

The production and processing of sheep's milk in Portugal : Serra da Estrela cheese

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Summary

General information is given on the production of sheep's milk in Portugal and mention is made of the major kinds of cheese produced from it. Serra da Estrela cheese is presented as an example, describing its production process, general characteristics and economic value. The importance of quality for the modern consumer is stressed as well as the urgent need for efficient measures to promote such cheese in the right markets.

Résumé

□ **Titre : La production et la transformation de lait de brebis au Portugal : la Serra da Estrela**

Des informations générales sont données sur la production de lait de brebis au Portugal et les fromages obtenus. La Serra da Estrela est citée comme exemple, avec une description du processus de fabrication, les grandes caractéristiques et la valeur économique. L'importance de la qualité pour le nouveau consommateur est soulignée ainsi que l'urgente nécessité de mesures efficaces afin de promouvoir ces types de fromages sur les marchés adéquats.

I. - Introduction

Portugal has a tradition of raising sheep, which have always been used for producing meat, milk and wool.

The climatic differences between the north and the south of the country are responsible for the considerable differences in the type of agriculture, the system of livestock breeding, and the number of animals per herd.

Sheep and goats predominate in the interior areas and bovine species, particularly dairy cows are more common near the coast.

Portugal has several breeds of sheep that are used according to their suitability for different purposes. Depending on the characteristics of the wool that they produce, they are grouped into Merino, Bordaleira and Churra breeds. Most of these breeds are bred simultaneously for meat and/or milk production. Their distribution by the seven different "Direcções Regionais de Agricultura" is shown in **table 1**.

In relation to milk production, the most important breed is Bordaleira from Serra da Estrela. Production ranges from 120 to 180 litres of milk with a lactation period of 150 to 200 days. Production levels of 500 l have been reached, however, which shows the great potential of this breed to increase its production when well selected.

Merino sheep represent more than 50 % of the total number of sheep in Portugal (3,187,000) and their milk production is around 20 % of total production (82,574,000 l.).

Sheep's milk in Portugal is used only for cheese production and it can be processed into cheese by farmers, by small family businesses or by the dairy industry. In general, in the northern part of the country the great majority of farmers process their milk into cheese. In the southern part, only about 25% do so as most of them (70 %) sell their milk to cheese producers traditionally called "rupeiros".

The production, transportation and commercialization of sheep's milk is very inefficient and unfortunately has not yet been subjected to any type of official control.

An example of the composition of milk is given in **table 2**.

For industrial purposes, milk is generally collected every other day and it is a well known practice to add H₂O₂ to preserve the milk.

The tradition of making cheese from sheep's milk seems to have deep roots in the past and it is thought that the difficulty in finding natural pasture during the autumn and winter in Serra da Estrela (also called Montes Herminios by the Romans) resulted in a migratory pattern and sometimes even the settling of shepherds in other regions where they revealed the "secret" of their cheesemaking.

There are four types of sheep's milk cheese using the same main technology which have gradually been adapted to local conditions. These are Serra de Estrela, Serpa, Azeitao and Castelo Branco which have now their own production boundaries (*Regional Decree Nos. 42/85; 39/87; 49/86 and 22/88*) although the system of Controlled Quality has not yet been implemented. Niza and Evora are two other types of cheese, although they are less important and rather different from the first ones.

II. - Serra da estrela cheese

Serra da Estrela, the highest mountain (2,000 m) in Portugal, has a very beautiful and contrasting scenery.

Serra da Estrela cheese is made from ewe's milk by farmers using fresh milk and Cardo (*Cynara cardunculus*) as a rennet. This wild flower grows in many regions of Portugal and it is generally sold at local markets.

There are a number of variants in the home dairy production of this cheese although there are certain operations common to all producers.

The milk comes from their own herd and the interval between milking and the start of cheesemaking is between 30 to 60 minutes. The milk frequently reaches the place where the cheese is going to be made while it is still warm. At this stage, hygiene is of great importance.

Once the milk has been brought to the farmhouse it is strained through a fine cloth and poured into a 10 to 20 litre churn which is then placed close to the fire to achieve the right temperature (27-29°) for coagulation. The milk is then curdled with the Cardo rennet and the curd is ready to be worked after one hour. The work of turning the curd into cheese is done inside an open type mould which is placed on a pressing table. Once the cheese is drained the diameter of the mould is reduced until the desired size is reached. This work is done through very slow hand pressing that can take about two hours. The cheese is then removed from the mould and rubbed with salt, after which a band of fine cloth is wound round and tied with a knot.

