	4	Technological education	> 3
Drivers	3	Licensed for cars > 3.5 tons	> 3
Sales, commercial manager	3	University or Technological education	> 4
Cleaning staff	1		No experience needed
Total	15		

4. Location, Infrastructure and Products

We have considered the following factors as the most important regarding the geographical location of the company (a) the total milk production in the specific region, focusing on sheep and goat milk, (b) the milk availability in the nearby areas, (c) the number of other dairy units operating in the area and (d) the production capacity of the particular region's dairy units, opposed to the corresponding of the rest regions. The region of Arcadia meets all the above criteria, as it is situated in the center of Peloponnese and also produces the biggest quantity of sheep milk compared to the rest regions of Peloponnese, which together with goat milk will be the main raw material for the unit. Moreover, its location facilitates milk collection and product delivery at reduced transportation costs. Arcadia is also between two main urban centers, i.e. Athens and Patras, which are important and big markets for the food sector. Finally, it is close to the region of Messinia, which is a well-known touristic destination.

In order for the company to be competitive in the dairy market, the incoming milk should be fully utilized by the unit. This will be achieved by careful selection of the products, supply of the raw material from farmers under contract, financial incentives to the farmers for the procurement of raw material throughout the year, e.g. by applying alternately estrus to the herd, and, finally, better production time management throughout the year.

The products of the unit are shown on Table 2. PDO Feta will represent the largest share of the produced cheese volume, approximately 66% of the total cheese production and 33.94% of the total production. Chevre type soft goat cheese is anticipated to reach high prices. This, combined with the lower production costs, as goat milk is almost 40% cheaper than sheep milk, is expected to enhance the profits of the company. Graviera cheese and also yogurt, both made from cow milk, have been chosen for extending the operation time of the unit throughout the year, since sheep and goat milk are seasonable. All products will be available in suitable packaging in retail stores, tourism sector stores, caterers and delicatessen stores.

Table 2. Product description

Product	Cow milk	Sheep milk	Goat milk	Description (FDC)*	PDO	% of products
PDO Feta		Yes	Yes	Art.83	Yes	33,94
Graviera		Yes		Art.83	No	8,43
Graviera	Yes			Art.83	No	4,08
Chevre type Soft			Yes	Art.83	No	3,79

Chevre type Ripened		Yes	Art.83	No	1,26
Yogurt	Yes		Art.82	No	16,86
Yogurt	Yes		Art.82	No	16,86
Deserts Pudding	Yes		Art.84	No	14,76

* FDC: Food and Drinks Code

The production steps per product type are described in Figure 1. Total quality control system will be implemented throughout the production chain. The company has the appropriate technological equipment that allows diversification when needed. The range of products enables operation 12 months a year, total of 312 days, since when no goat and sheep milk are available, the production focuses on products from cow milk, thus expanding business profitability.

