Assessing the main characteristics of sheep and goat milk production value chains at farmer level: Opportunities and constraints

Tzouramani I., Hadjipavlou G., Sossidou E., Ligda C.

in

Napoléone M. (ed.), Ben Salem H. (ed.), Boutonnet J.P. (ed.), López-Francos A. (ed.), Gabiña D. (ed.).
The value chains of Mediterranean sheep and goat products. Organisation of the industry, marketing strategies, feeding and production systems

Zaragoza : CIHEAM
Options Méditerranéennes : Série A. Séminaires Méditerranéens; n. 115

2016
pages 163-167

Assessing the main characteristics of sheep and goat milk production value chains at farmer level: Opportunities and constraints

I. Tzouramani[1], G. Hadjipavlou[2], E. Sossidou[3] and Ch. Ligda[3]

[1]Agricultural Economics Research Institute, Hellenic Agricultural Organization DEMETER (Greece)
[2]Animal Production Section, Agricultural Research Institute, Lefkosia (Cyprus)
[3]Veterinary Research Institute, Hellenic Agricultural Organization DEMETER (Greece)

Abstract. In the frame of the DoMEsTIc project (EU FP7 ARIMNet), one of the main objectives was to undertake an in-depth assessment of the information related with the utilized marketing channels for local sheep and goat milk and milk products. The identified livestock distribution channels are influenced by particular interrelated factors. Such factors are linked with the production and profit orientation (i.e. sales price, quantity of milk, income), production cost and product differentiation, loyalty, speed of payment, personal relationships, isolation of the farm and determine the profile of small ruminant farmers and their marketing strategies. Using the framework of the value chain, this study identified the different actors, assessed the governance mechanisms in the value chain, analysed the opportunities for upgrading within the chain and revealed the constraints that prevent the development of the sheep and goat milk value chain with special focus on the farmers' point of view. In this paper, results from two case studies from Greece and Cyprus are presented. Data were collected by semi-structured personal interviews with farmers. All types of the supply chain were identified in the survey. The main characteristics of these supply chains revealed both common and diverse issues relating to the two case studies. Finally, this study will try to offer applied insights on ways to improve and propose alternative policies and optimal interventions in the value chain of local sheep and goat breeds to safeguard the livestock farmers.

Keywords. Small ruminants – Dairy sector – Value chains – Farmers' opinions – Sustainability.

Quelques considerations sur les caractéristiques principales des chaînes de valeur du lait ovin et caprin au niveau des éleveurs : opportunités et contraintes

Résumé. *Un des principaux objectifs du projet DoMEsTIc (ARIMNet EU FP7), était de réaliser une analyse de l'information relative aux chaînes de commercialisation utilisées pour le lait et de produits laitiers de races ovin et caprin locales. Les canaux de distribution identifiés sont influencés par des facteurs interdépendants. Ces facteurs sont liés à la production et à l'orientation de profit (le prix de vente, la quantité de lait, revenu), coût de production et la différenciation des produits, de loyauté, de rapidité de paiement, les relations personnelles, l'isolement de la ferme et déterminent le profil des éleveurs et de leurs stratégies de commercialisation. En utilisant le cadre de la chaîne de valeur, on a identifié les différents acteurs, évalué les mécanismes de gouvernance de la chaîne de valeur, analysé les possibilités d'améliorer la chaîne et illustré les contraintes qui empêchent le développement de la chaîne de valeur, regardées selon le point de vue des éleveurs. Dans le document présent, les résultats de deux études de cas, de la Grèce (Ipeiros) et de Chypre sont présentés. Les données ont été collectées par des interviews semi-structurées et personnelles des éleveurs. Tous les types de la chaîne d'approvisionnement ont été identifiés dans l'enquête. Les caractéristiques principales dans les deux études de cas révèlent des éléments communs et aussi des diverses éléments. Finalement, le projet vise à présenter des idées sur les façons d'améliorer la chaîne de valeur des races locales ovin et caprin, et à proposer de nouvelles politiques et interventions optimales pour soutenir les éleveurs de petits ruminants.*

Mots-clés. *Petits ruminants – Filière laitier – Chaînes de valeur – Opinions des éleveurs – Durabilité.*

I – Introduction

In the Mediterranean region, sheep and goat farming is an important and well-established activity, a traditional way of farming, a significant provider of income, employment, environmental protection, and social cohesion (de Rancourt *et al*., 2006). However, the small ruminant sector is currently at a critical stage in its development facing threats and opportunities (Nardone *et al*., 2004; Kopke *et al*., 2008; Thornton, 2010; Gaspar *et al*., 2011). In total, the number of sheep and goats has been decreasing slowly since the 1990s. At EU level, the range of sizes and structures is very wide while European sheep and goat holdings differ greatly. On the other hand, nowadays, there is a strong consumer demand for the Mediterranean dairy products with strong market recognition in combination with a dynamic trend in demand for local products (Dubeuf *et al*., 2010). All these issues open a window of opportunity for breed specific milk products. Challenges on Common Agricultural Policy (CAP), changes in consumption patterns, market forces and policy interventions in conjunction with the need for research and development in the field of networking and organizing value chains are essential factors for the sheep and goat breed sector.

