

## RESEARCH ON GROWTH INDICATORS IN ABERDEEN ANGUS YOUTH CATTLE, ACCORDING TO DIFFERENT INFLUENCING FACTORS

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### Abstract

*The official control of the performance for beef production on farms is the starting point in organization of genetic improvement of the Aberdeen Angus breed in Romania. The weighing with metrological approved equipment for young cattle at seven months, ten months and twelve months are to calculate different performance. The objectives of control of the performance for beef production department are to widen the selection base, to improve the management of farms, to apply the improvement breeding program of Aberdeen Angus cattle in Romania and to send all this information to herd book department to calculate genetic performance. All this activity gives the opportunity to research and follow the evolution of youth cattle in different growth influencing factors.*

**Key words:** Aberdeen Angus, growth factors, youth.

### INTRODUCTION

The official performance control for meat production on the farm is the starting point in organizing the genetic improvement of the Aberdeen Angus breed in Romania. One of the goals are the extension of the genetic selection base, estimation of breeding values and application of breeding program with the help of calculated performances for cattle registered in the herd book of Aberdeen Angus breed. Improving the management of the farms by using the technical reports obtained following the official performance control for the meat production, the development of the infrastructures and the breeding conditions of the cattle (Figure 1). The regional territorial organization of the official performance control for the meat production in the Aberdeen Angus breed calculate the performance of the youth cattle at different ages.

The registration in the official performance control for the meat production is given by the acceptance of the breeder with their cattle in the breeding improvement program of the Aberdeen Angus breed in Romania. The official performance control for meat

production in the breeding farms from birth to weaning for Aberdeen Angus breed applies to cattle according the age category for seven months (G200) which is minimum age from 90 days to maximum 250 days. The official performance control for meat production in the finishing farms of Aberdeen Angus cattle in Romania are two categories like: ten months (G300) minimum age 251 days to maximum 319 days. Last one is the weight at twelve months (G365) minimum age 320 days to maximum 410 days. All this weight controls is performed according to the international regulations established by the ICAR - International Committee for Animal Recording (Grosu and Gociman, 2018).



Figure 1. O.P.C. weighing on the pasture

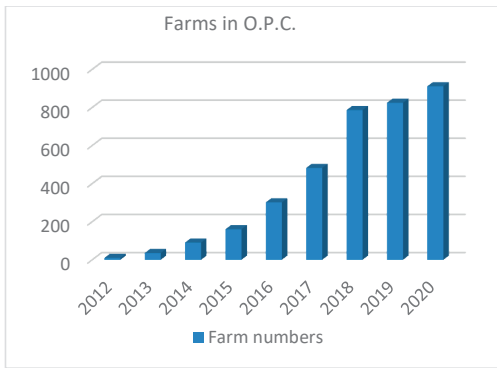


Figure 2. Aberdeen Angus farms in the official performance control in Romania

In Figure 2 is the evolution of Romanian Aberdeen Angus farms in official performance control for the meat production department. In Figure 3 are the evolution of Aberdeen Angus cattle in the official performance control for meat production department.

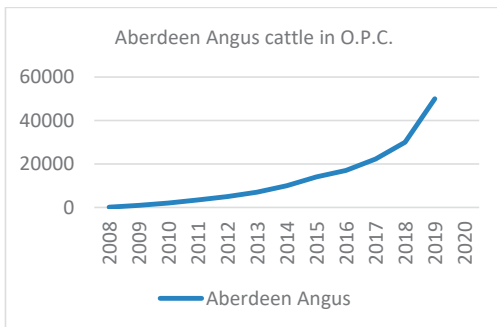


Figure 3. Aberdeen Angus cattle in the official performance control in Romania

## MATERIALS AND METHODS

The official performance control for meat production is carried out by the control methods A, B and C. There are two mandatory controls weighing per year. Method A - all the controls are performed by an official representative of an association accredited to perform the official performance control for meat production by the herd book of the breed. Method B - all controls are carried out by the breeder or his representative. Method C - all checks are performed by the breeder or his representative and a representative of the accredited control association. The interval between two weighing is at least 60 days and not more than 210 days.

Aberdeen Angus Romanian Association who is the only accredited herd book society for Aberdeen Angus breed in Romania is using for the official performance control for meat production only method A. Using only method A increase the accuracy of the data.

The official performance control for meat production is performed by the Aberdeen Angus Romanian Association with legal approved trailer scales. The scales used to determine the weight, must have the following requirements: each scale used in the official performance control for meat production must be subjected to periodic metrological checks by the laboratories in the structure or subordinated to the Romanian Office of Legal Metrology or, as the case may be by the metrology laboratories authorized by them. The metrological checks of the scales are made annually, each verification is recorded in the metrological record that will be presented at each weighing control in farms. The scale must have a platform and a metal fence for the containment of the cattle.

Within the Aberdeen Angus Romania Association having member farms from the plain to the mountains region, the basic equipment for control official performance for meat production is off road cars and trailers with approved scale.