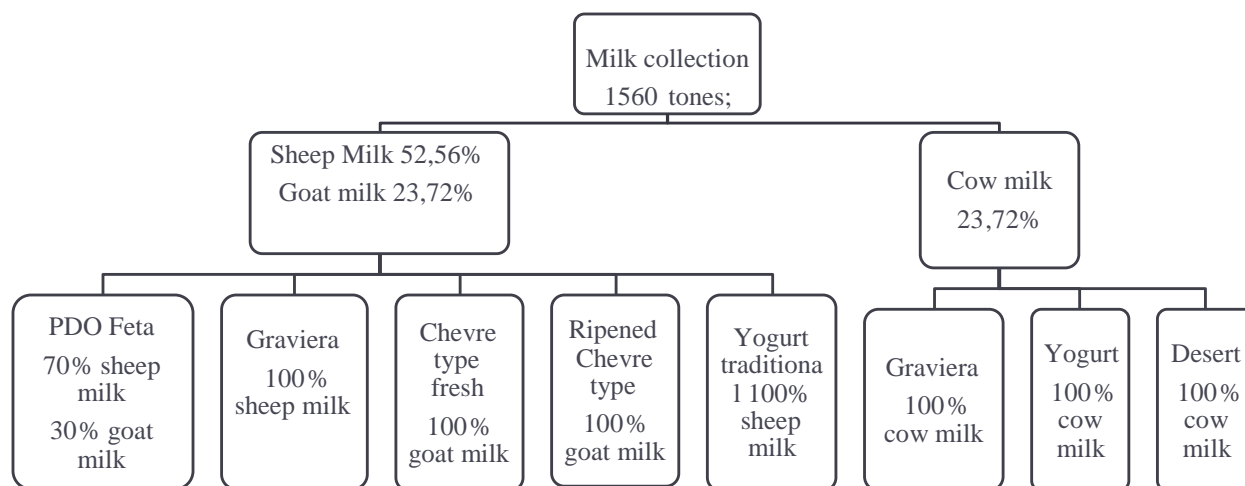


Figure 1. General Operational Plan of the Dairy Unit

5. Marketing Plan

SWOT analysis

Table 3. SWOT Analysis

Internal Environment (company)	
Strengths (S)	Weaknesses (W)
<ul style="list-style-type: none"> • Flexible production process • Careful selection of the product mix • Longer lifespan for cheese products as well as fewer (and less) returns • Organoleptic characteristics • Under contracts supply of milk 	<ul style="list-style-type: none"> • Seasonality of milk production " High costs of initial installation • Returns management costs
External Environment (market)	
Opportunities (O)	Threats (T)
<ul style="list-style-type: none"> • State funding for SMEs subsidize extensions projects • Growing confidence in Greek traditional products • Growing trend Mediterranean diet and health food • The PDO indication offers added value products (Goodwill) 	<ul style="list-style-type: none"> • Great bargaining power of buyers • Low purchasing power of consumers due to the economic situation of the country • Significant competition in dairy products • Difficulties in obtaining funds from banks

PORTER Analysis

Threat of New Entry: Entering a new business in the dairy industry is not considered to face difficulties with the condition that it is able to obtain the requisite quantity of milk. The required capital to the supply of the raw material is considered a critical factor for the investment.

Threat of Substitutes: Milk and dairy products are not threatened by other substitutes because they are an integral part of the daily diet. Special foods, such as low-lactose dairy products, are not of concern for the general public due to the low frequency of lactose intolerance (Bulhões, 2007).

Bargain Power of Suppliers: The bargaining power of domestic farmers is particularly small with regards to the milk price. The goat milk bargaining power of suppliers is usually less than for sheep milk because goat milk is processed into goat products, but to a lesser extent is mixed with sheep milk to give added value products, such as PDO Feta. Fresh cow milk, after the recent EU quota system abolition, is expected to bring significant price fall and further weaken the negotiation power of cow farmers. Sheep milk price in 2014, formed in the weighted average, was 0,90 euro/kg, which is 40% higher than this of goat milk.

Bargain Power of Buyers: The supermarket chains procure large quantities and contribute, also, to the recognition of a product, thus constituting very important markets for every business. Bargaining power of supermarkets is very high as it is primarily determined by the ability they have to distribute almost the highest percentage of food handling from their chains.

Rivalry Among Existing Competitors: The dairy market as a whole is a highly competitive market. The larger companies' bargaining power is considered high especially regarding distribution channels and collection of the raw material. On the contrary, for the SMEs, which

operate with small portions, i.e. 1% -2% of the total cheese production, and are spread throughout the country have lower bargaining power.

Strategy

The company will be active in a growing market and try to gain benefit advantage over competitors through high quality and innovative products as well as locality. The levels of strategy include:

1. Corporate level: wide penetration target, with market share growth through attracting of customers
2. Business Units Strategy: by achieving competitive advantage through product differentiation
3. Operation detailed strategy through the marketing and sales
 - Growth strategy for PDO Feta, Graviera, Yogurt, Desserts
 - Diversification strategy for fresh and ripened Chevre type goat cheese
 - Differentiation (Level Operations) internet marketing, Search Engine Optimization (SEO) and e-Commerce

Marketing mix

The operation detailed strategy will be implemented by the 4P marketing tools, i.e. Product, Place, Price and Promotion.

Product: Emphasis will be given to creating quality products through knowhow in dairy technology by recruiting a skilled and qualified food scientist for the position of the Production Manager as well as experienced cheese makers.

Brand name: The brand name «Dairy Arcadia SA» differentiates the company's products from competition and strengthens locality.

Packaging: Packaging should offer protection towards damage, recognition and differentiation, being at the same time user friendly and appealing to consumers. The products' packaging will be as follows: (a) PDO Feta in metal containers of 8 Kg and plastic tupperware of 400g, (b) Graviera in plastic vacuum pouch of 10Kg, (c) Fresh goat cheese in plastic vacuum pouch of 250g and (d) yogurt and deserts in plastic cups of 240g.

Place: The distribution of the products will be mainly B2B but there will be also the possibility for consumers to buy directly from a dedicated shopping area in the factory's site (B2C) or through the company's website.

Price: The selection of the company's products billing method will be a different pricing strategy depending on the type and the competition, i.e. (1) low price strategy for Graviera from cow milk and yogurt from cow milk, (2) competitive price strategy for PDO Feta, Graviera from sheep milk, yogurt from sheep milk and deserts from cow milk, (3) high price strategy for Chevre type soft from goat milk and Chevre ripened from goat milk. The selling prices of products in wholesale are presented in Table 4.

Promotion: Advertising on TV and radio stations in the Peloponnese region along with internet advertising are the main channels for promotion. TV and radio are still important sources of information and they address a mass audience, especially in the countryside. The promotion via internet will be implemented in three ways, namely content marketing, paid marketing and social media marketing.