Case studies from four countries of the Mediterranean region (Greece, France, Cyprus and Morocco) were analysed in the frame of the DoMEsTIc project (ARIMNet initiative in the EU 7th Framework Programme) in order to assess the associations between the structure of the farming systems and the characteristics of the local sheep and goat breeds with the sector's sustainability. One of the main objectives was to undertake an in-depth assessment of the information related to the utilized marketing channels for local sheep and goat milk products. In this paper, results from two case studies in Greece and Cyprus are presented. These countries Greece and Cyprus have common and diverse issues on the small ruminant sector.

An overarching objective of the DoMEsTIc project is to explore the relationship between local livestock and market opportunities. It tried to analyse the identified livestock distribution channels and the particular interrelated factors linked with the production and sales price, the quantity of milk, income contribution, and product differentiation, loyalty, the speed of payment, personal relationships and determine the profile of the small ruminant farmers and their marketing strategies. Moreover, another focus of this study was to determine the core constraints that farmers have recognized for the sector and to describe the strategies that should be followed in order to support the sustainability of the sector according to their opinion.

II – Materials and methods

The survey was conducted through field and personal interviews to farmers based on a structured questionnaire designed to cover not only technical issues but also the main factors that could have an effect on the choice channel decision. In Greece, the survey took place in the region of Ipeiros, which is considered as a Less Favoured Area. Sheep-goat farming plays a significant role in the livelihoods of farmers. The survey was conducted in collaboration with the Association of Pastoral Farmers of Ipeiros and only farmers having more than 100 heads of sheep or goats and have both their summer and winter farm location in the county of Ioannina were considered for the sampling. In total 32 questionnaires were collected. The criteria for including a farm in the survey were the location of the farm, the size, the practicing of transhumance and the willingness to participate in the survey.

In Cyprus, a proportional random stratified method was employed to determine the reliable sample size per district after setting two prerequisites for farm inclusion. A farm had to have 100 animals or more and for the farms to have a statistically sound geographical distribution in the five districts that are under the control of the sovereign Republic of Cyprus; Lefkosia, Lemesos, Larnaca, Paphos, Ammochostos. A total of 158 farmers were interviewed.

The questionnaire that was developed for the survey included several sections covering the farmer's profile, the farm and the production system, information on performance recording, the animal products and the economics of the farm. More specific in the last section, factors like price, price satisfaction, quantity, payment issues, and availability of contracts, oral or written, transaction costs (information, negotiation and monitoring costs) were collected in order to profile farmers according to these characteristics. All information was collected from late 2012 to early 2013.

A χ^2 analysis was performed to describe the profile of farmers using each marketing channel regarding farm and farmer characteristics using Nlogit version 5.

III – Results and discussion

In our study, small ruminant farmers utilized mainly formal channels and handled different volumes of the produced sheep and/or goat milk quantity. Sheep and goat farmers used two main marketing channels to distribute their milk, either a milk industry, private or cooperative or small dairies. In Greece, in the Ipeiros region, the first choice among the farmers selling the sheep/goat milk was to sell to the cooperative milk industry Dodoni; 85.7% of farmers use this distribution channel. In Ipeiros area, the Dodoni establishment used to be the leader in the dairy industry. Since 2013, this cooperative operates under a private status. 14.3% of farmers use the marketing channel of small dairies. Few farmers are selling in two market outlets. 70% of Cypriot farmers distribute their milk production directly to the milk industry, 21.2% to the small dairies, and 5.8% to the cooperative milk industry (Table 1).

On average sheep and goat farmers are selling larger quantities of milk to the milk industry than to small dairies. Dairy industries determine the milk prices and livestock farmers are prices, takers. In Cyprus, the average sheep milk price paid by the milk industry was 0.8992 euros while in small dairies it was 0.9086 euros per kg of milk and for the cooperative milk industry it was 0.8733 euros per kg. The price offered by the milk industry had more variability. On average goat farmers received an average price of 0.5635 euros per kg from the milk industry, 0.5736 euros per kg from the small dairies and the average price 0.5378 euros per kg from the cooperative milk industry.

