

Available online at www.sciencedirect.com**ScienceDirect**

Procedia Economics and Finance 33 (2015) 518 – 527

Procedia
Economics and Finance

www.elsevier.com/locate/procedia

7th International Conference, The Economies of Balkan and Eastern Europe Countries in the changed world, EBEEC 2015, May 8-10, 2015

Dairy farmers' strategies against the crisis and the economic performance of farms

Athanasios Ragkos^{a*}, Alexandros Theodoridis^b, Antonis Fachouridis^c, Christos Batzios^b

^a Department of Agricultural Technology, Alexander Technological Educational Institute of Thessaloniki, 57400 Sindos, Thessaloniki, Greece.

^b School of Veterinary Medicine, Faculty of Health Sciences, Aristotle University of Thessaloniki, P.O. Box 410, 54124 Thessaloniki, Greece.

^c School of Economics, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece

Abstract

Dairy farming in Greece constitutes a particular case of livestock farming, because of its highly entrepreneurial nature. The modern Greek dairy cattle farming is predominantly based in Northern Greece, where more than 80% of Greek cow milk is produced. Since the 2000's the dairy cattle sector is characterized by a rapid increase in the mean size of farms, which permits them to undertake investments in machinery and buildings and to have access to improved genetic material for the achievement of higher productivity. Nevertheless, this development renders dairy farms vulnerable to volatile economic conditions, as they are heavily dependent on capital endowments. The main purpose of this study is to examine the consequences of the economic crisis on the dairy cattle sector and the strategies undertaken by farmers to cope with it. The analysis is based on data from a questionnaire survey of farmers in Northern Greece. Strategies undertaken by dairy farmers in order to face the crisis and to ensure the survival of their businesses are recorded through a set of Likert-scale questions. Technical and economic data are also analyzed in order to examine the economic performance of farms, revealing that the sampled dairy farms are viable, with satisfactory economic results, with capital returns of 6.2% annually. Based on the Likert-scale data, dairy farmers adopt active strategies to face the crisis, by undertaking investments and augmenting their farm sizes, while they deem that the crisis does not have catastrophic results on the profitability of their farms. On the other hand, strategies which entail less expenses and/or diminished productivity are unpopular among dairy farmers. Finally, the vast majority of respondents claim to have seen negative consequences on their farms from the recent measures concerning the prolongation of the duration of fresh milk in retail markets: lower quality, increased vulnerability to international competition, shrinking dairy sector.

© 2015 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Peer-review under responsibility of Department of Accountancy and Finance, Eastern Macedonia and Thrace Institute of Technology

* Corresponding author. Tel.: +30 -2310-999-953; fax: +30 -2310-999-953.

E-mail address: ragkosagrecon@gmail.com

Keywords: Economic crisis, technical and economic indicators, intensive livestock production, fresh milk

1. Introduction

Livestock production, although it stands for almost 27% of the total value of the primary production in Greece (PASEGES 2013), plays a very important social and economic role for some rural areas of the country, which cannot always be captured by published financial data. The economic crisis has undoubtedly influenced the productivity and economic performance of the Greek primary sector in general and of livestock production in particular. According to Karanikolas and Martinos (2012) the average income of Greek farms has been diminished by half from 1994 to 2010. This development can be attributed to various factors. First, production costs have been severely increased due to increased input prices, which were raised by 1 bil.€ or by 22.5% during the 2009 – 2012 period (PASEGES, 2013). The most burdened inputs were the ones crucial to livestock production i.e. feedstuff, whose prices were raised by 31%, reaching 2.12 bil.€ in 2012, and energy, exhibiting a raise of 64%. Second, the generalized lack of liquidity has been a cause of suffocation – literally – of all agricultural enterprises and livestock farms; dairy industries were unable to remunerate farmers on time, this being the cause of late payments from farmers to banks and input suppliers. This type of financial stress became more exhausting for intensive livestock farms which undertook very high investments in infrastructure. Despite the financial opportunities, these investments were primarily realized through loans, but were not designed rationally, were based on limited data and misleading projections of the future, which finally led to an overestimation of their efficiency (Koutsou et al., 2013). This policy of over-financing investments in Greek farms merely disoriented attention from the real problem of the primary sector, the small farm size, which constitutes one of the main sources of limited competitiveness of Greek livestock farming. Theodoridis & Psychoudakis (2008) based on a sample of 165 dairy cattle farms estimated a scale efficiency index of 0.92, indicating a substantial inefficiency in the exploitation of economies of scale. Overall, the failure of these measures reflects the lack of strategic management in Greek farms, which would otherwise “...help to structure the complexity of farm decision-making” (Ondersteijn et al., 2003).