Table 4. Selling prices in wholesale

<u>Product</u>	<u>Price (euro / Kg)</u>	<u>Product</u>	<u>Price (euro / Kg)</u>
PDO Feta	5,5	Chevre type ripened	12,0
Graviera (sheep milk)	8,0	Yogurt traditional (sheep milk)	3,0
Graviera (cow milk)	7,0	Yogurt (cow milk)	2,0

6. Start-up procedure and Project Timeline

The establishment of a dairy unit may last several months due to complex legal requirements. The whole procedure can be done exclusively at local Citizens Service Centers (KEP) and should include submission of a complete file containing the following:

- Establishment application /operation licensing
- Topographical chart of the plot (in scale 1:500)
- Ground plan of the installations including with detailed description of the spaces
- Enumeration table and description of the technical equipment, devices and instruments with an outline of their location in the space
- Technical description report of the unit's function
- Flow chart for the production of each product, the daily capacity, the raw materials, the final products as well as a report of PDO products (if produced)
- Preliminary approval for the establishment and approval for environmental provisions
- Waste management report

For the start-up of the enterprise, 12 months are required and it will totally take 18 months until its full operation, as it can be seen in Table 5.

Table 5. Business Plan Implementation Timetable

	M1 *	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15
Establishment of the Legal Scheme															
Rooms & infrastructure development															
Equipment establishment															
H/R recruitment															
Collaboration with suppliers															
Selling products network organization															
Website creation															
Certification "Hellenic" Enterprise															
ISO 22000 certification															

* M: month

7. Financial analysis and Business Assessment

Business start-up costs

Due to the current conditions in Greece, the company was designed so as not to use bank loans regarding to the initial installation. The start-up's costs of 531.100 euro will be fully covered by share capital. This amount is invested one year before the company's operation. The capital required for the annual running of the business amounts 1.200.000 euro, which mainly goes for the milk supply. For the first two years, this capital will be supplemented with a sort term bank loan, less than 100.000 euro per year and with an interest rate of 8.25%, which, under the current conditions, it is possible to be disbursed (basic scenario).

In an alternative scenario, with the unit's establishment relying either on a private investor or on producers' collective effort, the state subsidy option should be considered. The funding, under the national rural development program, can reach 65% of the installation costs. A realistic final funding is estimated at 37.28%, i.e. 198.000 euro. Significant improvement in the cash flow observed from the first year is a positive sign which enables the company to virtually eliminate its bank loans.

Evaluation of the investment

After the 1st year, the smooth establishment of the company's baseline scenario consistently yields large profits and at the end of the 2nd year the company distributes dividends of 20% to the shareholders (Figure 2).

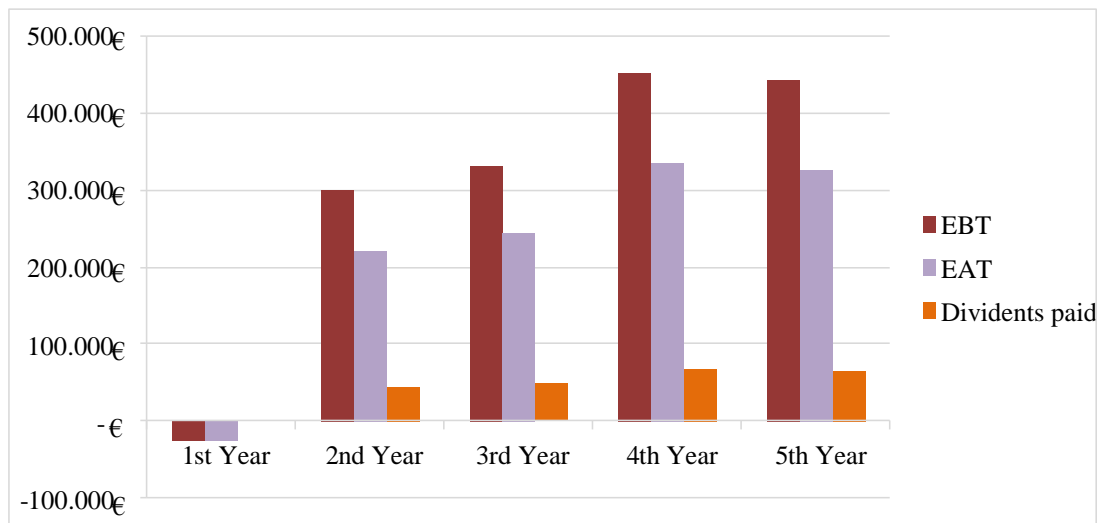


Figure 2. Earnings After Taxes (EAT), Earnings Before Taxes (EBT), Dividends paid annually (basic scenario)

Sales are calculated with a growth rate of 8% and 6% for the 2nd and 3rd year, respectively (Figure 3), while the percentage of returned products considered as Fast Moving Consumer Products (FMCG; e.g. yogurt, desserts) is 9%.

