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Production system of Palmero PDO cheese

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Abstract. The objective of this paper, included in DOQUECAN project, is the analysis of Palmero Protected Designation of Origin (PDO) systems making a special point on cheese making and commercialization. The study was performed on all farms (19) included in Palmero PDO. A questionnaire was compiled with the aim of examining some of the structural and management aspects of the farms as well as cheese making process and commercialization of Palmero cheeses. The average flock size was 166 heads of Palmero goats. The production system could be considered as semiextensive (80%). Animal feeding is mostly based on the utilization of autochthonous and endemic pastoral resources. Cheeses were ripening till 15-20 days old and then were commercialized by intermediaries (63%). Nearly 80% of the producers smoked their cheeses by traditional methods. This singular process gives special sensorial characteristics.

Keywords. Dairy goats – Production system – Cheese making – Labelled products.

Système de production du fromage AOC Palmero

Résumé. L'objectif de cette communication, dans le cadre du projet DOQUECAN, est d'étudier les systèmes de production de l'Appellation d'Origine Contrôlée (AOC) Palmero en accordant une attention particulière à la fabrication et à la commercialisation du fromage. Toutes les exploitations étudiées (19) font partie de l'AOC Palmero. Un questionnaire a permis d'examiner plusieurs aspects concernant la gestion et la structure des exploitations, ainsi que le processus de fabrication et de commercialisation du fromage Palmero. Les troupeaux ont une taille moyenne de 166 chèvres Palmero. Le système de production peut être considéré semi-extensif (80%). L'alimentation animale est basée sur le pâturage sur des ressources pastorales autochtones et endémiques. Les fromages sont affinés pendant 15-20 jours, puis commercialisés par des agents intermédiaires (63%). Près de 80% des producteurs fument leurs fromages avec des méthodes traditionnelles. Ce processus donne des caractéristiques sensorielles particulières.

Mots-clés. Chèvres laitières – Systèmes de production – Fabrication du fromage – Produits sous signe officiel de qualité.

I – Introduction

Nowadays, there is a great deal of interest in the definition of quality, especially with regard to the PDO cheeses. Palmero cheese is a typical product of La Palma (Canary Islands, Spain) and it is manufactured from raw goat milk of Palmera breed according to the specifications of its Denomination of Origin Regulatory Board (UE 1241/2002). It is an uncooked, pressed cheese, ripened at different periods.

The subject of this paper is to analyze all factors involved in Palmero cheese production and it is included in Canary Government project DOQUECAN, related to Canarian goat cheeses with PDO.

II – Material and methods

The study was performed on all farms (19) included in Palmero PDO cheese. A questionnaire was compiled with the aim of examining some of the structural and management aspects of the

farms as well as cheese making process and commercialization of Palmero cheeses. Surveys were carried out along 2007 by the technicians of the PDO Regulatory Council and following the methodology used in earlier studies (Darmanin *et al.*, 1992). The questionnaire included information about milk producing animals, farm management systems, a detailed description of the cheese making, smoking, ripening process and commercialisation process. The questionnaire is structured in a total of 12 information blocks, from which 81 variables were taken.

III – Results and discussion

Among the farms that are included in Palmero PDO, 40% were located in humid and sub-humid areas while 60% were located in semiarid areas. All the farms were classified as cheese producers. None were just milk producers. Every farm had Palmera goat breed as milk producer for Palmero PDO cheese making although other species of animals (pigs, horses and sheeps) were also being raised with the goats. The average flock size was 166 head of Palmero goat (126 dairy goats) with a usual variation between farms (51-256). Usually, each flock has 1 or 2 males.

Regarding the feeding regime, the production system could be considerate as semiextensive. According to Escuder *et al.* (2006) animal feeding is mostly based on the utilization of autochthonous and endemic pastoral resources. Eighty percent of the farms grazed their flocks but five of them used an area per goat very small (<0.2 ha per goat). The richer pastures are in the north and northeast of the island. The goats are commonly fed by shrubs as *Chamaecytisus proliferus*, *Bituminaria bituminosa*, *Erica arborea* and *Myrica falla* in humid areas and *Rumex lunaria*, *Opuntia ficus indica*, *Periploca laevigata* in arid and semiarid zones. Besides some flocks are grazed near forests so they used *Pinus canariensis* and *Spartocytisus supranubius* as feeding resources. Occasionally, in dry seasons, alfalfa, oats and cereal straw are used instead of natural resources. All the farms provided the goats with supplementary feeding during all the year. Maize, barley, soya, mixture seeds and concentrate are commonly used as the energetic part of the diet.