Greek dairy farming is being transformed during the last 15 years. This sector is highly dependent on capital and operates under an intensive production pattern, however it always failed to meet the national demand, even in times of prosperity. Cow milk production remains much lower than consumption: the sector achieves to supply only 40% of domestic consumption. This is due to the fact that the sector is affected by the prevailing Mediterranean conditions, which increase the production cost of feed and the vigorous competition for the use of land by the sectors of crop production (Theodoridis, 2008). Hence, it is expected that within a harsh economic environment dairy farmers should be experiencing severe difficulties. Several questions are then raised: How much has the crisis affected Greek dairy farms? How is it possible that dairy farming survives the crisis? Are there ways to boost its performance?

The main purpose of this study is to examine the consequences of the economic crisis on the dairy cattle sector, which is expected to alter its profile but also to shape new prospect. The analysis is based on data from a questionnaire survey of farmers in Northern Greece, which is the main center of milk production in the country. Strategies undertaken by dairy farmers in order to face the crisis and to ensure the survival of their businesses are recorded through a set of Likert-scale questions. Also, technical and economic data are analyzed in order to examine the economic performance of farms.

2. The dairy sector in Greece

The Greek dairy sector has witnessed great changes during the last decade. The two prevailing trends are reported in Table 1, where it is illustrated that the number of farms has been decreasing every year during the 2003 – 2013 period, while milk production has remained relatively steady. As to the number of farms, it can be seen that only 3686 farms were operating in 2013 compared to 8640 farms in 2003. This corresponds to an 8,2% annual rate of decrease. Despite this reduction, milk production has only been affected marginally, falling by about 6.5% or by 0.7% annually. In fact, from 2003 to 2006 the annual milk production in the country was increased, it then started to decrease slowly and fell under the 2003-2004 threshold in 2011.

The two trends previously discussed are the main causes of a major structural reform in the sector. The number of farms has decreased almost 12 times faster than the annual milk production which illustrates the emergence of large dairy farms of predominantly entrepreneurial nature. The average milk production per farm has been increasing at various rates during the period under examination, yielding an annual increase rate of 8.2%. The constant expansion of dairy farms has facilitated their integration into competitive markets and enabled them to have access to better information, technical support and innovation. As a result, they resorted to hired labor to accommodate their increasing size and became more and more dependent on capital in order to ameliorate their facilities, use improved genetic material and introduce automated production systems. Then, they adopted a highly intensive production pattern to fully develop their investments in buildings and machinery. Despite these characteristics, the new type of dairy farms is still predominantly family-run, fulfilling the criteria by Gasson & Errington (1993) conventionally describing a farm family business.

The modern Greek dairy cattle farming is based in the northern part of the country (Macedonia, Thrace and Thessaly), where more than 80% of Greek cow milk is produced, almost 80% of dairy cattle are reared and more than 70% of farms are situated (www.elogak.gr). The fresh milk market in Greece is oligopolistic with three firms in hold of 63.9% of the whole market share (<http://www.marketingweek.gr/>).

Table 1. Developments in the Greek dairy sector during the 2003-2013 period.

Year	Farms		Production		Average production	
	Number	Rate (%)	th.ton.	Rate (%)	ton/farm	Rate (%)
2003-2004	8640		671		77.7	
2004-2005	7730	-10.5	695	3.6	89.9	15.7
2005-2006	6856	-11.3	742	6.8	108.2	20.4
2006-2007	6270	-8.5	736	-0.8	117.4	8.5
2007-2008	5627	-10.3	716	-2.7	127.2	8.3
2008-2009	5074	-9.8	699	-2.4	137.8	8.3
2009-2010	4561	-10.1	682	-2.4	149.5	8.5
2010-2011	4259	-6.6	666	-2.3	156.4	4.6
2011-2012	3930	-7.7	642	-3.6	163.4	4.5
2012-2013	3686	-6.2	627	-2.3	170.1	4.1
10-year period	-4954	-57.3	-44	-6.6	92.4	118.9
Average annual rate (%)		-8.2		-0.7		8.2

Source: www.elogak.gr (processed data)

3. Strategies of livestock farms against crises and financial stress

The economic theory states that an economic unit will continue to operate if its marginal revenue exceeds its production costs. This basic notion, nonetheless, is not always applicable in agriculture and livestock production; there is a massive body of literature examining the survival of farms – especially of European family farms – under difficult economic, social and historic conditions. One explanation has been provided through the multifunctionality of the “European Model of Agriculture” (Casini, 2004) and of the farming profession in particular. The multifunctional character of agriculture impels farmers to redefine their scopes in order to integrate them in a modern framework which embraces economic, environmental and social aspirations (Deverre, 2002), while Cayre et al. (2004) recognize social and ethical motivations in engaging with farming.

