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Organic and conventional dairy goat production systems in Andalusian mountainous areas

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Abstract. Organic goat production is poorly developed in Spain. Conventional dairy goat production systems located in Andalusian mountainous areas greatly depend on pasturing which implies that its transformation to organic model is not difficult. The objective of this paper is to evaluate the viability of organic dairy goat farms –as compared to conventional–, and to study the possibilities of transitioning from conventional to organic goat production. This study was carried out in 2006 in *Sierra de Cádiz* (Andalusia) with the autochthonous breed *Payoya*. To monitor technico-economic aspects of goat farms, FAO-CIHEAM method was implemented. Results indicate that organic farms are economically viable, due mainly to low costs of external feeds and income from European Union subsidies. For transitioning from conventional to organic dairy goat production a reduction of consumption of concentrates per animal and per year and/or cultivate grain on the farm are necessary.

Keywords. Indicators – Organic goat production – Viability.

Systèmes de production conventionnels et biologiques de caprins laitiers dans les zones de montagne de l'Andalousie

Résumé. La production caprine biologique est encore peu développée en Espagne. Les systèmes caprins laitiers dans les zones de montagne de l'Andalousie disposent de grandes surfaces pour le pâturage, et, par conséquent, il est assez facile de transformer ces systèmes en systèmes biologiques. L'objectif de ce travail est d'évaluer la viabilité des systèmes caprins biologiques par rapport aux systèmes caprins conventionnels et d'étudier les possibilités de conversion des systèmes conventionnels en systèmes biologiques. L'étude a été réalisée en 2006 dans la Sierra de Cádiz (Andalousie) avec une race autochtone (*Payoya*). On a utilisé la méthodologie FAO-CIHEAM pour le suivi technico-économique des exploitations caprines. Les résultats montrent que les systèmes biologiques sont économiquement viables compte tenu surtout des moindres coûts alimentaires par rapport aux systèmes conventionnels et des aides de l'Union Européenne. Pour réussir la transformation des systèmes laitiers caprins conventionnels en systèmes biologiques, il faut réduire l'apport de concentrés et essayer de les produire dans l'exploitation.

Mots-clés. Indicateurs – Production caprine biologique – Caprin – Viabilité.

I – Introduction

According to the European Union Directives (1991 and 1999), organic animal production should meet the following requirements: (i) synthetic chemicals or genetically modified organisms are forbidden; (ii) systematically using of conventional medicines is not allow; (iii) animal welfare should be guaranteed; and (iv) healthy and safe food must be produced.

Andalusia is the first Spanish region in organic production. There are 3053 organic farms in Spain, of which 1732 are located in Andalusia. Meat oriented sheep and cow farms have increased highly in the last years, representing the 24 y 45%, respectively, of the total organic

farms in Spain. However, goat farms represent only the 6% of the organic ones (134 meat oriented farms, and 34 dairy farms). There is a similar proportion in Andalucía: 64 meat and 10 dairy goat farms (MAPA, 2007).

In Andalusian mountainous areas, a high percentage of goat farms make much use of pasturing which partially ensures the compliance with the cited rules. However, milk produced in these mountain systems is not highly valued by the cheese industry. If farmers adopt the rules of organic production and obtain the certification of this kind of production, they can improve their production system and, on the other hand, their products could obtain greater value in the organic market and farmers could receive a better price from such products. This could partially stop the tendency toward rapid intensification of dairy goat systems that actually exist (Rancourt *et al.*, 2006).

The objective of this study was to evaluate the comparative technical and economical viability of organic and conventional Andalusian mountains dairy goat farms and to analyze the transition from conventional to organic goat production.

II – Methodology

Farms have been selected in collaboration with "Payoya" Breed Associations. In order to obtain data, thirteen dairy goat farms located in the *Sierra de Cadiz*, western Andalusia in southern Spain, were monitored throughout 2006. Only four of these farms are certified as organic.

The method of FAO-CIHEAM Observatory for technico-economic monitoring sheep and goat production systems has been used (Toussaint, 2002). This method has been adapted for the Andalusian grazing systems by the University of Seville researchers (Mena *et al.*, 2006). For the statistical analysis (Student's T Test), SPSS v.14 (2005) software was used.