On the following day, the cheese is placed in a cupboard where it is protected from draughts and kept in a damp atmosphere which is almost at saturation point (95%). Cheeses are always kept at room temperature, which is very low (6-8°). Lower temperatures do not harm the quality of the cheese but slow down the ripening process. Such low temperatures are attained naturally in the Serra da Estrela region which has long periods of snow in the winter. The best period for cheesemaking is between December and

April. There are two types of Serra da Estrela cheese: the "butter-textured" (*Amaanteigado*) and the "old" (*Velho*).

The normal ripening period is 30 to 45 days for Amanteigado and Velho cheese should ripen for at least six months. Genuine, good quality Serra da Estrela cheese comes in the form of a flattened cylinder with a diameter of 15-20 cm and a height of 4-6 cm. It weighs between 1-1.7 kg and has a minimum ripening period of 30 days. It is a smooth, soft bodied cheese with a strong aroma and pleasant flavour without bitterness and is slightly acid. The colour is ivory or pale yellow and there are a few gas holes.

Serra da Estrela is produced mainly in Oliveira do Hospital, Manteigas, Celorico da Beira, Gouveia, Seia and Guarda. Most of the villages where the cheese is produced are part of the Serra da Estrela Natural Park, although there are some other places not included in the park which also produce it.

The boundaries of the Serra da Estrela cheese production region were established by *Decree No. 42/85* in 1985 and there is also a Portuguese standard for this cheese (*NP- 1922*). The cheese is still marketed without any packaging or labelling to protect its regional origin and quality, which obviously encourages adulteration of the product and speculation. An example of the composition of "Excellent" and "Good" cheeses is given in **table 3**.

The quality evaluation of the best cheese presented at the regional fairs and exhibitions over eight years (1979-1988) shows that the quality has been declining a great deal. In 1979 the Quality Approval could be given to 58 % of the cheeses evaluated. This percentage dropped to 17 % in 1988. Excellent cheese almost became a rarity and the number of average cheeses increased. Milk from other species was detected more often and the general quality was poorer (see **table 1** and **graphic 1**).

The biggest cheese fairs are in Celorica da Beira and Fornos de Algodres and are held twice a month on different days. There are already dairy factories producing ewe's milk which generally does not have the true characteristics of genuine cheese. Most of this cheese is sold under the name of Serra-type cheese. The economic importance of Serra da Estrela cheese has been recognized for Portugal. Precise statistics are still difficult to obtain but it is estimated that this cheese production totals about 2,500 t which, with an average price of 80 FF per kg, gives a total value of about 200 million FF. If we consider the national total production of sheep's milk cheese, even taking into account the price variation according to the various types and regions, a value of 680 million FF can be reached. This surely plays an important role in the national food economy and must be a source of wealth for rural populations.

III. - Conclusions

The expansion of sheep's milk consumption will depend on major production, technological and commercial improvements. Quality is the dominant word today in Europe. Both industrial and traditional farm product have to comply with very strict rules of hygiene and quality.

The consumer is increasingly demanding so it is difficult to conquer specialized sectors of the market without high quality products.

I believe that our traditional cheeses have their own place. However, it is necessary to work very hard and quickly in Portugal to improve scientific knowledge on these cheeses and to set up an efficient system of control and aggressive marketing to promote the product in its right place as a traditional quality cheese with a regional label for "*connaisseurs*" and people who like to eat and know how to eat.