Extensive farming systems have the ability to survive when the external conditions are adverse because they are not heavily dependent on capital and are able to resort to “free” family labor while they expect circumstances to ameliorate (Holzner, 2008). Their most common strategy is the diversification of the production pattern (Meert et

al., 2005). This entails the introduction and/or substitution of a variety of production activities or a shift in management practices – such as the choice of new sales methods, less input use, cuts in hired labor, less provision of feedstuff and more grazing (DiNapoli & Bleiwas, 2010, Cessna, 2010) - or complementary employment in other economic sectors (pluriactivity, Price and Evans, 2006). These three types of diversification are discussed by Meert et al. (2005) and are characterized as “agricultural”, “structural” and “income” diversification respectively.

Central to the success of a farm is the ability of the farmer/manager to design a master plan which reflects their vision for the future of the business. This constitutes the gist of strategic management (David, 2001), which, according to Ondersteijn et al. (2003), is applicable to the primary sector. This approach assumes that the farmer is responsible for the choice of the strategies to confront a crisis. Nevertheless, the role of strategic management has been questioned by Darnhofer (2010), who focused on the notion of resilience of family farms, as a source ensuring their reproduction through time. Resilience-based approaches encompass the dynamic and turbulent nature of future events in an uncertain environment and examine the factors that influence a farm’s ability to respond to all types of changes in the external environment and the formulation of defense mechanisms to face future problems.

Meert et al. (2005), based on the work of Bowler (1992) and Ilbery (1992, 2001), discerned three types of strategies undertaken by farms under crisis, as follows:

I. Maintaining the full-time, profitable and mainly food-producing role of a viable agricultural enterprise. This can be achieved either by adopting an “industrial model” – a highly intensive and specialized production path – or through “agricultural diversification”

II. “Income” or “structural” diversification as discussed above

III. Marginalisation of the farm as a profitable enterprise, which comprises constraints in farm operation such as reduced farm activity, part-time farming and semi-retirement

A study of types of actions undertaken by beef livestock farmers (Ingrand et al., 2006) distinguishes various sociological types (farm functioning, sources of flexibility, farmers’ visions for their farms and strategy/behavior) whose outcomes are grouped into two main types of strategies: “Act upon” and “Go with the flow”. “Act upon” stands for active actions serving to face the crisis/problem directly, such as the formulation of collective actions, increase in farm size, acquisition of more technical skills and amelioration of the internal organization of farms, which can lead to a stable system able to confront uncertainty. “Go with the flow”, on the other hand, includes strategies based largely upon the past virtues of the production system. These include the use of experience and robustness which stem from the operation of livestock farming systems and/or particular farms for centuries, in order to assist farms to defend themselves against harsh conditions and then return to their initial state, thus adopting an inert behavior. Other actions of this type include diversification, as discussed above, in order to provide flexibility and allow farmers to benefit from opportunities that might arise.

Another classification of strategies to face crises in the livestock sector has been proposed by Ondersteijn et al. (2003). The authors employed an explanatory factor analysis to group a set of 21 strategies into broader categories with common characteristics. The results yielded three distinct types of strategies - namely process control, diversification and growth - all of which exhibit similarities with the work of Meert et al. (2005). Process control is based on changes in the production process and aims at ameliorating the quality of products, much like an “income” type of diversification. The second type encompasses “agricultural” diversification. Finally, the third one “Growth” is much an “Act upon” strategy (Ingrand et al., 2006), including active actions linked to the expansion of the farm size.

The literature review in this section reveals that the survival of extensive family farms in Europe has been examined theoretically and practically. However, this is not the case for the intensive production systems in the continent, which are also family-ran but do not exhibit the same structural features with the extensive ones. In the remainder of this paper the basic types of strategies described above are examined concerning their suitability for entrepreneurial family-ran dairy farms in Northern Greece and the degree to which farmers have resorted to them in order to face the crisis.

