Sheep and Goat Farming in Greece: Implications and Challenges for the Sustainable Development of Less Favoured Areas

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Abstract
Sheep and goat farming is considered to be one of the most dynamic sectors of the rural economy in Greece, both in terms of employment and overall income. The aim of this paper is to review the levels of sustainability in the small ruminant production systems in two Less Favoured Areas of Greece (LFAs): (1) in the mountainous areas of Epirus, and (2) in the island of Lesvos. In this context, the characteristics of the production systems that have significant impact on the sustainable development of rural areas under study are underlined. The sustainability is examined by the ecological, social and economic points of view, supplemented with cultural and regional elements. The ultimate purpose is to conclude with the challenges for the future rural development in LFAs through the sustainable development of sheep and goat farming. Data is based on surveys undertaken by the SEE-ERA.NET PLUS ‘INDI_SHEEP TRADI_CHEESE’ Project and the ARIMNET ‘DoMEsTlc’ Project, still in process.

Keywords: Less Favoured Areas, rural development, sheep and goat farming, sustainability, SWOT analysis

1. Introduction
Sheep and goat farming is considered to be one of the most dynamic sectors of the rural economy in Greece, both in terms of employment and overall income. These systems contain elements that can be proved of high value under the new conditions, related with the need for the protection of the environment and biodiversity and with consumer demands on safe and quality products [1,2]. Majority (over 85%) of the sheep and goats flocks are being reared in mountainous and disadvantaged areas, called as Less Favoured Areas (LFAs) as defined in Dir.75/268/EEC., having an important economic, social and ecological role, and also contributing to the conservation of the environment [3]. The extensive production system is predominant, with 78% of the Greek sheep flocks and 90% of the goats flocks are being reared in low-input production systems. [3]. For the year 2005, it was estimated that 110.000 farming units with more than 10 animals each were operating, while the average size of a unit was 84 sheep and 99 goats [3]. On the other hand, under the current globalized economy, the term improvement in an agricultural system is related to the term sustainable and a sustainable agricultural system is one in which agricultural activities are economically, environmentally and socially sustainable. Indicators of sustainable development of a Livestock Production System must therefore address issues in all three areas and the interactions between them [4]. The aim of this paper is to review the levels of sustainability in the small ruminant production systems in two Less Favoured Areas of Greece (LFAs): (1) in the mountainous areas of Epirus, and (2) in the island
of Lesvos. In this context, the characteristics of the production systems that have significant impact on the sustainable development of rural areas under study are underlined. The sustainability is examined by the ecological, social and economic points of view, supplemented with cultural and regional elements. The ultimate purpose is to meet the challenges of the future rural development in LFAs through the sustainable development of sheep and goat farming.

2. Materials and methods

Data is based on surveys undertaken by the SEE-ERA.NET PLUS ‘INDI-SHEEP TRADI-CHEESE’ Project (www.indisheep-tradicheese.gr) and the ARIMNET ‘DoMEsTlc’ Project (www.arim-domestic.net), still in progress. The ‘INDI-SHEEP TRADI-CHEESE’ Project has been research project under the SEE-ERA.NET PLUS Call for Joint European Research Projects (under the topic AgroFood, subtopic “Preservation of indigenous species and traditional food products”). The Project aimed to support the local producers in Balkan countries making safe and certified traditional cheeses from indigenous-sheep-breeds milk. Four sheep breeds or breed strains, indigenous in the Balkans and four traditional cheeses usually produced from the milk of these breeds have been studied, in Greece, Lesvos sheep breed and Ladotyri Mytilinis. The DoMEsTlc Project -still in progress- funded under EU FP7 ARIMNet, aims to enhance our knowledge on pastoral and rangeland sheep and goats production systems. Case studies from Greece, Cyprus, France and Morocco are analysed through field surveys, focussing in livestock farming systems, the genetic management of the breeds, and economical aspects. In Greece, the field work is carried out in Epirus, an area with a significant sheep and goats farming sector that faces various challenges towards a sustainable future.

In both cases, data was first collected from the available literature. Then, surveys were conducted in Lesvos island and in Epirus to study the characteristics of the productive systems. The collection of data was made by personal interviews and discussion groups with randomly selected farmers, based on a structured questionnaire.

Moreover, a SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) was applied as a valuable adjunct to experimental research for it helps to organize the information and analyze the representation of physical processes [4].

3. Results and discussion

3.1. Lesvos island

Results derived from the survey in Lesvos island are presented below [5,6]: Lesvos breed, a fat tailed, mixed-wool type sheep breed, has been produced on the Greek island of Lesvos, probably by crossbreeding local sheep with Chios-breed or fat tailed sheep from Asia Minor. It is reared mainly on Lesvos and Limnos islands, but also in other regions of Greece, both in the mainland and the Aegean islands, usually in extensively bred flocks. It is well adapted to the local climate conditions and the poor mountains pastures.

