

## COMPARISON OF THE FLEECE PRODUCTION OF TWO EXTENSIVE FRENCH SHEEP GENOTYPES

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**Abstract:** Sheep fleece became problematic Europe-wide for many reasons, including its very low price. From an animal welfare standpoint, the thick fleece may cause discomfort for the sheep as it can be a welcoming environment for parasites and may cause heat stress during hot summer days; therefore, annual shearing is necessary for most sheep genotypes. Physiologically, growing fleece and maintaining normal body temperature to decrease heat stress distract resources from producing valuable products such as meat. Thus, we aimed to compare the fleece production of two meat-type sheep genotypes from South-France, Berrichon du Cher (Berrichon) and Blanc du Massif Central (BMC), which have relatively little fleece production but thrive in the local Hungarian weather. Furthermore, we fill the gap by providing data on the fleece production of meat-type sheep in Hungary. A total of 180 sheep ewes were included in the data collection (N=99 Berrichon and N=81 BMC). Data was collected at the annual shearing by a digital scale measuring the weight of fleece originating from the back and shoulders. Student's t test determined the differences in fleece weight between genotypes. Significance was set at  $P < 0.05$ . The average fleece production of BMC ewes was 1.66 kg, which was significantly ( $P = 0.0001$ ) less than that of Berrichon ewes (2.14 kg). Based on the results, further study is needed to study the performance of BMC ewes with little fleece and their lambs' in order to improve performance indices and increase profit.

*Keywords:* sheep fleece yield, shearing, Blanc du Massif Central, Berrichon du Cher, meat-type sheep, extensive

### 1. Introduction

Sheep fleece was a very valuable product, a commodity worldwide. Thus, selection focused on developing sheep breeds with excellent fleece indices, such as high yield or fine texture. Therefore, in Hungary, we still have significant flocks of Hungarian Merino (Pajor et al., 2009), which are known for their high fleece yield.

Selling fleece was an important source of income on sheep farms in the 1980s (Vass, 2017, Csernáné Nagy, 2018) that was able to cover a significant amount or even the entire feed costs. Unfortunately, the textile industry, and fleece processors collapsed in the mid-90s in Hungary, so exporting fleece became the only opportunity.

In the last few decades, the shearing costs have exceeded the income throughout Europe, and the demand for buying fleece has dropped due to the COVID-19 pandemic and the trading war between China and the United States of America (Halmos & Toldi, 2022). In 2022, a kg of fleece sold around 80 Ft/kg (Halmos & Toldi, 2022), however, shearing costs exceed 600 Ft for ewes and 1200 Ft for rams in Hungary. Similarly, French sheep farmers struggle with similar prices: a kg of fleece would sell for 0.40 euros, and expect 1–1.5 kg fleece per ewe, while the shearing cost is about 1.95 euros per ewe (Halmos & Toldi, 2022). There is very little demand to buy fleece, so there is an increasing supply at sheep farms.

Therefore, the fleece became problematic for farmers, who transport this product directly to landfills or burn it. Also, in the last few decades, it became evident that producing meat is more profitable, so the population of meat-type sheep started to grow. The majority of these sheep also produce fleece, though in smaller quantities. Since providing data on fleece yield is mandatory only for Hungarian merino flocks, the fleece production of meat-type sheep is not known in Hungary.

Problems related to fleece arose as most of the sheep breeds needed to be sheared annually. However, there is limited access to shearing groups in Hungary. Each year, there are fewer shearers groups as the shearers' average age grows because fewer young people would like to join these groups working physically. Also, shearers groups visiting multiple farms may cause biosecurity issues if the prevention is not appropriate.

The fleece production may be concerning for multiple reasons, such as welfare, heat stress, and extra costs. The thick fleece coverage may be a welcoming environment for parasites that may cause direct pain, which is a welfare problem (Horback, 2019). Also, keeping the sheep restrained might be uncomfortable for the animals.

In addition, climate change causes extreme heat in the summer more frequently, which may cause heat stress for sheep with thick fleece covers. Growing fleece and the potential heat stress may be a burden for maintaining a normal body temperature, using up resources from valuable products such as meat and milk production and reproduction, which may add an additional feed cost too (Piccione et al., 2002; Csizmár et al., 2014). Therefore, lower fleece production became ideal, taking into account the environmental conditions (winter temperature, climate), management, and performance indices.