4. Methodological framework

The analysis in this paper uses primary data from a survey of dairy farms in Northern Greece. The survey was

undertaken in late 2014 in collaboration with the Holstein Association of Greece (HAG), which is the official Union in charge of genetic improvement of the Holstein cattle breed in the country. The Association provides a range of services to its members, including record-keeping of yields and technical support. HAG currently has 84 members, all of highly entrepreneurial organization, which account for more than 25% of the total cow milk production in Greece; of them, 39 participated in the survey.

Respondents were approached independently by enumerators and interviews were conducted using a carefully designed questionnaire, which consisted from two parts. The first one aimed at recording the current state in the farm, including questions about technical and economic features of farm management: fixed capital endowments (buildings and machinery), crop production for feedstuff (land rent, purchased inputs), purchased feedstuff, veterinary expenses and other expenses related to animal production, as well as milk yields and prices, meat production and prices, income support payments etc.. The second part included a set of Likert-scale questions about farmers' opinions regarding the repercussions of the crisis and the strategies they undertake to face them. These strategies included "agricultural" diversification (reduction in feedstuff provision and in their quality, reduction in veterinary expenses, changes in the choice of production activities), "structural" diversification (more family labor, engagement in collective product sales) and "income" diversification (diminishing herd size, pluriactivity, cease of dairy farming). It is obvious that both "Go with the flow" and "Act upon" strategies were proposed to farmers. Finally, a set of Likert-scale questions were posed to respondents regarding their opinions about the extension of shelf-life of fresh milk in retail markets, which was introduced by law in 2014, defining the duration of pasteurized milk to seven days maximum, compared to five days until then. Data were analyzed in order to calculate technical and economic indicators illustrating the economic operation of farms and their performance (descriptive analysis).

5. Results and discussion

The main technical and economic indicators describing the operation of the sampled farms are presented in Table 2. The average farm reared 140.4 dairy cows – not including bulls and heifers. The mean milk production was 1118.3 ton./year, corresponding to a mean milk yield of almost 8 ton./cow (7,963.6 kg/cow) which is slightly lower than the one officially reported by the Holstein Association for 2014 (8,156 kg/cow). The mean cow milk price was 0.447€/kg for the sample, which exceeds the mean cow milk price for the whole country (0.419€/kg) reported by ELOGAK (www.elogak.gr) at the time of the survey (November 2014). The considerably large size of these farms is the main reason why they benefit from relatively high milk prices.

Table 2. Technical and economic indicators of the average dairy farm

Average size (number of cows)	140.4
Milk production	
Milk production (ton./year)	1118.3
Milk yield (kg/cow/year)	7963.6
Mean milk price (€/kg)	0.447
Cultivated land	
Non-irrigated (ha/cow)	0.08
Irrigated (ha/cow)	0.20
Labor (h/cow)	
Family members (h/cow)	48.2
Hired workers (h/cow)	49.0

The indicators reported in Table 2 reveal two more important characteristics of dairy farms in Northern Greece. The first involves the production of feedstuff on-farm and the second the use of hired labor. Considering feedstuff, the average farm cultivates 0.08 ha of non-irrigated land (mainly wheat) and 0.2 ha of irrigated land (mainly maize and lucerne) per cow, thus covering a considerable part of the nutritional needs of animals. When it comes to labor,

despite the family nature of the sampled farms, hired workers are necessary to accommodate their large size. It can be seen that hired labor is of almost equal importance for these farms as family labor (49.0 h/cow and 48.2 h/cow respectively).

Table 3 presents the expenses of the sampled farms. As expected, the percentage of capital expenses is very high (88.9%) which illustrates the high degree of intensification in the production process. In more detail, variable cost account for almost two thirds of the total expenses, with the main source being purchased feedstuff (48.1%). In spite of cultivating a considerable acreage of feedstuff crops, the variable cost of crop production do not exceed 6.7% of the total cost. The remaining part of the variables expenses accounts for veterinary expenses, cleaning, other payments etc. Labor only accounts for 8.4% of the total cost – including the wages of hired workers as well as wages of family members - and land rent stands for only 2.7% of total production cost.