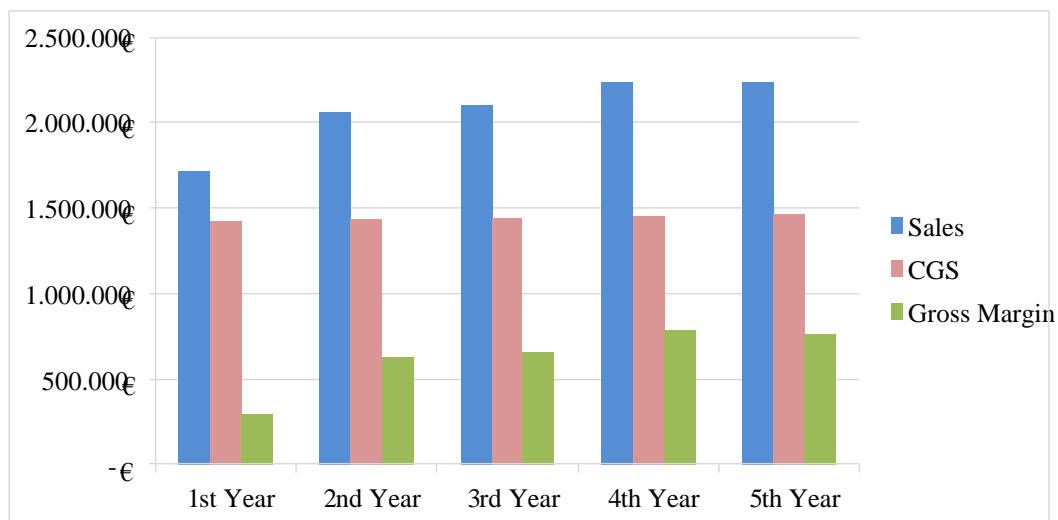


Figure 3. Sales, Cost of Goods Sold and Gross Margin (basic scenario)

Data on profitability Return on Total Assets (ROTA) and Earnings After Taxes (EAT) are shown in Figure 4. We observe that the return of capital is consistently high throughout the five years yielding high profits to shareholders.

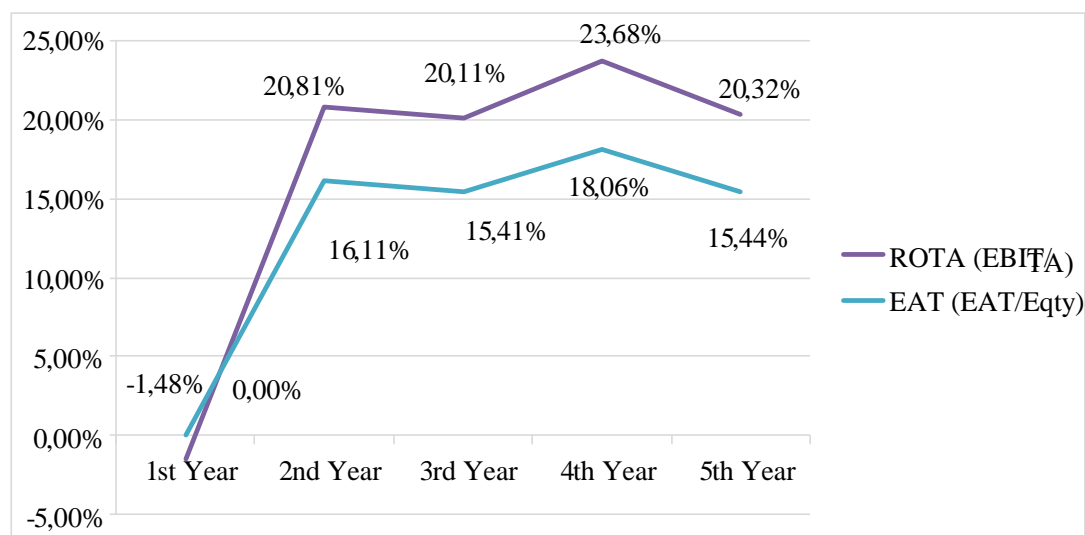


Figure 4. Return on Total Assets (ROTA), Earnings After Taxes (EAT) (basic scenario)

The net present value at decade level is 1.500.598 euro with a 8.25% discount rate and the repayment period is less than 6 years, namely 5,18 years (Table 6), while the detailed Balance Sheet is depicted in Table 7.

