Is Merino Wool Disappearing in Portugal: The Merino Beira Baixa Case

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Summary

In Portugal, we are facing a fast decrease in the production of good quality wool. This situation can be seen from a qualitative and quantitative point of view by looking at the most extreme situation, which involves almost the extinction of a Merino breed – Merino Beira Baixa (MBB) – due to its inability to produce high milk quantities when subjected to the better handling of the more intensive productions systems.

The changes in the production systems and the need for higher milk production for the production of PDO cheese (Protected Designation of Origin – EEC Regulation 2081/92), but without indexation to the milk of the MBB sheep breed (as opposite to other cheeses made exclusively with milk from one specific breed), has led to the massive introduction of exotic sheep breeds specialising in milk production. In the last decade, the MBB animals have decreased by more than 90%, and urgent action is needed to prevent the disappearance of one more indigenous breed.

From the perspective of:

- Merino wool produced, it is possible to see a large quantitative decrease; the quality has decreased enormously, and nowadays is very difficult to find, in the breed, fine wool animals;
- the productive system, we should emphasise that it is still possible to find farms with extensive systems. However, the profitability of the traditional system based on the MBB is becoming minimal, and the system could disappear if attention is not given to its conservation; and
- environmental protection, the disappearance of traditional extensive systems and the reduction of biodiversity are worrying.

Introduction

In Portugal, there are two breeds from the Merino ethnic group: Merino Alentejo (varieties: White and Black) and Merino Beira Baixa (MBB). Those breeds are integrated in production systems that are not specifically for wool; however, they produced good quality wool but heterogeneous. The Merino breeds were traditionally used in extensive systems.

The region in which this study was conducted is characterised by a Mediterranean climate with 114.4 biologically dry days and a total rainfall of 700mm, a cold and wet winter, and a dry and warm summer. Fibrous feeds are available according to the Mediterranean pastures cycle; in normal years, from mid-May, annual pastures rapidly reach their vegetative cycle, and then become dry and strongly lignified. Pasture availability is qualitatively and quantitatively bad.

The MBB is very well adapted to the harsh conditions prevailing in the region; however, it has been losing importance with the tendency toward sheep production intensification and specialisation. In one decade, this breed is approaching extinction.

In a study done in 1938, it was possible to find quite a reasonable percentage of animals with fine wool (15 to 20μm), as much as 26% in some regions (Morais 1938).

In the 1970s, the main income of the traditional production system was, in order, meat, milk/cheese and wool. The historical analysis of wool concentration data shows, in some years, an incidence of fine wools still higher than 10% (AA Extra: 19 to 22μm), with wool AA (Extra and Fina: 19 to 23μm) higher than 60%.

During the 1980s, traditional systems have been kept, with an increase in the milk component and maintaining the MBB as the productive basis of milk production systems. Farm profitability has changed and is now, in order, milk/cheese, meat and wool. The loss in wool income was evident. In this period, MBB reached its highest figures with 180,000 animals. The maintenance of the extensive system and the almost exclusive utilisation of local fibrous feeds, without improvement of handling conditions, only allowed the production of this well-adapted breed.

Wool characteristics have been maintained, no genetic improvement was done, registering some crossing with imported breeds (Manchega and Frisian), with a higher potential for milk production; that has led to the appearance of crossed fleeces. These crosses not resulted, since animal needs were not satisfied by traditional handling.

During the last decade, an intensification of production systems has occurred. This evolution is more evident in the areas that have introduced intensive and irrigated cultures (industrial tomato, corn maize and tobacco). Tobacco culture was socio-economically relevant and has created locally higher capital investment in infrastructures, availability of mechanisation (more and bigger tractors and centre-pivot irrigators), and a higher entrepreneurship dynamic. The actual problem associated to this culture has led the producers to find new alternatives for production; and they are going to the milk sheep animals. The general management improvement was not followed by an increase in MBB milk production. This reinforced the need to find the most productive genetic basis, compatible with the available resources. That situation has led to the introduction of imported breeds specialising in milk production, crossed or pure, namely, the Awassi, Assaf, and Lacaune (with low wool quality).