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Graphic 1

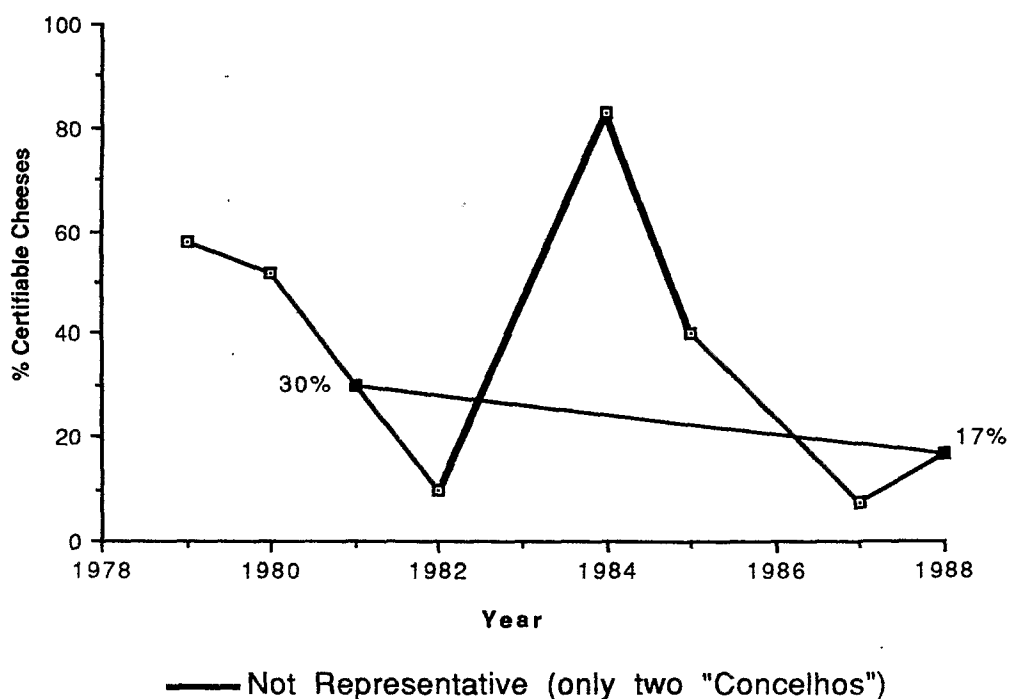


Table 1 : Sheep distribution

"Direcções Regionais Agricultura" 1988	Total Sheep (10 ³)	Ewes (10 ³)	%
Entre Douro e Minho	162	110	5.5
Trás-os-Montes	260	183	8.5
Beira Litoral	209	144	6.5
Beira Interior <i>Serra da Estrela</i>	435 120	331 90	13.5 4
Ribatejo e Oeste	447	308	14
Alentejo	1 589	1 036	50
Algarve	70	43	2
TOTAL	3 187	2 167	100

Source : INE, Estatísticas Agrícolas, 1988.

Table 2 : Chemical composition of ewe milk

Date	Origin	Numb. of Samples	pH	Acidity °D	Fat (%)	Protein (%)	Lactose (%)	Total Ash (%)	Dry Matter (%)	CI (%)
72/73 1981	Loures	10	6,4	25,5	8,2	6,0	4,3	0,90	19,7	0,23
1973	Guarda	12	---	27,1	8,2	6,3	5,0	0,97	20,7	0,26
1974 1975 1976	Azeitão	79	6,5	25,9	6,6	6,0	5,1	0,91	---	---
MEAN		101	6,5	25,9	7,2	6,0	4,9	0,93	20,2	0,25

Table 3 : Chemical composition of good "Serra da Estrela" cheese

Numb. of Samples		103
Weight (Kg)		1,240 ---- 1,400
pH		4,9 ---- 5,3
Acidity (% L.A.)		0,76 ---- 0,90
Moisture (%)		46,7 ---- 48,8
Dry Matter (%)		51,3 ---- 53,6
In Dry Matter	Fat (%)	54,3 ---- 57,3
	Cl (%)	4,2 ---- 4,8
	Total Ash (%)	7,9 ---- 8,1
	T.N. (%)	5,8 ---- 5,9
	S.N. (%)	2,5 ---- 2,6
	Total Protein (%)	37,5 ---- 38,1
Maturation Coefficient		43,0 ---- 47,6
CLASSIFICATION		17 ---- 19

Table 4 : Quality evaluation of "Serra da Estrela" cheese"

YEAR	NUMBER SAMPLES	CLASSIFICATION				MIXTURE OF MILK	QUALITY APPROVAL
		EXC.	GOOD	AVER.	BAD		
1979	24	10	12	2	-	8	14
		41%	50%	8%	-	33%	58%
1980	25	11	12	2	-	10	13
		44%	48%	8%	-	40%	52%
1981	20	1	18	1	-	13	6
		5%	90%	5%	-	65%	30%
1982*	10	3	6	1	-	9	1
		30%	60%	10%	-	90%	10%
1984*	6	3	3	-	-	1	5
		50%	50%	-	-	17%	83%
1985*	5	-	2	2	1	-	2
		-	40%	40%	20%	-	40%
1987**	40	2	20	12	6	19	3
		5%	50%	30%	15%	47,5%	7,5%
1988**	60	1	29	18	5	22	10
		1,7%	48%	30%	8,3	36,7%	17%

* Not Representative (only 2 "Concelhos")
 ** Enlarged Area by Law (8 "Concelhos")

Table 5

1988	NATIONAL PRODUCTION	SERRA DA ESTRELA
Milk (t)	82 574 000	12 960 000
Cheese (t)	14 500 (Fermière+Industrielle)	2500
Value	22x10 ⁹ Esc. 880x10 ⁶ FF	5x10 ⁹ Esc. 200x10 ⁶ FF