By examining the structure of capital expenses of farms, two features are of particular interest. First, the high expenses for animal nutrition are the result of the constant increase in the prices of inputs. Purchased feedstuff and crop production account for almost 55% of the total expenses and seem to have remained almost steady during the past five years, compared to the survey of Mitsopoulos et al. (2011), where the percentage was 57.9%. Second, farms rationalize their performance by steadily increasing their size and variable expenses, thus using their infrastructure at full capacity. This is verified by the fact that in 2003 fixed costs accounted for 48% of capital expenses (Theodoridis, 2008), showing that farmers had already taken a strategic decision to expand, unlike other farmers in Greece, who lacked a concise development plan.

Table 3. Expenses of dairy farms by production factor

	€	%	€/cow
Land (Rent)	15,390.9	2.7	109.6
Labor (Wages)	47,069.6	8.4	335.2
Capital	501,235.0	88.9	3569.3
<i>Variable</i>	374,053.2	66.4	2663.7
Purchased feedstuff	270,952.8	48.1	1929.5
Other expenses	65,532.0	11.6	466.7
Crop production	37,568.4	6.7	267.5
<i>Fixed</i>	127,181.8	22.6	905.7
Total	563,695.5	100,0	4,014.1

Based on the technical and economic data, the main financial results were calculated for the average farm (Table 4). The gross output is 4,051.5 €/cow, with the main product being milk, as it contributes by 87.8% to the total income. The importance of meat sales is much lower (6.7%), while the various types of income support stand for the least part of the total gross income – only 5.5%. This result conforms to that of Theodoridis (2008), who found that the contribution of direct payments in gross revenue was 5.9% for the large size farms that reared more than 80 cows. This low percentage indicates the competitiveness of the system and is contrary to the trend - pointed out by Karanikolas and Martinos (2012) -that after 2008 most of the gross output of Greek farms comes from subsidies and policy support schemes. Hence, in a time when Greek farms depend their survival on subsidies and are vulnerable to policy changes in the EU, entrepreneurial dairy farms seem to be able to survive at their own expense, using income support as a supplementary development tool.

As described in the previous section, the dairy farms of the sample are of entrepreneurial nature. This means that their performance and their prospect should be judged with economic criteria. For this purpose, three financial results should be calculated. The first one is the net profit, which is positive but low (5,138€ (36.6 €/cow)). This finding is of particular importance for the future of the sector, as it constitutes a clear indication of its potential to survive the crisis; a positive net profit shows that it is worth that a dairy farmer continues the operation of their farm. Apart from the positive net profit, the gross margin is quite satisfactory (1,387.3 €/cow), which also implies that the operation of the dairy farm is profitable in the short run. When fixed costs are not taken into account, the gross

margin is considerably higher than the net profit. This means that the dairy farm is able to survive by covering all its regular variable costs for a period of time and wait until the external economic environment becomes more favorable in order to expand its operation. Another purely economic criterion reflecting the economic performance of the sector is the capital return, which is calculated to 6.2%. This rate of return is very satisfactory within the current financial environment, where alternative uses of capital are scarce because of limited investment opportunities. Overall, it can be stated that despite the harsh conditions under which the system operates, its economic performance points to its continuation.

As can be seen in Table 4, the farm income is 945 €/cow. This positive financial result shows that the average dairy farm is capable of surviving and providing an adequate income to the farmer, even when it is not considered as an enterprise, but rather as a family farm. Indeed, despite the integration of these farms in market competition, it is difficult to discern their entrepreneurial element from the family one. Thus, the computation of both types of financial results is necessary in order to understand the following results (Tables 5 and 6), which refer to the repercussions of the crisis on the farm family businesses and the corresponding strategies of farmers.

Compared to the ones reported for the 2008-2009 period by Mitsopoulos et al. (2011), all the financial results presented in Table 4 have been decreased. The authors reported financial results for typical farms of various sizes, with the one rearing more than 151 cows being comparable to the average farm reported here. In detail, although the gross output exhibits only a marginal reduction of almost 40€/cow, production cost has been increased by 37.6% over a six-year period because of consecutive increases in feedstuff and energy prices. As a result, all the remaining financial results exhibit a significant reduction of the same magnitude: the gross margin has been reduced by 35.6% and capital return by 10.3% since 2009. However, the adverse effects of the crisis are even more severe if the farm is examined as a family business: the farm income is reduced in half – from 1917.7€/cow to 945.0 €/cow, reflecting the trajectory that the agricultural incomes have followed in Greece, as reported by Karanikolas and Martinos (2012).