Table 6. Indicators of investment evaluation (basic scenario)

Indicators of investment evaluation	
NPV*	511.100 €
NPV 10 years	445.320 €
NPV 20 years	1.500.598 €
IRR** 5	-7,30%
IRR 10	14,71%
IRR 20	20,01%
Payback period (years)	5,18

*NVP: Net Present Value; **IRR: Internal Rate of Return

Table 7. Five year Balance Sheet (in euro) (basic scenario)

	Year 0	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
Assets	531.100 €	1.317.649 €	1.455.751 €	1.640.496 €	1.908.503 €	2.169.941 €

Net Fixed Assets (FA)	511.100 €					385.400 €
		485.960 €	460.820 €	435.680 €	410.540 €	
Inventories (INV)		193.688 €	195.291 €	196.759 €	198.255 €	199.766 €
Receivables (AR)		638.001 €	799.640 €	817.024 €	869.174 €	869.174 €
Cash	20.000 €	0 €	0 €	191.033 €	430.533 €	715.600 €
Liabilities and Equity	531.100 €	1.317.649 €	1.455.751 €	1.640.496 €	1.908.503 €	2.169.941 €
Capital (Cap)	531.100 €	1.210.000 €	1.210.000 €	1.210.000 €	1.210.000 €	1.210.000 €
Inventories (INV)		0 €	178.988 €	374.279 €	641.858 €	902.865 €
Loans (L)		52.310 €	10.966 €	0 €	0 €	0 €
Payables (AP)		55.339 €	55.797 €	56.217 €	56.644 €	57.076 €
WORKING CAPITAL	20.000 €	724.040 €	928.168 €	1.148.599 €	1.441.318 €	1.727.465 €

8. Conclusions

This BP aims to be a profitability model for the above dairy unit in the dairy sector. The unit's design effort was based on the utilization of sheep and goat milk so as to manufacture high quality products. The large untapped potential of the Greek dairy production in the countryside should be highlighted and used in order to restart the Greek economy as well as to create new jobs. Due to the financial crisis that Greece is going through and as the company does not use bank loans, it might, at first, seem difficult to gather the necessary funds. However, this could be achieved through collective efforts of the local communities and the producers. The economic performance of the operation is due to the manufacturing of well-known products, such as PDO Feta and Graviera, fast moving products, i.e yogurt, as well as new products, e.g. Chevre type goat cheese. The company in order to sustain the profitability should try to develop products that have high earnings by using cheaper raw materials, such as goat milk, and replacing, in time, some products having smaller profit margins. The company operating this way will manage to achieve the objectives initially set.

ANNEX II

Business Plan II for a Small Scale Dairy Enterprise

«Guidelines to Newcomers for Setting- up a New Business in the Dairy Sector»

EXECUTIVE SUMMARY

(Detailed data are presented in the respective PPT file)

1. Introduction

The present Business Plan (BP) is a part of the study entitled *«The Dairy Sector in Greece: Constraints and Opportunities for Existing Producers and Newcomers»* performed by the Laboratory of Dairy Research at the Agricultural University of Athens. The BP focuses on **guidelines** to newcomers for setting-up new businesses in the dairy sector, using as an example

the Island of **Limnos** in the North Aegean Sea, so as to be applied in similar areas in Greece properly revised if needed. All procedures, which are essential for the installation and operation of a small dairy unit in Limnos, capable to **exploit 500 l of milk per day**, are described step by step. The unit has 5 employees, facilities of 200 m² and is installed in a 400 m² site. The investment costs amount 164.000 euro and the cash flows 115.290 euro/year. For the needs of the BP, data and information from the above mentioned study as well as the results from 3 questionnaires conducted forwards the aim of this study have been used.

2. Aim of BP & Company's general purpose

One of the main goals of the dairy unit is to exploit the local raw milk in order to reveal and promote the value of the local traditional products. By using the sheep and cow milk produced in this area, the company will help enhancing the Greek primary sector at local level. A further significant goal is to produce high quality biological and traditional products, so as to promote the Mediterranean diet and the healthy way of life. Finally, the protection of the environment is also a priority by installing waste management procedures.

Towards the aim of the current BP, three main goals are anticipated to be achieved, namely:

- To encourage newcomers' willingness in starting-up business in the dairy sector
- To enhance the promotion of Greek traditional products
- To boost the efforts against unemployment of youngsters in Greece

3. Description of company

A **small and flexible structure** is suggested, in order to fulfill all company's needs. Information regarding size, educational level and expertise of the **personnel** is shown in Table 1. Due to its small size, the company cannot afford an accountant or a legal adviser as permanent personnel, and thus these services will be outsourced, under the supervision of the Director General. The enterprise's legal form is general partnership (OE) and falls into sector 155.1 according to the Greek Statistical Classification of Economic Activities (STAKOD).

Table 2. Personnel requirements

Working Position	Staff	Qualifications	Experience (years)
Product manager	1	Food Technologist	> 5
Cheese-makers	2	Technological education	> 3
Drivers	1	Licensed for >3.5 ton	< 3
Cleaning staff	1	-	-
Total	5		

4. Products and infrastructure

The unit will use both cow and sheep milk produced in the Island of Limnos. It should be noticed that the milk produced in Limnos can cover all needs. In particular, the company will need, daily, 500 liters of milk, quantity that can be supplied by 2 cattle breeders (10 cows each) and 2 sheep breeders (100 sheep each). The products of the company are shown in Table 2.