Materials and Methods

An analysis of the historical data of one of the three places of wool concentration, or collection, in Portugal (Castelo Branco), where MBB wool is collected, has been done; emphasis was placed on analysis from 1988 to 1991 and from 1995 to 2002. [Ed. note: Since 1940, Portugal has had a system of centralised wool collection (via livestock co-operatives that also work as wool storage centres) and classification (via technicians from the Ministry of Agriculture), so that batches of wool can be grouped for sale to industrial concerns. See http:// www.macaulay.ac.uk/europeanfibre/effnnew2luis.htm for further information.]

At the wool concentration place, the fleeces are graded (by tactile and visual classification) by technicians from the Ministry of Agriculture in accordance with the Portuguese Official Classification (Pinto de Andrade and Várzea Rodrigues, 1997; Pinto de Andrade *et al.*1998), available on www.mluri.sari.ac.uk/europeanfibre/ effnnews4.pdf.

From 1999 to 2001, MBB wool has been characterised in the Animal Fibre Laboratory (temperature 20ºC ± 2ºC and humidity 65% ± 3%) at ESACB (School of Agriculture of Polytechnic Institute of Castelo Branco); samples have been taken randomly, in animals from ESACB (39°49'N, 7°29'W) and in animals from other farms in the region. The mid-side sample has been used (EFFN 1997); however, a larger area (around 10.0cm^2) is used. Wool yield (%) was characterised in accordance with AS/NZS 4492.2 (Int.):1997. For wool diameter (µm), the OFDA100 was used in accordance with IWTO 47-98, and samples were processed in a mini-core (Goodwin Laboratory & Testing Equipment). OFDA100 was also used for curvature (º/mm). Wool strength (N/Ktex) and length (cm) tests were performed on subsamples using Staple Breaker Model 1A (Agritest) and Staple Length Meter – Agritest (IWTO 93) respectively.

Results and Discussion

The quantity of classified wool produced in the region has decreased strongly due to higher quantities of crossed wool and not tied wool. In Table 1, we can see the evolution of classified/typified Merino wool versus crossed wool. The percentages have evolved from 96.42% versus 0.82% in 1995 to 28.55 versus 38.75% in 2001. The increase of the wool collected but not tied shows the lack of interest from the producer (Várzea Rodrigues and Pinto de Andrade 2001); already notorious by the end of the 1990s, but with a maximum of almost 33% in 2001. Due to the wool heterogeneity, only with the classification (done in tied wool) is it possible to identify homogeneous wool lots that are paid according to it. Wool tie implies an added cost in hand labour that is not rewarded in the final wool price.

Table 1. Percentage of classified, crossed and not tied wool in relation to the total collected wool.

Wool type	1995	1996	1997	1998	1999	2000	2001
Classified wool (%)	96.42	75.93	88.33	65.97	52.15	47.16	28.55
Crossed wool (%)	0.82	7.03	7.96	11.77	15.43	26.93	38.75
Not tied wool (%)	2.75	17.05	3.71	22.26	32.43	25.91	32.69

Wool quality has degrade continuously. In the 1980s, the percentage of AA wool was identical to the percentage of the remaining wool; in the nineties, those percentages diverged, and AA wool has decreased to a third of the

classified wool (Table 2). It is possible to verify that the percentage of AA wool has decrease more slowly than the percentage of classified wool. Those parameters are independent; however, we should mention that the MBB wool from more heterogeneous flocks and with lower percentages of AA wool is not valorised in auctions and tends to be concentrated not tied.

Table 2. Percentage of wool AA extra and fina versus others wool classes (classified wool).

Class	1988	1989	1990	1991	1995	1996	1997	1998	1999	2000	2001
Wool AA (%)	49.11	43.39	48.20	32.90	20.95	29.78	35.03	33.72	27.56	28.73	36.00
Others Classes (%)	50.89	56.61	51.80	67.10	79.05	70.22	64.97	66.28	72.44	71.27	64.00

Based on laboratory analysis is possible to see that the real situation of MBB is still worst. The average diameter is already 26.85µ (Table 3), only 5% of the animals have wool lesser than 22µm, and 82% have bad quality wool (> 25µm). Other wool-quality parameters from MBB are given in Table 3. MBB can not be considered to be a wool breed only. It has always been used on triple aptitude (meat/milk/wool first and then milk/meat/wool), and no genetic improvement was done. However, according to DGP (1987), in the 1940s MBB produced the finest wool within the ethnic group Merino.

Table 3. Main wool-quality parameters of MBB based on results from wool campaigns 1999 to 2001.