Table 4. Financial results of dairy farms

	€	€/cow
Gross output	568834.3	4051.5
<i>Milk (%)</i>	499515.4 (87.8%)	3557.8
<i>Meat (%)</i>	37843.2 (6.7%)	269.5
<i>Direct payments (%)</i>	31475.7 (5.5%)	224.2
Production costs	563695.5	4014.9
Gross margin	194781.1	1387.3
Net profit	5138.8	36.6
Farm income	132672.1	945.0
Capital return (%)	6.2	

Table 5 presents farmers' perceptions regarding the effects of the economic crisis on the dairy sector and on their farms. The most popular answer was that they plan to continue dairy farming, despite the fact that their incomes have been diminished due to the crisis. In fact, this reduction is not only perceived, but real as it was indicated from the comparison of the financial results with the ones calculated six years ago. Faced to this situation, the farmers clearly were in favor of a dynamic approach ("Act upon") to overcome the crisis: they planned to make investments (mean 3.78) and still believed that the profession was profitable (3.57). The remaining statements were ranked very low, which indicates that they did not sense any opportunities for the sector (1.95) nor did they believe that the sector had become an attractive investment option for young people (2.05). In all, respondents described a rather difficult situation for dairy farming, which they, nonetheless, planned to face in a dynamic manner.

Table 6 presents farmers' responses concerning their choices of proper strategies to deal with the negative effects of the crisis. The most important finding is that none of the proposed strategies was particularly popular among respondents, indicating that the average respondent disagreed with the adoption of all these strategies. It can be seen,

however, that the least preferred strategies are those indicating a passive behavior (“Go with the flow”), including changes in the nutritional management, changes in the production type and a reduction in herd size. Such strategies are not compatible with the highly intensive production pattern of these farms, because they would require operation below their production capacity. Consequently, despite the fact that nutrition expenses account for more than half of the total costs of dairy farms, farmers are not willing to cut down on them, because this would mean a passive behavior leading to a “vicious cycle” of further reduction in their economic performance. Besides, as mentioned above, these farmers have pursued steadily to achieve the ideal use of their infrastructure through increased capacity, thus the adoption of such passive strategies would constitute a setback. Thus, diversification is not the preferred type of response against the crisis, while there is strong evidence that farmers seek to continue a strategy based on expansion (“Act upon”), investing on larger farm size. This finding is somewhat controversial compared to Karelakis et al (2012), who found that the crisis has affected severely the herd management practices of livestock farmers (less feedstuff provision, more application of grazing) in North-Eastern Greece.

Table 5. Effects of the crisis on dairy farms and the dairy sector

	Mean	Standard deviation
I plan to continue dairy farming	4.49	0.90
My income has been decreased because of the crisis	4.00	1.33
I will make investments to improve the profitability of my farm	3.78	1.27
Dairy farming is still profitable	3.57	0.99
Dairy farming has been affected more severely by the crisis compared to other sectors	2.32	0.91
Young people are entering the dairy farming profession	2.05	1.08
The crisis has created new opportunities for the sector	1.95	1.10

* Responses were given based on a 1-5 Likert scale (1 = Total disagreement, 2 = Disagreement, 3 = Neither agree nor disagree, 4 = Agreement, 5 = Total agreement)

Respondents seem to be less negatively predisposed against strategies which entail collective action. There is more than one reason explaining this finding. First, there are several paradigms of recent efforts of livestock farmers founding Cooperatives and Producer Groups, with the initial results being encouraging. Second, respondents are already members of the Holstein Association, which indicates that they are favorable towards cooperation. Third,

Table 6. Proposed strategies for dairy farmers to face the crisis

	Mean	Standard deviation
Milk sales in Greece through Cooperatives	2.94	1.43
Reduction in veterinary expenses	2.71	1.40
Increase of family labor	2.68	1.32
Milk sales abroad through Cooperatives	2.53	1.42
Pluriactivity	1.76	1.13
Reduction in herd size	1.62	1.02
Less feedstuff – More grazing	1.59	0.92
Change in the production type of the farm	1.44	0.70
Reduction in the quality of feedstuff	1.26	0.45

* Responses were given based on a 1-5 Likert scale (1 = Total disagreement, 2 = Disagreement, 3 = Neither agree nor disagree, 4 = Agreement, 5 = Total agreement)

their business development strategy has been largely based on increasing their size, so they comprehend the potential benefits from collectiveness. This relative preference towards collaboration verifies for once more the adoption of “Act upon” strategies, which aim, in addition, at the formulation of a steady system. Apart from cooperation, the only managerial practices that farmers do not disagree completely with are the use of more family labor and the reduction in veterinary expenses. The former was expected because family members already contribute half of the labor requirements in the farm and family labor is always a source of cost savings for family farms. Veterinary expenses, on the other hand, can be controlled appropriately, at a level which would not harm the productivity of the herd without burdening the production cost excessively.