The veterinary service (including animal vaccination programme), management farm production sources, feeding and reproduction strategies are carried out by Sanitary Defence Associations with private found and state support. In all the farms surveyed, the mechanical equipments and milking routine could be considerate as satisfactory.

Palmero PDO cheese regulation allows the possible addition of artisan goat's kid rennet or commercial rennet. For generations, cheese makers from La Palma have utilized kid's rennet paste preparations for curdling goat milk, which seems to be an essential element for the development of the typical taste and texture of Palmero cheese (Fresno *et al.*, 2006). Nevertheless, cheese makers find some difficulties in its use: the complexity and variability of composition, depending on source (individual and age factors) and extraction mode, in addition difficulties to control the microbiological quality are the main disadvantages associated with these traditional rennet pastes. In addition, difficulty in the standardisation of both milk-clotting and lipase activities could represent a limitation in their use. Due to all these reasons, some manufacturers of Palmero cheese have gradually introduced commercial animal's rennets (powder) and microbial rennets, mainly those that have a mix of pepsin and chymosin; survey results shows these practices are decreasing: actually only 40% of the farmers use natural pastes compared with 93.6% in 2001 (Fresno *et al.*, 2002) or nearly 100% in 1991 (Darmanin *et al.*, 1992). The goat's kids are slaughtered at 10-15 days form birth, the stomachs stayed in solid salt for one or two weeks and then the abomasums are kept on dry and shadow places protected again insects during one year. To prepare the rennet pastes, stomachs skin is removed and all abomasums content and mucus membrane are mixed with salt and mineral water, grinded and filtered. This solution of rennet already reconstituted remains for one or two months in refrigerated conditions.

All the farms transformed the milk directly into Palmero cheese. Cheeses are made according to the specifications of the Palmero Cheese Denomination of Origin Regulatory Board. The cheeses are always made on the same day just after milking. Milk is not pasteurized and starter culture is added in all the farms except one. Rennet is added to obtain clotting within 35-45 min. After coagulation, all curds are cut with a metal or wood stick or with a lyre to obtain small pieces less than grains of millet. The pressings are usually by hand although 20% of the cheese maker's uses pneumatic presses. Afterward, salting is achieved by rubbing dry salt onto one surface of the cheese for 12-24 hours and then turns upside round and rubs the other side. Salting the cheeses by brine is not used at all.

Nearly 80% of the producers smoked their cheeses by traditional methods. In La Palma Island the smoking of the cheeses has been a traditional way to preserve them, at least since the XV century when the Archipelago joined the Spanish Crown. Smoking is one of the oldest ways to preserve food, but modern techniques of the food industry have relegated to a second place. These days, the main objective of the smoking process is to give to the food certain characteristics of colour, odour and flavour. The smoking process for Palmero PDO cheeses uses four different materials: shell of the almond (*Prunus dulcis*), segmented prickly pear cactus (*Opuntia ficus indica*), pine needles and wood of canary pine (*Pinus canariensis*), that generate four distinct categories of smoked cheese. Pine needle is the most used material (64%) followed by shell of almond (21%). This process takes place using different types of smoking chambers (used by 90% of the cheese producers) in opposite to the importance of traditional metallic drums in previous studies (Fresno *et al.*, 2002; Fresno *et al.*, 2005). The smoking time varied between 10 and 20 minutes by side, and the distance between the cheese and the fire was 50-100 cm.

Cheeses were sold from business to business in 60% of sales made by the producer, with distributors being in charge of marketing from there onwards; there is little evidence of aggressive marketing of the PDO brand at present by the intermediaries, with most being done by word of mouth. Only 10% of the cheese was sold directly to the consumer, again with marketing usually being done by personal recommendation. 26% of the cheese factories used a combination of both methods of commercialization. Table 1 shows some commercial aspects: size of cheeses and average price of cheese in farms.

Table 1. Characteristics and prices of Palmero PDO cheeses

Cheese characteristics		Type of cheese	Average Price (€)
Weight	0.5-15 kg	Fresh	6.62
Height	6-15 cm	Semi-hard	9.12
Diameter	12-60 cm	Hard	10.9

Source: experimental data

IV – Conclusion

All Palmero PDO cheeses are made with raw milk. It is a quality product linked to the territory where it is produced and animal feeding is based on autochthonous and endemic pastoral resources. Cheese making practices are very traditional. However, some changes have been observed recently to adapt to the sanitary regulation, as refrigeration for fresh cheeses and a gradually change of traditional rennet to commercial rennet and starters.

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