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RESEARCH ON MORPHO-PRODUCTIVE INDICATORS OBSERVED OF AUBRAC AND ABERDEEN ANGUS CATTLE BREEDS

Bianca-Maria MĂDESCU[1*], Roxana LAZĂR[1], Mădălina-Alexandra DAVIDESCU[1], Andrei-Cristian MATEI[2], Paul-Corneliu BOIȘTEANU[1]

[1]"Ion Ionescu de la Brad" University of Life Science, Faculty of Animal and Food Resources Engineering, Iasi, Romania
[2]Alexandru Ioan Cuza University of Iași, Faculty of Economics and Business Administration, Iași, Romania

*Corresponding author email: biancamadescu@yahoo.com

Abstract

The purpouse of this paper was to highlight the morpho-productive indicators of Aubrac and Aberdeen Angus cattle breeds exploited in Romania. Data were collected from a number of 40 cattle, following the weaning weight (age of 7 months) and the average daily gain increase of the animals, which benefited from similar exploitation conditions. Also, based on the results obtained, a statistical interpretation was performed. At the age of 7 months, an average body weight of 216.6 kg was observed in Aubrac cattle, with an average daily gain increase of 912 g/day, while in Aberdeen Angus cattle an average body weight of 184.3 kg was observed, the animals recorded an average daily gain increase of 799 g/day. In conclusion, in the case of both breeds of cattle, the satisfactory parameters specific to the breeds of meat were highlighted, but making a comparison we can appreciate that the results observed in the Aubrac breed are superior.

Key words*: beef cattle, indicators, performances.*

INTRODUCTION

Beef is a high-quality protein source which can also give very satisfying dining experiences, and demand for it is growing over the world. The beef industry's long-term viability depends on high on-farm efficiency and productivity, as well as efficient value chains that reward meeting target-market standards (Jurie et al., 2015). These elements also help to lessen the environmental and animal welfare implications that are required for provenance and social license. To optimize income and restrict input costs, beef production systems that employ beef breeds should target optimal genotypes and high productivity relative to upkeep for the breeding herd and for growing and finishing cattle, especially feed, which can account for 60% or more of production expenses (Pesonen et al., 2015). Beef production may be sustained where grasslands or rangelands are the principal source of nutrients. This is especially true considering that the feed resources in these systems are unfit for human consumption (Sheveleva, 2008).

Aubrac and Angus breeds are the newest breeds of beef cows that populate farms in Romania. The qualities of adapting to the climate of our country, the profit that can be obtained both from the sale of bulls and processed products, the minimum costs of care, disease resistance, but also the fact that they are very easy to maintain have determined Romanian farmers to give up dairy cows and to raise meat breeds brought in from abroad.

The Aubrac cattle breed originates in France; This breed was imported to Romania in 2013, adapting very well to the conditions of growth and exploitation. Aubrac cattle are medium-sized animals (adult cows: height 130 cm, weight 550-800 kg, bulls: height 140 cm, weight 900-1200 kg). They are rustic animals that have special biological properties, of high resistance and adaptability to diseases and severe environmental conditions, with a very long longevity, being recognized for light calving (Mădescu et al., 2021). They are very easy to maintain, they make very good use of all categories of fodder, they adapt quickly to feeding on large, poor pastures, without significantly influencing their productive level. They are well adapted to harsh local climates and can thrive very well when fed on poor quality pastures (Valadier, 2004). Also, their body is very well adapted to store energy during

periods of abundant food and then they can reserve energy for less favorable periods. The Aubrac breed is famous for the special aroma and tenderness of the meat, having a high degree of marbling, special taste and a very good bone/meat ratio (Figure 1). This ratio of meat to bone leads to a good, consistent carcass weight with superior meat quality (Sheveleva et al., 2021).