In Table 7, the results regarding farmers’ attitudes towards the extension of shelf-life of fresh milk are presented. The most popular opinion is that this policy will bring about a reduction in producer prices, which is verified by official data. According to ELOGAK the mean producer price for the period January-July 2014 is steadily diminishing from 0.4509€/lt to 0.4314€/lt and is reduced by almost 0.01€/lt compared to the same period in 2013 (www.elogak.gr). Another type of awareness concerns the future of the sector, as many farmers believe that these measures will shrink the Greek dairy sector (4.41) and have already rendered it vulnerable to international competition (4.27). The final beneficiaries of these changes will be large dairy industries (4.36) which will expand at the expense of smaller local dairy industries (3.95); considering that the Greek dairy market is oligopolistic, with No benefits can be expected for consumers (4.27), mainly because the fresh milk sold through this new scheme will be of lower quality (3.71). Concerning the future of dairy farming, respondents seem to agree that although these new measures aim especially at impressing the public (4.27), they will cause conflicts between producers and dairy industries (3.73).

Table 7. Respondents’ opinions regarding the extension of shelf-life of fresh milk

The extension of shelf-life of fresh milk	Mean	Standard deviation
Will bring about a reduction in producer price	4.46	0.87
Will shrink the sector	4.41	0.83
Has great benefits for large dairy industries	4.36	0.96
Has no benefits to consumers	4.27	1.12
Renders the Greek dairy sector vulnerable to international competition	4.27	1.07
Aims at impression and has no actual benefits	4.27	0.99
Will force small dairy industries to close	3.95	1.47
Will cause conflicts between producers and dairy industries	3.73	1.12
Will affect adversely the quality of fresh milk	3.71	1.49
Constitutes an opportunity for the development of the sector	1.68	0.82

* Responses were given based on a 1-5 Likert scale (1 = Total disagreement, 2 = Disagreement, 3 = Neither agree nor disagree, 4 = Agreement, 5 = Total agreement)

6. Conclusions

The analysis in this paper revealed that the Greek dairy sector has demonstrated a considerable ability to cope with the economic crisis, unlike many other sectors of the primary sector. Their strategy against the crisis is essentially the one that they undertook about 15 years ago, when they drew a strategic plan aiming at their expansion; they are now still active and dynamic and seek to continue their investments. Dairy farmers constitute a successful example of implementation of investment support schemes set up by the Common Agricultural Policy, as the investments they undertook were carefully planned and implemented. As a result of this strategic planning, dairy farms are actually fairly competitive and almost not at all dependent on income support schemes, while the Greek primary sector has followed an opposite path.

Dairy farming is not deprived of the structural problems of the Greek primary sector; however the examination of its behavior against the crisis has yielded some important observations which may serve as examples for other sectors. The adoption of an entrepreneurial rationale is necessary for Greek farms, as it will allow them to draw integrated strategic plans, undertake useful investments and to become more oriented towards competitive markets and innovation. This way, Greek farms will be able to develop a dynamic stance towards the current and future crises, thus becoming more resilient and being able to ensure their reproduction over time.

This survey provided some insights as to the strategies that farmers undertake against the crisis, but does not explain their motivations i.e. the factors leading them to adopt this type of behavior. A more thorough examination of the reasons why dairy farmers decide to “Act upon” despite the current economic uncertainty would be even more useful for policy making, assisting the design of targeted policies, by discerning “best practices” and the “correct” types of motivation worth providing through the implementation of farm policies. In addition, this in-depth examination would explain whether the continuation of almost the same strategies for the last 15 years and under completely different economic conditions could be proven efficient in the future or would be the cause of problems.