In the Ipeiros area of Greece, prices either for sheep or goat milk were higher than the mean price of the country (Tzouramani *et al.*, 2013). The farmers received better prices, which was due to a special price policy of the Dodoni dairy industry. The average sheep milk price was 1.0188 euros per kg offered by the cooperative milk industry while small dairies offered a higher price 1.1750 euros per kg but with bigger variability. The average goat milk price was 0.57 euro per kilo.

The analysis indicated that farmers (both in Ireiros and Cyprus) who prefer to sell their milk to the milk industry (private or cooperative) instead to small dairies have larger flocks ($\chi^2 = 9.662$, $p \leq 0.022$). The greater amount of milk produced showed a relationship with the larger herd size and with the large grazing land. They are using performance recording for their farm, and the milk contribution to their income is significant ($\chi^2 = 13.485$, $p \leq 0.004$) for them. The total number of animals depends on the selling price of sheep milk and the method of payment. These factors indicate the level of farm investment, which motivates them to seek out channels that can accept large quantities of milk, in adequate price and tries for a satisfactory method of payment.

However, livestock farmers mentioned that marketing channels are organized on the dyadic basis, and their relationships are built mainly on trust. There are limited opportunities to negotiate the quantities and prices. In Ipeiros, the flow of information is better among farmers and also the engagement in a process for the better value of the production down the chain. In both countries, sheep and goat milk are directed for special traditional cheeses with high demand, highly appreciated by the consumers, either PDO feta cheese in Greece or halloumi cheese in Cyprus. The milk industry has to pay a significant role in setting quality specifications, supporting the issue of certification

Table 1. Profile of farmers according to distribution channels in Ipeiros, Greece and Cyprus

	Ipeiros, Greece			Cyprus			
	Small dairies	Coop milk industry	Total	Milk industry	Small dairies	Coop milk industry	Total
Marketing Channel (%)	14.3	85.7	100.0	70.2	21.2	5.8	100.0
Farm Characteristics							
Flock size	402 (±418)	343 (±140)	351 (±143)	514* (±452)	404 (±214)	612 (±548)	501 (±418)
Mean sheep milk price(€/kg)	1.1750 (±0.12)	1.0188 (±0.07)		0.8992 (±0.13)	0.9086 (±0.06)	0.8733 (±0.05)	
Sheep milk production (kg)	35,050 (±21,673)	36,420 (±17,238)	36,191 (±17,521)	72,083 (±95,653)	50,560 (±33,683)	68,908 (±52,811)	66,917 (±82,968)
Mean goat milk price (€/kg)	0.57 (±0.01)	0.57 (±0.01)		0.5635 (±0.06)	0.5736 (±0.05)	0.5378 (±0.04)	
Goat milk production (kg)	8,466 (±8,374)	17,928 (±9,588)	15,090 (±9,888)	75,959 (±98,964)	25,803 (±15,863)	26,775 (±30,440)	63,405 (± 89,268)
Own land (ha)	8 (±4)	10.6 (±7)	10.2 (±6.6)	30.1 (±29.5)	16.5 (±16.7)	49 –	29.2 (±29.6)
Farmer Characteristics							
Age (years)	51.0 (±9.7)	52.0 (±10.7)	51.9 (±10.4)	51.4 (±11.7)	45.6 (±13.2)	51.2 (±15.9)	50.0 (±12.2)
Primary education (%)	3.6	53.6	57.1	33.3	7.8	2.0	43.1
Successor (%)	–	18.2	18.2	20.4	8.7	1.9	32
Training programs (%)	7.1	42.9	50	22.7	6.2	2.1	30.9
Full-Time work (%)	14.3	78.6	92.9	60.6	20.2	4.8	86.5
Breeding experience >20 years (%)	14.3	71.4	85.7	46.2	14.4	3.8	65.4
Why choose-Heritage (%)	10.7	60.7	71.4	39.4†	9.6	2.9	51.9
Performance recording (%)	8.7	8.7	17.4	28.8†	8.7	–	37.5
Keep records (%)	15	50	65	40.8	12.6	2.9	59.2
Computer use (%)		12.5	12.5	12.6	–	–	12.6
Member of professional organizations (%)		6.2	6.2	5.8†	3.5	4.7	15.1
Engagement in a process for better value of the production down the chain (%)	13.3	80	93.3	29.3	5.1	3.0	38.4
Share of information (%)	13.3	80	93.3	39.4	13.1	6.1	60.6

† Chi-squared is significant.

and providing technical supervision to improve the sector. However, a written contract could express more formally the rights and obligations, and can be used to improve the communication between milk suppliers and industries. In the study, there are limited cases under written agreements.