Table 2. Description of products

Product	Cow milk	Sheep milk	Description (FDC) *	PDO **
Sheep yogurt		YES	Art. 82	NO
Cow yogurt	YES		Art. 82	NO
Kefalotyri		YES	Art. 82	NO
Myzithra-Anthoriro		YES	Art. 82	NO
Cream	YES		Art. 82	NO
Rice pudding	YES		Art. 82	NO

* FDC: Food and Drink Code; ** PDO: Product with Designation of Origin

The company has 3 production lines: (a) yoghurt, (b) cheese and (c) cream and rice pudding. The required equipment costs amount 85.000 euro. The covered facility's area totals 200 m² and includes the manufacturing zone, cold rooms, ripening rooms and other minor spaces. The construction is of industrial type and the required means of transport (3 vehicles) are proprietary. The key of the company's success is that all products are distributed as packaged products. This way, the company increases the variety of products, so as to meet the customers' demands. Depending on the demand, the company can slightly modify each product, e.g. different kind and weight of package, different tastes in creams etc. The modification can be achieved with the existing equipment without any significant increase in the production costs. The ISO 22000 is deemed to be very important for the company not only for product safety and hygiene but also because it makes the products more attractive, as this was emerged from the consumers' questionnaires we have collected.

The selection of the specific products was based on the following criteria:

- Cream and rice pudding o They have big profit margin, as it can be seen in the Annex (PPT file).

- They require low cost equipment (1.400 euro) and with some minor adjustments several similar products, e.g. cream with different flavors, light products, cream with jelly etc., can be also manufactured
- They are considered traditional products and part of the Greek diet
- Kefalotyri
 - The production of a hard cheese, such as Kefalotyri, allows the enterprise to increase its products' variety, by including Myzithra and Anthotyro, which are produced from the whey obtained during Kefalotyri production, decreasing at the same time the production costs of Kefalotyri by 25%
 - With the same equipment, a wide variety of hard and soft cheeses can be produced, both PDO and non-PDO, depending on demand
- Yogurt
 - It is a traditional product highly popular not only in Greece but also abroad
 - It requires low cost equipment (4.500 euro)

The option for a bigger variety of products, namely 9 codes, is based on the fact that the unit is located on an island hosting a big number of tourists and other visitors every year and can thus exploit the opportunity to deliver products to local touristic units, e.g. hotels, restaurants, retailers, etc. This way, the unit establishes tight links with the area's touristic activity and more specifically with the emerging and economically promising sector of agrotourism. If needed, the unit has the ability to produce differentiated products depending on the demand.

5. Marketing strategy & SWOT Analysis

The Marketing Mix is the policy and the strategy that the dairy unit must follow, so as to achieve its general and specific goals. The marketing mix includes **4P (Product-Price-Place-Promotion)**. The small dairy unit chooses to produce products that are not appealing to the big-scale companies (Table 3). It focuses on products differentiation, so as to offer products that attract different targeting groups, i.e. to B2B (Business to Business) and B2C (Business to Consumer). The company is targeting the Niche Market, so as to satisfy specific needs of consumers, e.g. traditional yogurt. These market segments are not suitable for mass consumption and for this reason they are not preferred by the big companies. *Via* this strategy the company avoids the intense competition with the big and powerful companies and covers needs of a market, which is "forgotten" by other producers. In order to achieve a **successful entrance** in the market, the company must proceed to **market's segmentation**, targeting and positioning. Market **segmentation** is a **key marketing tool**, which separates the potential customers in different categories. The following segmentation is done by taking into consideration mainly the psychographic criteria of the consumers and not necessarily other, such as financial criteria. The SWOT analysis is presented in Table 4.

Advertising of the company and the products will be performed *via* a website, including an electronic selling platform. Interestingly, according to the questionnaire of the present study that was addressing existing dairy units in Greece, it was shown that 73,9% of them have a website, none an electronic selling platform though.

Table 3. Product Targeting

Products		B2C					B2 B	
Lines (5)	Codes (10)	Elderly	Tourists	Children	Preference on Greek products	Preference on local	Pastry shops and bakeries	Hotels – restaurants
Traditional sheep milk yogurt	200 g (plastic pot)	+	+		+	+	+	+
	900 g (clay pot)	+			+	+	+	
Cow milk yogurt	200 g (plastic container)	+	+		+	+	+	+

Cheeses	Kefalotyri (5kg)	+	+	+	+	+		+
	Anthotyro (1 kg)	+	+		+	+	+	+
	Myzithra (1 kg)	+	+		+	+		+
Cream	Plain (200 g) (plastic pot)	+	+	+	+	+	+	+
	Flavored (200 g) (plastic pot)	+	+	+	+	+	+	+
Rice pudding	Rice pudding (200 g) (plastic pot)	+	+					
	Flavored (200 g)	+	+		+	+	+	+