Parameters	n	Average	SD	Minimum	Maximum
Yield (%)	522	59.40	8.92	36.2	79.0
Diameter (µ)	535	26.85	2.14	20.2	33.8
Curvature (º/mm)	534	101.16	13.69	64.0	138.0
Staple strength (N/Ktex)	499	20.83	9.16	7.0	56.4
Staple length (mm)	506	68.93	11.45	40.0	110.0
Fleece weight (g)	517	2218.5	409.4	1200	3900

This situation, a decreasing of merino wool quality, does not affect only the MBB (Várzea Rodrigues *et al.* 2000). It is possible to see a tendency for a percentage decrease in National classified AA wool produced (44.4% in 1990 versus 29.0% in 1996 and 1997), which corresponds to an increase in the production of A, B and D wool (Pinto de Andrade and Várzea Rodrigues 1997; Pinto de Andrade *et al.* 1999a).

Wool prices at production reached their historical minimum values in 2001 (0.27 versus 0.41 euro/kg for wool sold directly from farmers and wool sold at the auctions respectively). The price of direct sell is the average price paid by buyers at the farm, regardless of wool quality. The value given for auctions represents the pondered mean of all wool lots.

Wool production represents a liability for the breeder, as the selling price does not cover the shearing expenses. The percentage of the wool gross income, related to all animal production gross income, at current prices, has decreased between 1994 and 1997 from 0.26% to 0.21% (Pinto de Andrade *et al.* 1999b) and has continued to suffer a devaluation.

Relative to the production systems, actually we verify the coexistence of the traditional system, based on the extensive use of endogenous resources, the intensive milk production system (with a lesser expression for meat), and within these two systems, different gradients of production systems. The traditional extensive system based on the MBB breed is almost extinct, involving only around 2,000 to 3,000 purebred ewes. This is equivalent to almost the disappearance of MBB animals.

From an environmental point of view, it should be noted that the new sheep breeds and the intensive systems (with the herds walking lesser areas or permanently confined) are associated with the abandonment of marginal areas.

Final Considerations

The intensification in the production systems was predictable and unavoidable, since the Portuguese integration in the European Union has created higher levels of competition. Some advantages have come from intensification, some apparent, others real, such as farming activities are still a reality and with people avoiding the human desertification risk; improvement of life and work conditions within the farm; the associativism has been reinforced and the owners of milk production owns also a major part of the agro-industrial cheese

processing; cheese is offered in the market throughout the year (apparent because it implies intensive systems and more productive breeds).

Some disadvantages are also detected. From the environmental sustainability of the systems, problems are arising such as abandonment of marginal areas and changes of greater or lesser extent in landscape; these problems could worsen with forestation using rapid-growth species tree; higher soil tillage; uncontrolled scrub growth, which is associated with an increase of fire risk; and, with or without fires, deep changes in landscape; all decreasing animal and vegetal biodiversity in the medium term. The abandonment of marginal areas could be positive if soil tillage is reduced; if scrub growth is controlled; if *Quercus* spp. trees are used; and if grazing sheep (preferably MBB) are used in extensive systems.

Another disadvantage could come from the incapacity to maintain the cheese production with the desired characteristics. Apparently. the cheese currently produced has suffered some changes, without arguing if for better or worse, of its organoleptic characteristics. This situation could result from several sources including reduction of the quantity of milk from the MBB, traditionally used in cheese making with PDO in the delimited area of Castelo Branco Cheese.

In relation to wool, we can detect a vicious circle in which wool has lost its economic interest in the system and in many farms is responsible for negative incomes, which leads the producer to ignore further the elementary rules of wool management from the production, shearing and concentration, and which can been seen in the percentage of merino wool delivered to the concentration centres not tied, 2.75% in 1995 to 32.69% in 2001.

The profitability of the traditional system based on the MBB is becoming minimal, and the system could disappear if attention is not given to its conservation. MBB is almost extinct, and urgent action is needed to prevent the disappearance of one more indigenous breed.

The small number of animals that produce fine wool (< 20μm), their distribution over a high number of farms, the introduction of other breeds for crossbreeding to improve milk production, the difficulties of the wool market, the losses of profit from this subsector, and the absence of objective policies could lead in a short time to the disappearance of this genetic basis, making irreversible the process of regression of the wool quality in the last years (Pinto de Andrade *et al.* 1999b).

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