Most of the Cyprus sheep and goat farmers selling their milk to the milk industry are not satisfied with the price (36 cases) they get, although the number of farmers that think the price is good is also quite high (20 cases). Farmers selling milk to small dairies are also quite dissatisfied with the price (13 cases). Most of the farmers in Ipeiros selling their milk to cooperative milk industry think the price for milk is quite satisfactory.

In Cyprus, most of the sheep and goat farmers selling their milk to the milk industry are getting paid by cheque (55 cases), just as farmers selling their milk to the small dairies (17 cases). The amount of farmers selling their milk to the milk industry and being paid on credit is also quite high (31 cases).This is a major problem for farmers facing serious liquidity problems. On the other hand, most of the farmers in Ipeiros selling milk to the cooperative milk industry are being paid in cash (13 cases).

The results on sheep and goat farmers with special skills and experiences, heritage, labour skills, agriculture knowledge, revealed that the social and human assets need improvement both for organizational and developmental problems. Farmers who use the milk industry channel believe that the significant constraints that are affecting the marketing efficiency were not only the transportation cost but also poor market infrastructure and low promotion for the sheep milk. For farmers using the small industries channel, the rational management of grazing lands, the low promotion of traditional breed products, the long distances to market and the poor market infrastructure are the statistical significant constraints affecting their efficiency. The third distribution channel, the cooperative milk industry faces significant constraints from changes in CAP, the long distances to markets and low infrastructures in slaughter houses (for meat selling). According to the sheep and goat farmers in Ipeiros region in Greece, the strategies that could be supported to strengthen the sector should focus on the improvement of the infrastructures in mountainous areas, on supporting other activities like agro-tourism and on developing market-oriented policies and to promote the extensive farming. In Cyprus, farmers prefer strategies referred to the improvement of farm infrastructure, the consumer awareness and the training of breeders.

IV – Conclusions

Greek and Cypriot sheep and goat farmers mainly prefer the milk industry (private or cooperative) and small dairies as distribution channels. Farmers mentioned that marketing channels are organized on a dyadic basis. The study also indicated that farmers need stronger forms of coordination between all the links in the value chain. Contracts could be used to improve the coordination, communication and give greater value both to milk suppliers and industries. Furthermore, according to farmers' opinion there is a need for market-oriented policy and a better promotion of local farming practices in order to satisfy the upward trend of demand for traditional and local products. The analysis suggested that it is critical to align better incentives among stakeholders in the chain and distribute added value to the sheep and goat milk products.

Acknowledgments

The DoMEsTIc project was financially supported by the ARIMNet project – Call 2011.

References

de Rancourt M., Fois N., Lavin M.P., Tchakerian E. and Vallerand F., 2006. Mediterranean sheep and goats production: an uncertain future. *Small Ruminant Research,* 62, p. 167-179.

Dubeuf J.-P., de Ruiz Morales F. and Castel Genis J.M., 2010. Initiatives and projects to promote the Mediterranean local cheeses and their relations to the development of livestock systems and activities. *Small Ruminant Research,* 93, p. 67-75.

Gaspar P., Escribano A.J., Mesias F.J., Escribano M. and Pulido A.F., 2011. Goat systems of Villuercas-Ibores area in SW Spain: Problems and perspectives of traditional farming systems. *Small Ruminant Research,* 97, p. 1-11.

Kopke E., Young J. and Kingwell R., 2008. The relative profitability and environmental impacts of different sheep systems in a Mediterranean environment. *Agricultural Systems,* 96(1-3), p. 85-94.

Nardone A., Zervas G. and Ronchi B., 2004. Sustainability of small ruminant organic systems of production. *Livestock Production Science,* 90, p. 27-39.

NLOGIT Version 5. Econometric Software, Inc.

Thornton P.K., 2010. Livestock production: recent trends, future prospects. *Phil. Trans. R. Soc. B*, 365, p. 2853-2867.

Tzouramani I., Casabianca F., Hadjipavlou G., Araba A. and Ligda C., 2013. Supply chain and market analysis, Report 4, Project: Mediterranean biodiversity as a tool for the sustainable development of the small ruminant sector: from traditional knowledge to innovation – Domestic, ARIMNet.