III – Results and discussion

Table 1 show the principal technical and economic results obtained in this study. For conventional dairy goat systems with Payoya breed, the number of goats, the concentrate consumed per goat, the milk sold per goat, the feed cost and the milk income are higher than in organic ones. However, the net energy obtained from grazing is highest in organic farms, which shows a better use of natural pasture and a reduced dependence on concentrated in this type of farms. Since concentrated foods are generally purchased from companies or cooperatives, lower consumption of these involves a lower cost of food. The forage supply is similar in the conventional and organic specialised milk goat farms.

With sufficient natural vegetation and an adequate carrying capacity that minimize dependence on external food, organic goat farms in Andalusian mountain areas are viable from a technical point of view. Although differences are not significant, organic farms receive more subsidies than conventional ones, which is necessary to achieve an acceptable gross margin per worker.

According to the results, conventional Andalusian mountain goat systems are close to organic ones in relation to the requirements of the European Union Directives (1991 and 1999). In this sense, conventional systems are characterized by a large land surface per animal, few sanitary problems, and grazing as an integral part of animal feeding. The main problem for transitioning from conventional to organic dairy goat production is the dependency of concentrated purchased because of the shortage and the high cost of organic grain. Conventional farmers that wish to transit to organics farming must reduce consumption of concentrates per animal per year and/or cultivate their own grain on the farm. The latter is not always possible in the mountains areas which are located this farms.

To promote the direct marketing channels is also necessary for reach successfully this transitioning. This could allow that the farmer receive a highest price for the products and to reduce dependence of financial aids.

IV – Conclusions

Organic dairy goat farms in mountain areas are economically viable, if the use of concentrated is low, and they receive some income from subsidies.

Table 1. Technical-economic indicators (mean \pm standard error) for conventional (C) and organic (O) farms, 2006

| | Payoya breed | | |
|---|--------------|------------------|------------------|
| | P | C | O |
| No. of farms | | 9 | 4 |
| Total area per goat (ha) | NS | 0.82 \pm 0.15 | 0.81 \pm 0.26 |
| Total labour (WUY [†] /100 goats) | NS | 0.66 \pm 0.08 | 0.80 \pm 0.10 |
| Number of goats | * | 402 \pm 57 | 132 \pm 36 |
| Fertility | NS | 0.81 \pm 0.04 | 0.71 \pm 0.10 |
| Goat mortality (%) | NS | 4.44 \pm 0.58 | 4.25 \pm 3.71 |
| Concentrate consumed ^{††} (kg/goat/year) | *** | 289.7 \pm 24.5 | 61.2 \pm 42.8 |
| Forage consumed ^{††} (kg/goat/year) | NS | 29.7 \pm 14.0 | 32.6 \pm 27.3 |
| Net energy obtained from grazing ^{†††} (%) | ** | 57.5 \pm 3.5 | 88.7 \pm 9.1 |
| Milk sold per goat (l/goat/year) | ** | 374.5 \pm 15.1 | 222.0 \pm 47.1 |
| Kids sold/goat/year | | 1.11 \pm 0.07 | 0.99 \pm 0.16 |
| Feed costs (€/goat/year) | *** | 66.5 \pm 6.1 | 15.0 \pm 12.4 |
| Milk income (€/goat/year) | * | 170.4 \pm 7.2 | 114.8 \pm 29.4 |
| Meat income (€/goat/year) | NS | 42.7 \pm 3.29 | 35.0 \pm 10.96 |
| Subsidies income (€/goat/year) | NS | 30.8 \pm 7.1 | 101.9 \pm 41.8 |
| Gross margin per goat (€/year) | NS | 166.1 \pm 7.5 | 205.1 \pm 34.6 |
| Gross margin per WUY (€) | NS | 30820 \pm 6274 | 26016 \pm 3547 |

[†]WUY = Work unit per year.

^{††}Concentrate or forage consumed by all animals in the farm per year.

^{†††}Calculated based on the difference between estimated energy requirements and energy provided indoors.

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

According to the requirements of the European Union Directives (1991 and 1999), Andalusian mountain goat systems are close to organic ones. In this sense farmers wishing to transit to organics model must reduce concentrate supply and/or cultivate their own grain on the farm. Also it is necessary to promote the direct marketing channels, so that the farmer can receive a high price for the products and to reduce dependence on subsidies.

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