The objectives of this research were to 1.) compare the fleece production of two French meat-type sheep genotypes, and 2.) provide data on their fleece production, as currently such data should be provided only for the Hungarian Merino genotype in Hungary.

## **2. Materials and Methods**

Data was collected at the annual shearing at the Research Institute at Karcag on 5th May, 2022. Here we collected the freshly sheared fleece from the back and shoulders of ewes' then weighed with a digital scale (one decimal place).

In the experiment, a total of 180 ewes from two genotypes were included: BMC (N=81) and Berrichon (N=99). The ewes were identified individually with tags; their average ages were 2,7 and 3,5 years for the BMC and Berrichon groups, respectively.

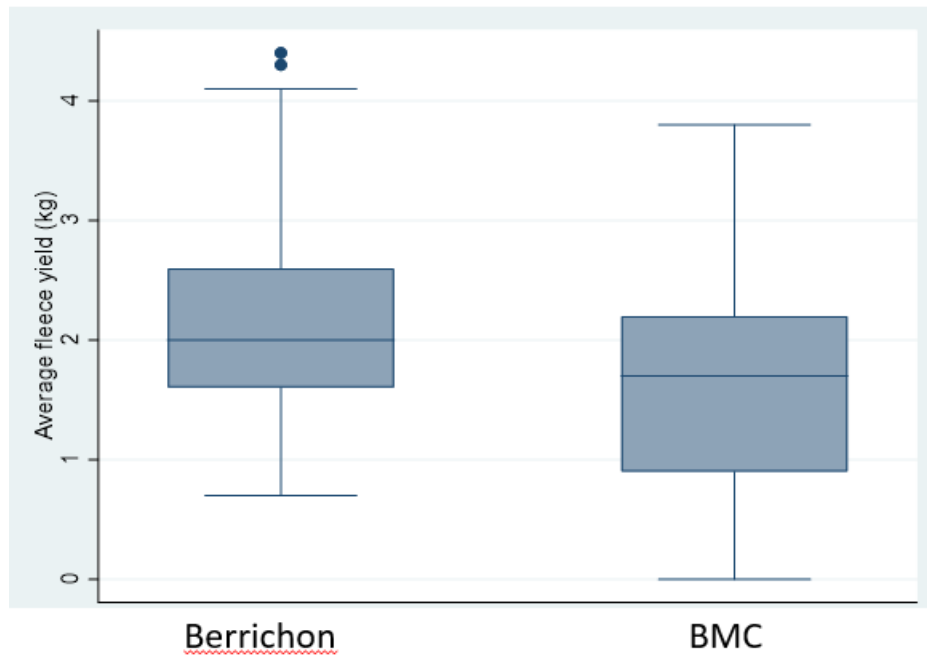
The data showed a normal distribution, and the variance was equal, therefore, the differences in fleece weight between the BMC and Berrichon groups were analyzed with a Student's t test ( $P < 0.05$ ).

The standard deviation was calculated and indicated along with the average fleece weight.

## **3. Results**

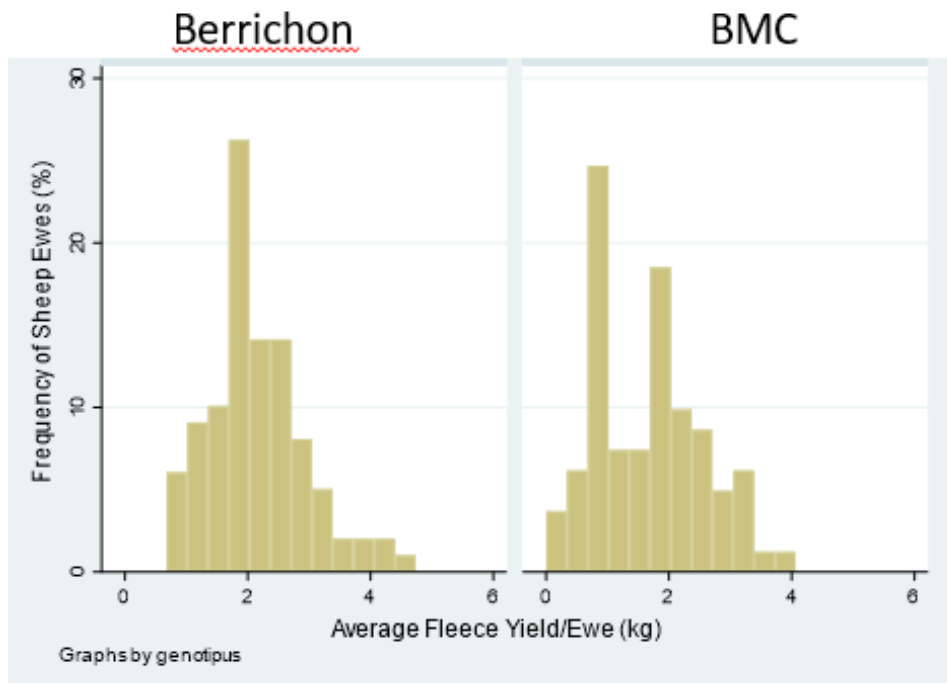
The average weight of fleece produced by the BMC ewes was significantly lower ( $1.66 \pm 0.89$  kg) compared to the fleece production of Berrichon ewes ( $2.14 \pm 0.79$  kg,  $P = 0.0001$ ) (*Figure 1*).