Before the official performance control for meat production in the Aberdeen Angus breed begins, the origin of each animal must be certified (validated) and entered only in the software program "BIDAA - Aberdeen Angus Data Base", granted by the Aberdeen Angus Romanian Association for calculation and estimation of performance for the genetic value of an animal (estimation method that contains the relation between the animals and the performances of each one - animal model Henderson). The identification and individualization are attributed to the breeder's to ensure the notification documents.

The farmer has the obligation to communicate in time all the events on the farm according to the notification documents: registration the natural breeding or artificial insemination (annex 3), registration of the calving (annex 8) and entries/exits, selling, bringing to slaughterhouse (annex 10) (Grosu and Gociman, 2018)



Figure 4. O.P.C. trailer scale equipment

This study was conducted in two farms, located in Calarasi county plain area in south region of Romania and in Sibiu county mountain area in the middle region of Romania. The research were made on a number of 50 calves of Aberdeen Angus breed with average age of seven months that have been studied for two years. We weighted the cattle at birth, 7, 10, 12 and 15 months (Grosu and Gociman, 2018)

## RESULTS AND DISCUSSIONS

Romanian area is 237,500 km<sup>2</sup> wide, consisting of a symmetrical landforms, concentric and varied, with the main features of landforms proportioned as follows: 31% mountains, 36% hills and plateaus, and 33% plains. Large pasture lands, climate, precipitation variation, soil, quality feed are some of the great strengths of Romania to grow such an extensive cattle breed.

Second country from European Union with surface of pasture, the sixth country from European Union as agricultural area and the ninth country from European Union as number of cattle (more then 70,000 pure Aberdeen Angus cattle) (Gociman et al., 2019; Vidu et al., 2015).

Example: 237,500 km<sup>2</sup> x 36% hills = 85,500 km<sup>2</sup> hills - in Romania

85,500 km<sup>2</sup> hills x 1,000,000 m<sup>2</sup> (1 km<sup>2</sup>) = 85,500,000,000 m<sup>2</sup> - in Romania

85,500,000,000 m<sup>2</sup>/10.000 m<sup>2</sup> = 8,550,000 hectare - in Romania

Final result: 1 hectare for 1 cow - 8,550,000 breeding beef cows in Romania.

To have minimum: 1,000,000 beef cattle in Romania

Romania is a country with high agricultural potential given that the geographical

configuration and favorable climate. Our country is not part of countries that have to import substantial amounts of food because, under normal circumstances, this land can produce more food for a population of three and a half times higher than the current population (Gociman et al., 2019).

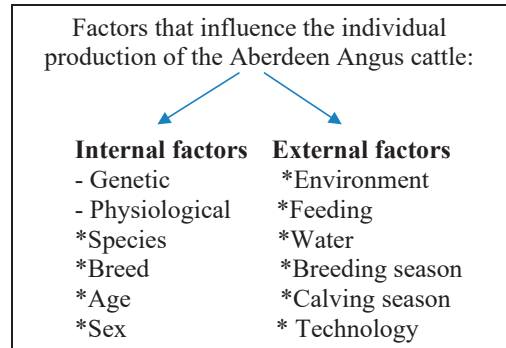


Figure 5. Influencing factors

### Phenotype = Genotype + Environment

Having in Romania these variations of climate and landforms, the Aberdeen Angus cattle vary from point of breeding, increases from area to area (Figure 5). By selection according to performances, we aim to increase the quantities and qualities of romanian Aberdeen Angus beef production as well as the performances of the farms (Table 1).

Table 1. Average weight of Aberdeen Angus cattle in two farms (kg)

Farm	Age (month)	n	X ± Sx	Sx	V%
Sibiu	Birth	50	34±1.63	3.98	12
Calarasi			36 kg ± 0.62	1.51	4
Sibiu	7	50	211± 6.64	42.56	20
Calarasi			296± 8.9	23.49	8
Sibiu	10	50	282 ± 13.91	43.92	16
Calarasi			377 ± 8.1	37.78	10
Sibiu	12	50	316 ± 6.07	39.78	13
Calarasi			468 ± 32.77	65.53	14

From the analysis on the body dynamics weight, over a period of 12 months, on the 100 calves, from two farms located in different pedoclimatic areas, we observe the following:

- at birth the average body weights were close to the farm in Sibiu and Calarasi;
- at 7 months between the two farms we observe large differences in body weight, respectively in Calarasi farm, the average weight is 28.72 % higher than the bulls in Sibiu farm;
- it is worth noting that the group from Calarasi is very homogeneous (8% V), the average daily increase is 1308 g;
- the group from Sibiu achieved really small average daily gain increases (895 g ADG), has very high variability (20%) differences are explained by a less balanced of fodder diets;
- at 12 months the difference of the average body weight is accentuated, respectively the group from Calarasi have a greater body weight then from Sibiu 32.48%. Inside the batches the weights are balanced, they become really homogeneous (14-15% V)

Table 2. Average average daily gain (ADG) of Aberdeen Angus cattle in two farms (g)

Farm	Age (month)	n	$\bar{X} \pm S_x$	$S_x$	V%
Sibiu	Birth	50	-	-	-
Calarasi			-	-	-
Sibiu	7	50	895 ± 33.18	215.3	24
Calarasi			1308 ± 42.16	111.3	8
Sibiu	10	50	835 ± 45.90	145.04	17
Calarasi			1143 ± 26.65	124.73	11
Sibiu	12	50	779 ± 16.55	108.43	14
Calarasi			1192 ± 92.05	184.09	15

Regarding the average daily gain increase (Table 2), the group from Călărași have average daily gain increases between 1143 g and 1308 g and the group from Sibiu have average daily gain increases between 779 and 895 g. Among the celebrities are firm and differential by 31.57%. The farm in Călărași follows a curve of good growth .