Almost 80% of the sheep are kept in the northwestern part of the island in flocks of 100-150 animals. Most of the sheds are simply structured, called ‘madria’, in a 5-10 km distance from the nearest urban area. Sheep are grazing in mountainous pastures or under the olive trees while concentrated feeds are provided in most flocks all over the year. The total purebred sheep population amounts to about 300,000 animals. It is a medium sized breed, having an average body weight of 50.0 kg (ewes) to 66.9 kg (rams) and an average withers height of 60 (55-65) cm (ewes) to 65 (60-70) cm (rams). Colouring varies greatly; Lesvos sheep are either black or red-brown or white with small or big (black, brown or reddish) spots around the eyes, the ears and the nose and on the legs. Most rams and some ewes are horned. Ewe-lambs can be first bred at the age of 9-10 months. Prolificacy is 1.10 - 1.25 lambs/ewe. The lambs are usually weaned at 45-50 days. The average tradable milk yield of controlled flocks (16,698 ewes) is 175 kg (in 185 days), but there are flocks with an average milk yield of 200-280 kg / ewe / milking period.

About 80% of the milk produced is used for cheese making (Ladotyri Mytilinis, PDO, Kasseri Mytilinis PDO, Graviera Mytilinis, Feta PDO). During the project implementation, a field trial was carried out under local conditions on the island of Lesvos with both raw and pasteurized milk to investigate and compare the
microbiological and chemical parameters of cheese and to evaluate the role of olive oil which is used for covering the cheese. Three different cheese-makings were performed, in summer, winter and spring using traditional technology. Quality of raw milk was very good to excellent. Pathogens (Salmonella spp., Listeria monocytogenes, Escherichia coli O157:H7 or Campylobacter spp) were not isolated in any of the examined milk or the cheese samples during cheese making or ripening. “Ladotyri Mytilinis” made with raw milk was as safe as the one produced with pasteurized milk and olive oil acted as a good preservative which prolongs the life of the product. In conclusion, the findings of this work dictate the need for healthy dairy sheep, for good hygiene practice during milking, for strict hygienic conditions in cheese production chain and for respecting the long periods of ripening; when these conditions are met, a safe and high quality unique traditional cheese is actually produced [7]. It was confirmed that the major threats for Lesvos-sheep breeding are: high cost of feed staff (high transportation costs of feed staff imported to the island), low level of modernization i.e. milking animals with hands, overgrazing of the pastures difficulties to access the market (lack of infrastructures) and lack of information and training strategy. On the other hand, Lesvos breed has a high resistance against parasitic and infectious diseases, while the unique flora in pastures and the traditional knowledge of the farmers result in high quality dairy products.

3.2. Epirus
Preliminary results of the Project are as following [1]: The production system is a semi-extensive one and is based on the exploitation of local natural resources. It is characterised by small size farms with an excessive fragmentation, ageing of the active rural population, degradation of communal pastures and a high proportion of leased arable and pasture lands. The sheep population presents high variation in morphology and production characteristics and shows excellent adaptability to the local environment [8-11]. The animals belong to dual-purpose breeds (milk and meat). Milk production is the main source of income for sheep and goat farmers. The 75% of the milk production is directed to the principal dairy industry of the region DODONI (a cooperative until November 2012), while other small dairies receive smaller quantities. Milk is transformed to feta (PDO), kefalagoraviera (PDO), galotyri (PDO), other cheeses and yoghurt. Very few farmers produce dairy products on farm for direct selling, however all farmers produce cheese, yoghurt and other products for self consumption. Regarding meat production, two main channels are described; the majority of the production is directed to the market through the wholesaler, while the remaining is sold directly to the consumer, or is self consummated. The percentages can vary between the farmers. The prices are unified in the region, formed by few actors. Although farmers have a high appreciation of their products, in most of the cases (only few exceptions) they do not have special agreements which differentiate the prices according to the quality, neither for meat or milk products. In general the farmers are willing to be engaged in a process that will allow them to sell their products at a higher price. There are some initiatives towards this direction, mainly for meat production.

The analysis of data demonstrated that the main weaknesses of the sector, are considered the age of farmers and the lack of successors, the lack of commercialization strategies, certification and labeling and the lack of rational organization of community pastures. In general, the farmers are willing to be engaged in a process that will allow them to sell their products at a higher price. The main strategy that all agree towards the sustainability of the sector, is the need to implement policies to improve the infrastructures in the mountain areas and to take support measures for low input farming systems. As bio-
physical constraints, it was demonstrated that these LFAs of Epirus include lands that have low agricultural potential because of limited and uncertain rainfall, poor soils, steep slopes or other biophysical constraints. Moreover, these areas often have an absolute disadvantage in producing many types of crops. Low agricultural productivity and land degradation are severe in these areas. Cereal yields of less than one metric ton per hectare are common, and deforestation, overgrazing, soil erosion, and soil nutrient depletion are widespread.

4. Conclusions

As a general conclusion derived from both surveys is that the development of the farming system would be based on the necessity of more rational exploitation of local natural resources - including off farm activities - in the framework of sustainability on the one hand and of the guarantee of a reasonable standard of life to the area's rural population on the other.

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References