**Figure 1:** Average fleece yield (kg) of Berrichon and BMC sheep genotypes



Source: Author's own editing (2023)

**Figure 2:** Average fleece yield (kg) of Berrichon and BMC sheep genotypes per frequency of sheep ewes (%)



Source: Author's own editing (2023)

The frequency of ewes per fleece weight (*Figure 2*) shows that 66%, i.e., the majority of the BMC ewes produced a maximum of 2 kg of fleece on average. However, most Berrichon ewes produced between 1 and 3 kg of fleece (82%). It is notable, that a third of the BMC ewes produced a maximum of 1 kg of fleece, compared to that of only 6% of Berrichon ewes.

#### 4. Discussion

In the last decades, it is clear that 1.) the vast majority of the income (90%) can be expected from selling lambs (Pajor et al., 2009), which is beneficial for keeping meat-type sheep genotypes; 2.) the price and demand for fleece has been decreasing for the Hungarian sheep, although some opportunities may arise for fine textured Hungarian Merino as a niche market, however, Hungary lacks the fleece processors; 3.) the majority of sheep kept in Hungary grow fleece, thus annual shearing is a must, which is also challenged by the high costs of shearing and the decreasing number of shearers besides potential biosecurity issues.

The significance of our research is providing data on the fleece production of BMC and Berrichon kept in Hungary. The results indicated that the BMC produced less fleece compared to the Berrichon genotype, which could be promising for many reasons: the less amount of fleece grown mostly on the back of the BMC may be easier to access for shearers and take less time the animal should spend in a restrained position, affecting their welfare. These can reduce the costs and increase the profit.

Also, shearing the fleece only from the back of the BMC might mean that less expertise and experience are needed for shearing, therefore, to save money, even the shepherds can execute the annual shearing. The beneficial location of the fleece of the BMC, i.e., the back of sheep is easier to access, especially compared to the Hungarian Merino, which has fleece even on their head, belly, and legs.

Future study is needed to further explore the BMC breed, i.e., further selection of animals with excellent meat production performance, reproduction indices, and less fleece. It is recommended to study the offspring of Hungarian Merino x BMC crossbreeding. There are still a significant number of Hungarian Merino in Hungary (Szabó et al., 2016) and with BMC crossbreeding, improvements of the lambs fattening and carcass characteristics may be expected.

With the popularity of cotton and other cheap materials in the textile industry, it seems that there is still a premium niche market for wool products, mostly for those with a fine texture (less than 24 microns), i.e. Hungarian Merino. Since meat-type sheep have coarse-textured fleece (over 24 microns), the premium wool market is not a solution for them. Alternatively, there is an increasing demand to use fleece as a mulch in gardening to cover the soil and keep the moisture in the soil. In addition to using the fleece in the soil to keep it moisturized. Also, there is a demand to use fleece for insulating buildings.

Sheep shearing robots (Trevelyan, 1989) may contribute to solving the labor and biosecurity issues related to shearing; however, however, it might be expensive and will not help increase the global need for fleece.

In the future, a global increase in demand for fleece and wool is not expected (Notter, 2000). Thus, the demand will be increasing to keep sheep that grow less fleece, and improve meat and reproductivity related characteristics.

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