Table 4. SWOT Analysis

Internal Environment (company)	
Strengths (S)	Weakness (W)
" Production flexibility o Possible to produce different products o Possible to produce differentiated products Low investment capital Small waste quantities " Farmers with low negotiation power " "	<ul style="list-style-type: none"> Non innovative products Seasonality of sheep milk Products with limited shelf life
External Environment (market)	
Opportunities (O)	Threats (T)
" Positive image of traditional products in recent years " Lack of competitors regarding very similar products " Products are part of Mediterranean diet "	" Strong negotiation power of buyers " Similar traditional products are offered, also, by major firms " Indirect competition by relevant products " Consumers' purchasing power is reduced constantly

6. Start-up Procedure and Project Timeline

The business start-up procedure of a milk processing unit in Greece is quite time consuming due to complex legal requirements and procedures. However, in recent year, the whole procedure can be exclusively done at local Citizens Service Centers (KEP). The procedure begins with the preparation and submission of a folder that will be examined and testified by the relevant authorities. This should include:

- Application for establishment and operation licensing, which is issued by the respective authority or KEP
- Topographical chart of the plot in scale 1:500

- Ground plan of the installation with detailed description of all spaces
- Enumeration table and description of the technical equipment and instruments with an outline of their location
- Report of the technical description of the unit's function
 - o Production flow chart for each single product
 - o Daily capacity
 - o Raw material
 - o Final product
 - o Report of PDO products, if produced
- Pre-approval of the unit's siting and environmental terms approval (Ministry of Environment, Physical Planning and Public Works)
- Report on waste management

For the start-up of the enterprise 12 months are required and it will totally take 18 months to achieve full operation (Figure 1).

7. Financial analysis and Business Assessment

Business start-up costs

For the establishment of the unit a 164.000 euro loan will be required. The pay-out will be completed in the following 20 years with 6% interest rate. The interest amortization dose is stable, namely 14.312 euro annually. The charge with the interest for 20 years is 122.240 euro and the borrower will pay 286.240 euro totally. The possible financing means are through equity capitals, through bank loan, which is particularly difficult under the current economic crisis in Greece and requires collateral mortgage or savings, through individual investors, e.g. Business angels or through Greek or EU funding programmes, e.g. the ESPA Programme.

According to the outcome of the newcomers' oriented questionnaire performed in the context of our study, the majority of the prospective newcomers in the dairy sector expressed their interest in starting up a business with the support by this type of programmes.

Cash flows (in euro)

- Income: 310.594
- Expenses: 195.304
- Cash flows: 115.290

From our questionnaire addressing existing dairy units, it was noticed that the small dairy units have relatively low negotiation power against medium- or big-scale ones. In particular, the majority of them pay immediately or within 3 months their suppliers, while they are paid by their clients within 3-6 months. From the latter, it was presumed that, apart from the initial investment, the entrepreneur will require to have in the company's circulatory capital an analog of at least 6 months, approximately 100.000 euro, in case the unit does not have easy access to bank loan.

Evaluation of the investment

1st (basic) hypothesis (100% sales from the very first year)

If the repayment of the initial invested capital is accomplished during the 3rd year of operation, the enterprise is evaluated positively and thus from the 3rd year are given dividends (Figure 2).