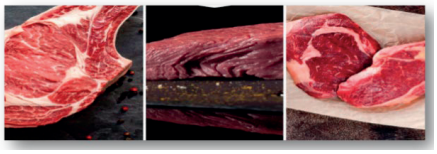

Figure 1. Aubrac beef

The Angus breed is also one of the most popular meat breeds in the country. The Aberdeen Angus breed is native to Scotland; This breed was imported to Romania at the end of 2007 (Gociman et al., 2019). Cows are animals that adapt easily to climatic and environmental conditions, being easy to exploit and meat has special nutritional proportions (Bartoň et al., 2006). It is an excellent breed for extensive growing systems, well suited for grazing, light calving. Cow weight: 500-700 kg, bull weight 800-1000 kg (Mukhamed Shakhmurzov et al., 2021). Fine, marbled meat highly prized (Figure 2).

Figure 2. Aberdeen Angus beef

The average amount of weight gained by an animal each day throughout the feeding period is known as the average daily gain (ADG). ADG is computed by dividing the weight gained by the number of days since the last weight of an animal (Nikolov & Karamfilov, 2020).

MATERIALS AND METHODS

The data collected for this research come from the records of the ANGUS RO association, registered between 2019-2021. In this study, 80 animals were studied, 40 of the Aubrac breed and 40 of the Aberdeen Angus breed, following the weaning weight (age of 7 months) and the average daily increase of the animals, which benefit from similar exploitation conditions (Figure 3).

Figure 3. Aubrac and Aberdeen Angus cattle

The database included information on the calving weight of calves, the average daily growth and the body weight of the animals at 7 months. Also, based on the results obtained, a statistical interpretation was performed. Thus, the productive performances of the studied animals were compared, depending on the breed.

RESULTS AND DISCUSSIONS

Average daily earnings (ADG) is a performance measure that many beef producers monitor.
The average daily gain is simply the rate of weight gain per day over a period of time (Bures, D. and Barton, L., 2012). Average daily earnings (ADG) are an important component of production efficiency for raising beef cattle.
The mathematical relationship between the traits that contribute to efficiency implies that for a pair of calves with the same initial body weight, the one with a faster ADG will reach a target market weight with fewer days of feed and thus could be more efficient due to allocating less food for maintenance.
Table 1 shows the values of the production indicators, registered in the case of the 80 cattle studied, during the period 2019-2021. Thus, a division was made by breeds for which the following indicators are represented: weight at the age of 7 months and average daily gain.

Table 1. The values of the production indicators, registered in the case of the 80 cattle studied

	CATTLE BREED			
	Aubrac		Aberdeen Angus	
No.	Weight 7 M (kg)	ADG 7 M (g/day)	Weight 7 M (kg)	ADG 7 M (g/day)
1	166	739	183	800
2	180	878	164	735
3	209	988	147	615
4	221	1008	210	805
5	273	1146	159	730
6	196	715	177	865
7	303	1266	209	1040
8	272	1099	180	730
9	160	730	250	965
10	172	870	193	915
11	288	1310	198	780
12	233	842	223	915
13	261	1037	181	720
14	188	796	237	1005
15	170	835	208	855
16	200	667	127	425
17	255	1027	134	700
18	162	750	170	830
19	149	710	163	730
20	194	827	173	820
21	166	739	183	800
22	180	878	164	735
23	209	988	147	615
24	221	1008	210	805
25	273	1146	159	730
26	196	715	177	865
27	303	1266	209	1040
28	272	1099	180	730
29	160	730	250	965
30	172	870	193	915
31	288	1310	198	780
32	233	842	223	915
33	261	1037	181	720
34	188	796	237	1005
35	170	835	208	855
36	200	667	127	425
37	255	1027	134	700
38	162	750	170	830
39	149	710	163	730
40	194	827	173	820

