

## SUMMARY

**Keywords:** *Aubrac, overall quality of meat, rentability*

Bovines and their meat have significant importance for humans from various perspectives. Beef is an important source of high-quality protein, which is essential for the development and maintenance of healthy tissues, the immune system, and other vital functions of the human body. Regular consumption of beef can provide the necessary intake of protein and amino acids for balanced nutrition.

The raising and trading of bovines and beef play a significant role in the economies of many countries. This industry provides employment opportunities and generates income for farmers, processors, and distributors.

Furthermore, beef has significant importance in many culinary cultures and traditions. It is a primary ingredient in numerous traditional dishes and recipes, bringing a distinct taste and flavour to the kitchen.

**The Aubrac breed of cattle** is one of the most well-known and highly regarded beef cattle breeds. Originating from the Aubrac region in southern France, this breed has a long history and is recognized for its superior meat quality. Aubrac cattle have a robust and compact appearance, with a medium to large stature. They have well-defined waists, broad and powerful chests, and sturdy limbs. Their coat is usually light gray to reddish, and some individuals may have a black mask on their face. Despite their massive appearance, they are agile and graceful.

One of the strengths of Aubrac cattle is their adaptability to different rearing conditions. These animals are accustomed to grazing in mountainous and hilly areas, which gives them good resilience to harsh climates and difficult terrains.

The meat from Aubrac cattle is highly regarded for its fine texture, juiciness, and rich flavor. It exhibits excellent marbling, where the fat is evenly distributed within the muscle tissue, resulting in a greater tendency for tenderness and succulence. Their meat is appreciated both locally and internationally, sought after for its quality and distinct taste.

In addition to meat production, Aubrac cattle are also used for other purposes such as draught animals in certain regions, as well as for participation in exhibitions and agricultural events.

For the development of this doctoral thesis, research has been conducted to characterize the quality parameters of beef, with a particular focus on the Aubrac cattle breed. This breed has not been extensively studied in Romania, making it an interesting subject for investigation as it is increasingly imported by cattle breeders in our country.

**The first part of the thesis** is based on consulting bibliographic references from specialized literature, comprising three chapters, regarding the characteristics of cattle, starting from the evolution of this species.

**The second part of the thesis** contributes with original research to complement aspects related to the performance of the animals and the quality of the meat obtained from Aubrac cattle.

**The aim of this research** was to characterize the quality parameters of beef, with the particularity of focusing on the Aubrac cattle breed. This breed, of French origin, has not been previously studied in Romania, but it is increasingly imported by cattle breeders in our country.

To achieve the proposed goal, a well-structured plan of **objectives** was followed, involving several specific research stages:

1. Determination of biometric parameters in Aubrac cattle.
2. Determination of the morphostructure of Aubrac beef.
3. Determination of the physicochemical, microbiological, and sensory parameters of Aubrac beef.

To achieve the objectives of this study, analyses were conducted in specialized laboratories in the field.

The determination of biometric parameters in Aubrac cattle was carried out at a private farm in Romania where Aubrac cattle are raised for meat production.

The determination of meat quality was conducted in laboratories specifically equipped for each respective analysis.

The research was initiated by forming a group of 68 Aubrac cattle, aged between 15-18 months, including 40 males and 28 females. Biometric measurements were performed to assess the body conformation and highlight the specific characteristics of this breed.

Subsequently, activities continued with the collection of meat samples from 38 Aubrac cattle, including 28 males and 10 females. The research focused on four muscle groups:

- a) *Longissimus Dorsi muscle*;
- b) *Psoas muscle*;
- c) *Semitendinosus muscle*;
- d) *Deltoid muscle*;

After slaughter, samples were taken from the carcasses of Aubrac cattle for the analysis of meat morphostructure, as well as for the determination of physicochemical, microbiological, and sensory parameters.

#### **Biometric measurements determination**

In this regard, the research was initiated with the determination of the following parameters: withers height, rump height, oblique body length, rump length, forehead width, chest width, thorax width, thorax depth, thorax circumference, flank circumference, and rump width. The body weight of each studied animal was also determined. Subsequently, body indices were calculated to evaluate the proportions and conformation of the animals and obtain information about their production potential.

