

*P. P. Dzhus, O. V. Sydorenko, O. V. Bilous, R. G. Pashyan, R. F. Katsevych, O. V. Martynyuk. Assessment of bulls on their own performance as a part of Aberdeen-Angus native population improvement*

**Introduction.** Aberdeen-Angus breed, selection achievement of United Kingdom, long time ago ceased to be merely a cultural heritage and became a global transcontinental obtainment in beef cattle breeding. Productive "attractiveness" of Aberdeen-Angus breed makes it a popular genetic resource in the cattle branch production. It causes the optimistic results of the statistical analysis of farm animal biodiversity for data of European EFABIS data base, according which the status of this breed can be defined as "not at risk".

Ukrainian population of Aberdeen-Angus formed in 1961 by importing breeding stock from Canada and animals of compact small type of Scotland (1962) and the establishment of breeding plant at the research station "Vorzel" of Agrarian Academy of Ukraine. The modern breed area covers 11 regions of Ukraine. According to the State register of **breeding subjects in animal breeding** on 01.01.2016, the stock has 7637 controlled heads (including 3475 cows, 80 bulls) and concentrated in 23 breeding subjects. For a long time, the Principal breeding center of Ukraine engaged with breeding farms' development and controlled the situation in the breed. At this institution base bulls were evaluated, semen was sampled and stored, information database of individual data was being formed and automated, breeding program were developed and plans for the bulls' matching were formed.

Currently low share of artificial insemination at 18%, lack of control of live bulls involvement in the matching campaign, limited activities of regional breeding associations on centralized bulls' assessment resulted in irreversible changes in the genetic structure of Aberdeen-Angus population, phenotypic manifestation of which is the youngsters' growth and development declining, low efficiency of feed conversion, cows' milk production decreasing, impairment in reproductive quality, increased exterior faults' and genetic anomalies level. One of the measures for improvement of breeding herds is individual evaluation of bulls, which can optimize the selection and matching of bulls for breeding stock for calves of high breeding value production. However, the re-orientation in consumer demand, incapability of internal market to ensure profitable beef production and breaks of export-import relations naturally led to a weakening of motivation for breeding bulls branch business and its state control. Thus, according to the technology of beef cattle breeding mainly with natural mating feasible is the realization of sires' on their own performance evaluation initial phase directly at the base of breeding farms in accordance with "Instructions on beef bulls' selection" and to perform the Ministry of Agriculture Order N154 on 13.04.2016 on the approving of the "Procedure of sires' breeding value determination by pedigree, their own performance, and progeny quality testing."

Analyzing the quantitative and qualitative indices of economic activity we've found that one of the prospective objects for future beef bull evaluation is breeding farm "Buffalo" of Manevychi district, Volyn region. There are 850 Aberdeen-Angus

dams (cows, heifers), evaluation power of the farm gives the possibility to evaluate simultaneously more than 400 animals. So, the aim of this paper is the analysis of Aberdeen-Angus bulls' evaluation on their own performance results.

**Materials and methods of research.** The study engaged 30 Aberdeen Angus breeding bulls of "Buffalo" farm. The selection of animals for evaluation was performed at the 210 days' age with previously conducted individual analysis of their growth during suckling period, using the materials of electronic information database "ORSEK-M". At the time of evaluation diet of growing calves presupposed gain getting not below 1200 g per day. Analysis of the growth and development of youngsters was done by the results of monthly weighing during the period from 8 to 12 months. Key bull's measurements was taken at 12 months' age. The evaluation was carried out according to Regulation "Instruction on beef bull selection". Statistical data processing was performed, using the Microsoft Excel software.

**Results.** Algorithms of determination and calculation of selection indices for evaluation of beef animals are chosen by representative organizations and approved at the level of each state. For countries participating INTERBULL (INTERBEEF) bulls' evaluation results are converted to a common information data base on which the matching and comparison of data for further use in the breeding work correction. The main features taken into account in the assessment of the breeding value are share of pure blood, live weight at different ages, the intensity of growth for average daily gains, exterior parameters (body measurements, linear features), milk production, calving ease, temperament (for some breeds, such as Charolais), term of economic use, sperm productivity indices and others. According to international recommendations EBV and EPD indices are calculated, which define contribution weight of each feature into integrated breeding value of an animal. Under the current law of Ukraine, the evaluation of beef animals is done with the definition of an integrated class at appraisal, bulls are evaluated by index A – own performance, B – quality of progeny. The main results of sires' evaluation were obtained during the process of native beef breeds creation.

In the course of our studies we've initially selected bulls of Aberdeen-Angus breed, taking into account the indices of their individual growth till 7-months' age. Totally there were selected sons of 7 Aberdeen-Angus bulls, including 5 native and 2 of German selection. Native bulls were of Wright Iver 9251195, BV Vinton 1342, Sauthoma Extra 715968, V.B.M. Henri 158013 lines.

At 210 days' age the average live weight of calves was  $228,03 \pm 6,750$  kg, the average daily gain –  $964,1 \pm 30,881$  g. Coefficient of variation for average daily gain at 17.5% reflects both the individual differences in eating behaviour of the researched calves during suckling and the differences in their mothers' milk production and nutritional value of milk. The average live weight of animals evaluated at 12 months was  $389,3 \pm 8,35$  kg, average daily gain when growing –  $1114,47 \pm 34,208$  g. The coefficients of variability of these traits are under 11.5% and 16.8% accordingly.

Average live weight at weaning and at 12 months' age exceeded its corresponding values, determined due to the minimum requirements for live weight of beef calves to reach the complex class "elite" and "elite-record."

Phenotypic features of farm animals' body built are the indicators of species' and breeds' specificity and individual characteristics of the organism, the totality of which forms the parametric basis for primary estimation of genetic potential of productivity. Expressiveness, harmony and age matching of body parts outline a general picture of individual growth and development and reflect the level of balanced nutrition and optimal technology accepted as a whole. At the group studied the bull's average height in rump at the age of 12 months was  $115,70 \pm 0,622$  cm with a coefficient of variation 2.9%. Chest girth is  $158,33 \pm 1,18$  cm with variability 1.2%. Average body length was  $126,63 \pm 1,162$  cm with a coefficient of variation 5.0%. Testicular circumference, as one of the evaluation parameters of bull reproductive system, was  $31,10 \pm 0,564$  cm with a coefficient of variability 9.9%. Thus, among the recorded traits, the largest variability was indicated on live weight, average daily gain and scrotal circumference. The least variability was indicated on rump height and chest girth.

Average value of complex selection index on all the researched bulls is  $100,5 \pm 0,9$ . According to the positions of Instructions, 14 calves with complex selection index above 100.0 may be allowed for further use as at the herds with natural mating, so put for assessment on sperm productivity at the State Enterprise "Volynian regional agricultural production enterprise on breeding business in animal breeding." This will allow to re-new the genetic material store from native valued representatives of the Aberdeen-Angus breed and partially restore local control over the use of sires in breeding herds as well as in households.

Therefore, it is feasible to continue similar research involving a larger number of animals, to consider the power of influence of mother genotype and conduct further evaluation of sires of Aberdeen-Angus breed on performance of their sons and daughters.

**Conclusions.** In similar conditions of feeding and management the realization of the genetic potential of productivity of Aberdeen-Angus bulls is different. The given results are the first step in the organization of systematic evaluation of sires' breeding value, analysing of inheritance of key traits of growth and development of animals and rationalization of the use of genetic resources of the breed in general and reduction in cost per unit of production in live and carcass weight.

**Keywords:** beef cattle, Aberdeen-Angus, bulls, live weight, growth rate