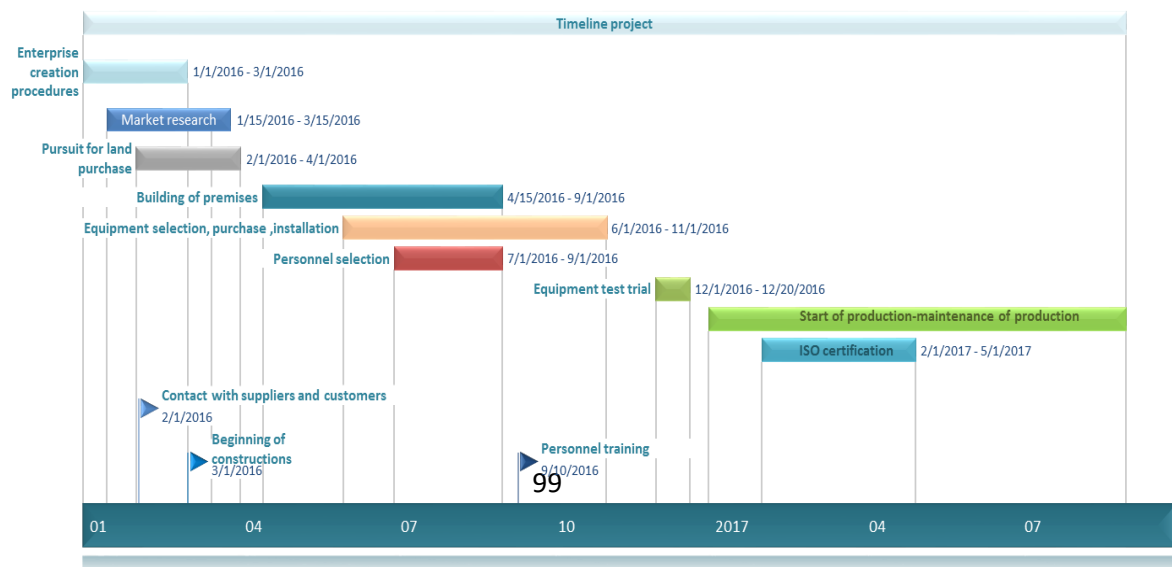


Figure 1. Startup Timeline

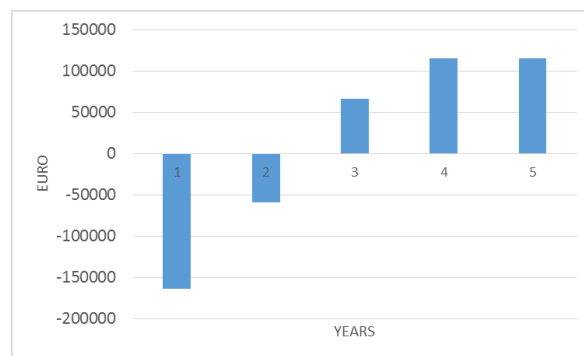


Figure 2. Investment capital repayment time

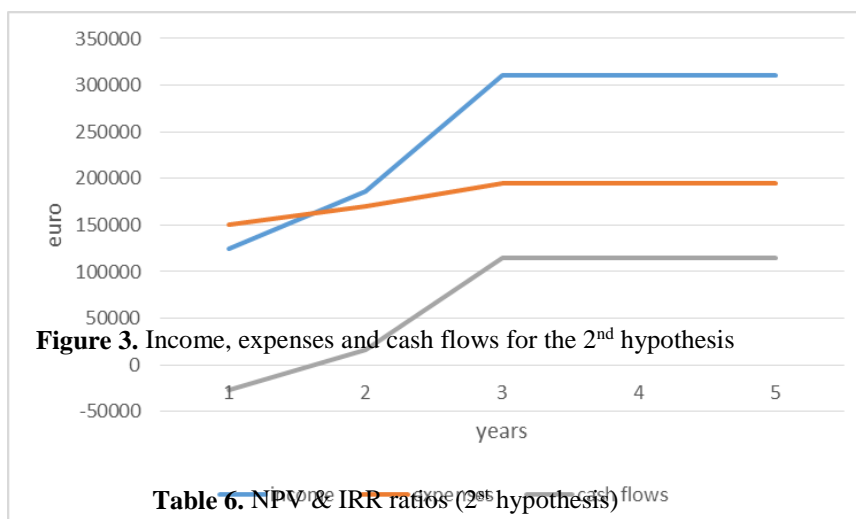
Table 5. NPV & IRR ratios (1st basic hypothesis)

	5 years	8 years	15 years
NPV*	131778	492290	807935
IRR**	49	69.25	70.2

* NPV: Net Present Value; ** IRR: Internal Rate of Return (%)

2nd (alternative) hypothesis (reduced sales for the first years)

In the case that the sales are 40% for the 1st year, 60% for the 2nd and 100% for the 3rd, the enterprise will be depreciating the invested capital during the initial 4 years and the NPV and IRR indicators are positively evaluated.



3rd (alternative) hypothesis (subsidy 40% of the investment)

In the case of a 40% subsidy of the investment, the required private capitals are reduced 98.400 euro. If the sales range within the amounts of the 2nd alternative hypothesis, the investment is positively evaluated according to NPV and IRR indicators (Table 7).

Table 7. NPV & IRR ratios (3rd hypothesis)

	5 years	8 years	15 years
NPV*	94121	454600	770200
IRR**	48	74.3	76

* NPV:
Net Present Value; ** IRR: Internal Rate of Return (%)

8. Conclusions

The present BP includes guidelines for starting-up a small milk processing unit. The BP additionally emphasizes at the points of the whole procedure where special attention should be paid and reveals the "keys" to a successful dairy enterprise.

The costs for the starting-up of this business are not inhibitory, given the fact that the enterprise will employ 5 only persons. Nowadays, with the huge unemployment rates in Greece, particularly among young people, the turn to the agricultural production seems to be one-way option. The enterprise supports the members of the owner's family with wages according to their positions and from the 3rd year and onwards the unit renders significant dividends, at an annual height of 115.000 euro.

The BP is suggesting an integrated way of producing dairy products that respect simultaneously five basic principles, namely product quality, promotion of Greek traditional dairy

products, low costs for the unit establishment, low production costs and last but not least environmental friendly operation.