References

- Bowler, I., 1992. ‘Sustainable Agriculture’ as an alternative path of farm business development. In: Bowler, I.R. et al (Eds.), *Contemporary Rural Systems in Transition, Vol. 1: Agriculture and Environment*. CAB International, Wallingford, pp 237–253.
- Casini, L. et al, 2004. Research report on the analytic multifunctionality framework. Report of the FP6 Research Project MEA-Scope.
- Cayre, P., et al, 2004. Multifonctionnalite de l’ agriculture: Quelle motivation de l’ agriculteur ? *Les Cahiers de la Multifonctionnalite* 5, 5-16.
- Cessna, J., 2010. Situation and Outlook for the U.S. Dairy Industry. *Agricultural Outlook Forum*, retrieved on October 2010 from: http://www.usda.gov/oce/forum/2010_Speeches/Speeches/DairyOutlook2010.pdf
- Darnhofer, I., 2010. Strategies of family farms to strengthen their resilience. *Environmental Policy and Governance* 20(4), 212-222.
- David, F.R., 2001. *Strategic Management Concepts*. 5th Edition, Prentice Hall, Upper Saddle River.
- Deverre, C., 2002. Les nouveaux liens sociaux autour du territoire. *Entretiens de Pradel “Agronomes et Territoires”*, 12-13 Septembre 2002, Mirabel.
- DiNapoli, T. P. and Bleiwas, K.B., 2010. The Role of Agriculture in the New York State Economy. *New York State Comptroller, Report* 21-2010.
- Gasson, R. and Errington, A., 1993. *The Farm Family Business*. Wallingford: CAB International.
- Holzner, B.M., 2008. Agrarian restructuring and gender – designing family farms in Central and Eastern Europe. *Gender, Place and Culture* 15(4), 431-443.
- Ilbery, B., 1992. State assisted farm diversification in the United Kingdom. In: Bowler, I.R. et al (Eds.), *Contemporary Rural Systems in Transition, Vol. 1: Agriculture and Environment*. CAB International, Wallingford, pp. 100–118.
- Ilbery, B., 2001. Alternative farm enterprises on the urban fringe: evidence from the UK. Symposium ‘Openruimtefuncties onder verstedelijkingsdruk’ Gent, Belgium.
- Ingrand, S. et al, 2006. Non material resources mobilized by farmers and flexibility of livestock farming systems: two concepts linked to decision making and sustainability. *Proceedings of the 57th Annual Meeting of the European Association for Animal Production*, Antalya, Turkey, pp. 17-20.
- Karanikolas, P. and Martinos, N., 2012. Greek agriculture facing the crisis: Problems and perspectives. Retrieved on May 2013 from: <http://ardinixi.gr/archives/3811>
- Karelakis C. et al, 2012. Management of livestock farms during a period of economic crisis. *Proceedings of the 12th Panhellenic Conference of Agricultural Economics*, Thessaloniki, Greece.
- Koutsou, S. et al, 2013. Family and collective strategies to face the crisis in rural space: The case of sheep and goat farms. *Proceedings of the 11th Scientific Conference (ERSA – GR) “Agricultural Economy, rural areas, space, Regional and Local Development”*, Patras, Greece, http://grsa.prd.uth.gr/conf2013/77_koutsou_etal_ersagr13.pdf
- Meert, H. et al, 2005. Farm household survival strategies and diversification on marginal farms. *Journal of Rural Studies* 21(1), 81-97.
- Mitsopoulos, I. et al, 2011. Technical and economic analysis of the dairy sector in Central Macedonia. 3rd Panhellenic Conference on Animal Production Technology, Thessaloniki, Greece, pp. 513-524.
- Ondersteijn, C. J. M. et al, 2003. Identification of farmer characteristics and farm strategies explaining changes in environmental management and environmental and economic performance of dairy farms. *Agricultural Systems* 78(1), 31-55.
- PASEGES, 2013. *Recent developments in the agricultural economy of Greece*. Athens, Greece
- Price, L. and Evans, N., 2006. From “Good as gold” to “Gold diggers”: Farming women and the survival of British family farming. *Sociologia Ruralis* 46(4), 280-298.
- Theodoridis A., 2008. *Effects of the Common Agricultural Policy on dairy sector*, PhD Dissertation, School of Agriculture, AUTH (in Greek).
- Theodoridis A. and Psychoudakis A., 2008. Efficiency measurement in Greek dairy farms: stochastic frontier vs. data envelopment analysis. *International Journal of Economic Sciences and Applied Research* 1(2), 53-66.
- Whatmore, S. et al, 1987. Towards a typology of farm businesses in contemporary British agriculture. *Sociologia Ruralis* 27(1), 21–37. <http://www.marketingweek.gr/default.asp?pid=9&la=1&arId=50836>. Retrieved on 2 May 2015.