The Aberdeen Angus Romanian Association was in 2013 accredited the first association in Romania to do the official performance control for meat production (Figure 6).

After many weighing thousands of calves of Aberdeen Angus breed in Romania, we discover that after weaning (approximate seven months) due to the maternal stress of the calf lose a lot of weight and they have no feeding appetite.



Figure 6. Aberdeen Angus young bulls before weighing

Worldwide from research conducted by large specialists in the animal welfare department, it has been found that there are two types of cattle, those that control more stress “reactive” and those that control less stress “proactive”(International Beef Cattle Academy, 2018/2019).This physiological cattle fact is controlled by the adrenal gland cortex, which controls the hormone cortisol responsible for stress. Below in the two figures you will find two examples of bulls within the association, the first being proactive and the second one reactive.

Bull 1008 comes from Aberdeen Angus farm in Sibiu county Transilvania Romania, was born in 10.07.2018 with a weight of 30 kg, his name is SOBIS U088 and is red color variety.

Bull 4849 comes from Aberdeen Angus farm in Calarasi county south Romania, was born in 02.09.2018 with a weight of 38 kg, his name is COCONI U849 and is black color variety.

In the table below (Table 3) we see two different types of feeding with more or less concentrate in diets.

It can be seen from Table 4 that the Călărași lot benefits from a ration structure with a higher proportion of high quality fibrous feed (hay and alfalfa) 53.33%, unlike the one from Sibiu (Table 3) where straws are used in proportion of 33.33%.

Table 3. Feeding diet in Aberdeen Angus farm from Sibiu county

Forage	Quantity
Straw	4 kg
Corn silage	4 kg
Corn	2 kg
Oat	0.5 kg
Wheat	0.5 kg
Soy bean	0.5 kg
Sun flower bean	0.5 kg
Total forage	12 kg

Table 4. Feeding diet in Aberdeen Angus farm from Calarasi county

Forage	Quantity
Hay	4 kg
Alfalfa	4 kg
Corn silage	4 kg
Corn	2 kg
Wheat	0.5 kg
Oat	0.5 kg
Total forage	15 kg

Bull “1008” is grown in the Carpathian mountains with intensively feeding (straw+concentrated) and the bull “4849” is grown in Romanian Dobrogea plains intensively with another feeding (hay+concentrated). In this case we can see in Figure 7 and Figure 8 the results of genetic and physiological potential of Aberdeen Angus breed (proactive vs. reactive).

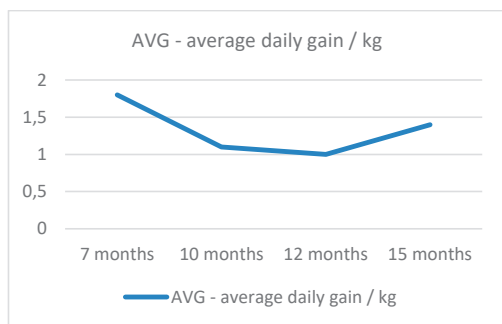


Figure 7. Bull 1008 weighing at different ages and the stress after weaning (proactive)

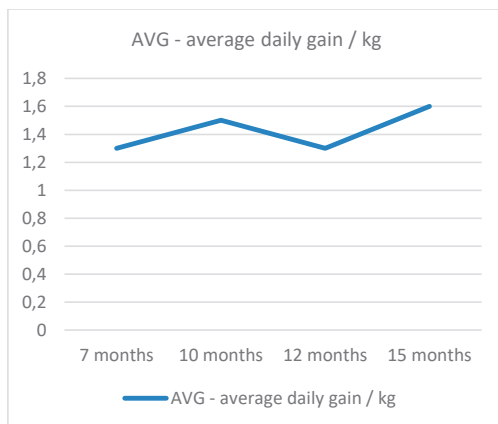


Figure 8. Bull 4849 weighing at different ages and less stress after weaning (reactive)

## CONCLUSIONS

After all those years that Aberdeen Angus Romanian Association weighted thousands of youth Aberdeen Angus cattle and visit thousands of farms to achieve the main goal : genetic improvement of quality and quantity Romanian beef, we discover many interesting science results. We respect the improving Aberdeen Angus breeding program in Romania to make genetic progress.

All this internal and external factors have a big influence according youth Aberdeen Angus growth like: environment, climate, relief feeding, water, stress, welfare and genetics etc. Romania should not be part of the countries forced to import substantial quantities of food, the pedoclimate configuration is favorable to produce the needs for the local population and much more. We need in European Union fresh beef with trasability not to import from another continents.

Romania has to become a European beef brand country.

## ACKNOWLEDGEMENTS

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