Body indices can include ratios between dimensions such as withers height and body length, thoracic circumference and body weight, chest width and thorax depth, etc. These comparative measurements provide information about the proportions and correct development of different body regions, as well as the growth and production potential of the animals.

Within these studies, it was found that there are significant differences in body weight between males and females in the Aubrac cattle breed. The average body weight was 627.27 kg for males, while females showed a lower body weight of 564.76 kg. The overall body weight for the Aubrac cattle studied was 610.82 kg. Significant differences were also observed between sexes in terms of withers height, rump height, chest width, thorax width, thoracic circumference, and flank circumference. Furthermore, significant differences were found between sexes regarding body indices such as body format index, thorax depth index, bone index, basin-thoracic index, basin-pectoral index, robustness index, and dactyl-thoracic index.

#### **The determination of meat morphostructure**

During the conducted research, significant differences were observed between sexes in the longitudinal section regarding the diameter and length of muscle fibers, while in the transverse section, significant differences were noted between sexes in terms of the average diameter and area of muscle fibers comprising the *Longissimus dorsi*, *Psoas*, *Semitendinosus*, and *Deltoid* muscles. Furthermore,

significant differences were observed within the same sex regarding the morphostructure of certain muscles within the studied category.

### **The determination of physicochemical, microbiological, and sensory parameters of meat**

Regarding the physical parameters, significant differences were found between sexes in terms of meat acidity for the Psoas and Semitendinosus muscles. Significant differences were also observed between sexes in terms of brightness, meat hue, color intensity, color saturation (Chroma), color hue (Hue index), and meat texture when analyzing the physical indicators of muscles within the studied category.

In the research concerning chemical parameters, significant differences were observed between sexes in terms of the chemical composition of beef.

Additionally, there were highly significant differences between sexes in the unsaturated fatty acids/saturated fatty acids ratio and the  $\Omega 6$  fatty acids/ $\Omega 3$  fatty acids ratio. The  $\Omega 6/\Omega 3$  fatty acids ratio had an average value of 14.93 for males, while for females, it was only 4.06.

Furthermore, highly significant differences were observed between sexes in terms of the content of M. Longissimus dorsi obtained from Aubrac cattle in Aspartic acid, Glutamic acid, Alanine, Arginine, Phenylalanine, Glycine, Isoleucine, Histidine, Leucine, Lysine, Methionine, Proline, Serine, Tyrosine, Threonine, and Valine.

Regarding the total amino acid content, there were highly significant differences between sexes, with males having an average value of 30.59% and females having 25.97%.

Regarding the microbiological parameters of the meat, it is found that Salmonella bacteria are not detected in the analyzed samples. Additionally, the total germ count values obtained are below the permissible limit, indicating safe meat. The results indicate that the presence of Enterobacteriaceae bacteria is not detected in the analyzed samples.

In the study conducted on sensory parameters, the overall evaluation of the meat obtained from Aubrac breed shows significant differences between sexes, only in terms of the averages obtained from the Longissimus dorsi muscle.

The study of quality parameters allows for constant evaluation and monitoring of the meat quality from Aubrac cattle. These results provide information about the organoleptic characteristics, nutritional composition, and physicochemical properties of the meat, contributing to ensuring high-quality meat and food safety.

The results regarding quality parameters can guide farmers in decisions related to the selection and improvement of Aubrac cattle. This information can be used to achieve animals with superior characteristics such as optimal meat marbling, desired texture, and juiciness, leading to more efficient and profitable production.

Furthermore, the results regarding quality parameters can help identify consumer-preferred characteristics and adapt production to meet market demands. This information can be used to develop marketing and promotion strategies for Aubrac beef, creating opportunities for farmers and increasing demand for this breed.

Obtaining results regarding quality parameters contributes to the development of scientific knowledge and a deeper understanding of the characteristics of meat from Aubrac cattle. This information can be used in further research to explore aspects related to nutrition, genetics, and processing technologies that can enhance the quality and value of the meat.