Table 2. Production indicators - Aubrac and Aberdeen Angus cattle breeds

Breed	Performance	Mean	Median	Standard Deviation	Kurtosis	Skewness	Minimum	Maximum	Count
Aubrac	Weight 7M (kg)	212.6	198	47.0291	-1.0837	0.49597	149	303	40
	ADG 7M (g/day)	912	856	186.829	-0.5300	0.68222	667	1310	40
Aberdeen Angus	Weight 7M (kg)	184.3	180.5	31.876	-0.3650	0.21685	127	250	40
	ADG 7M (g/day)	799	802.5	138.199	1.2243	-0.62016	425	1040	40

Table 2 shows that the minimum weight at the age of 7 months is 149 kg and the maximum weight is 303 kg in the case of the Aubrac breed, while in the case of the Aberdeen Angus breed there are weights less, than 127 kg minimum and 250 kg maximum, at the same age of 7 months. In 2021, Dydykina et al., observed at 7 months a weight between 151- 206 kilograms in Aberdeen Angus cows, with an average daily gain 590-960 g/day.

Sheveleva and her collaborators observed in 2021 at the age of 9 months a weight between 216 and 310 kg in Aubrac cows, registering an average daily increase of 861-1089 g/day.

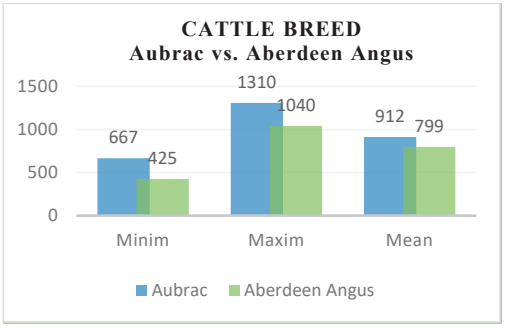

Figure 4. ADG was observed in the two breeds of cows studied (g/day)

Figure 4 shows the observed averages of the 80 animals studied in terms of ADG. The lowest value in the case of the Aubrac breed was 667 g/day at the age of 7 months, and in the case of the Aberdeen Angus breed it was 425 g/day at the same age. It can also be seen that the maximum recorded ADG value was 1310 g/day for the Aubrac breed and 1040 g/day for the Aberdeen Angus breed, respectively.

From Figure 4 it can be seen that the ADG is higher in the case of the Aubrac breed (912 g/day), compared to the Aberdeen Angus breed (799 g/day). Research conducted by Mukhamed Shakhmurzov and his collaborators in 2021, showed an average daily increase of 754 and 675 g/day recorded at the age of 7 months in Angus cows. In 2021, other researchers, namely A.I. Dydykina et al., observed an average daily increase in 590-820 g/day in Aberden Angus calves between 0-7 months and 740-960 g/day at the age 7-12 months. Other authors such as O.M. Sheveleva and her colleagues in 2021, observed an average daily increase of 1089 g/day recorded at the age of 9 months in Aubrac cows.

Table 3. Testing the differences between ADG averages in the case of Aubrac vs. Aberdeen Angus

Pooled Variance	27002.10256
Hypothesized Mean	0
df	78
t Stat	3.075350714
P(T<=t) one-tail	0.001449158
t Critical one-tail	1.664624645
P(T<=t) two-tail	0.002898315
t Critical two-tail	1.990847069

When the null hypothesis was tested, it was found that there were no significant differences between the two variables (ADG for Aubrac breed vs. ADG for Aberdeen Angus breed).

When testing the alternative hypothesis, it was observed that, with an accuracy of 95%, there are significant differences between the two variables studied. Thus, we can appreciate that the Aubrac breed has higher performances than the Aberdeen Angus breed, being observed higher values of ADG.

CONCLUSIONS

This research highlights the productive indicators of beef breeds exploited for meat production, Aubrac and Aberdeen Angus, breeds that are a trend of Romanian beef farms. The observed performances are satisfactory for the Romanian farmers, being in accordance with the exploitation conditions in our country. Research has shown that there are significant differences between the two breeds of cattle, with higher performance in the Aubrac breed. Performance can vary considerably depending on the rearing system, so it is recommended that beef benefit from a balanced diet with a high nutritional value.

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