EVALUATION OF HEIFER PIGS OWN PRODUCTIVITY INDEX USING THE METHOD SELECTION

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Using an index of replacement young pigs assessment is conducted a selection of animals in an industrial complex. The results demonstrate the effectiveness of the proposed indices: age achieve of live weight 100 kg decreased by 5.1 4,8- days, the cost of feed per 1 kg of growth decreased by 0.1-0.2 kg ($r \leq 0,001$), the thickness of bacon decreased by 2.4 mm ($r \leq 0,001$) and 1.5 mm. It is proved that the use of selection indexes in selecting heifer replacement facilitate selection of the best individuals of the herd that will improve the efficiency of the selection process.

Pigs, selection index, heifer, large white breed, landrace, selection.

Nowdays an index selection is spread significantly in the world swine breeding. An analysis of breeding programs around the world shows that they are designed mainly involving various indices. The essence of this approach is that further work in the herd animals are selected on the basis of an integrated assessment of their breeding values, while animals culling performed a flexible scheme, which greatly improves the efficiency of selection [1]. In the selection of animals by value of an index are selected for repair herds those which havie the characteristic value higher than typical for this pig herds.

The selection index theory for complex traits according to plant breeding was developed in the 40s of the twentieth century by U.Smit. In animal breeding for selection of animals by productive features the index theory was developed by A.Hasel [9]. In subsequent years, many studies have been conducted on the development and improvement of breeding indices as in foreign countries as in Ukraine [8, 4, 3, 6, 7, 5]. In modern programs for the prediction of breeding values of animals is used the Best Linear Unbiased Prediction, this method works effectively in countries with developed pig breeding - of Denmark, Germany, Britain, France and others. However, at this time in Ukraine has not created a common methodology and software system estimation of animals according to international standards [9]. Therefore, an urgent task in the pig breeding is to find effective techniques and methods of speeding up the selection process.

Purpose of this paper – identify a tribal value of young pigs of large white breed and Landrace using the selection index.

Material and methods of research. Studies conducted in PAS «Bahmutskiy Agrarian Union" Artemovsk area, Donetsk region.

An object of research - breeding value of pigs of large white breed of factory type "Bahmutskiy" with heredity and 50% of the Hungarian selection and

Landrace breeds. A subject of research - evaluation of young pigs using index selection.

The estimation of heifer followed the terms of their own productivity, taking into account the age of the achieving a live weight of 100 kg (days), average daily gain (g), bacon thickness (mm), the cost of feed per 1 kg increase (kg), body length (cm).

A construction of selection indices for complex traits was performed by the algorithm proposed by M.V.Myhaylov [6] .The conditions of feeding conform with the standards adopted by pig enterprise.

Research results. It is known that selection occurs simultaneously on several grounds, with both positive and negative correlation dependence. In case of a positive relationship signs, they can be improved even in selection of only one of them; with a negative correlation coefficient, increase of one feature reduces the other. One of the most effective methods of evaluation and selection of animals on the grounds that negatively correlated, is the use of selection indices. This is because the selection index can integrate a number of features in an assessment that is highly dependent on genotypic evaluation proband. In addition, the indices give the opportunity to find the optimal combination of features and levels, according to their inheritance, to achieve the greatest possible genetic progress per generation [2].

The purpose of constructing the selection index is a calculation of breeding value of animals. Selection index is a complex mathematical construct that includes natural values, breeding genetic and economic parameters (coefficients). It should be noted that the use of developed indices for the evaluation and selection of pigs will be possible only if the following conditions [10]:

- during the breeding inbreeding was not used;

- an information about phenotypes, which an assessment is based on, should be representative;

- the data of productivity should be corrected taking into account different environmental impacts (year, month farrowing, age of animals, etc.).

The use of the selection index in breeding work is needed to improve the efficiency of selection through choosing for aggregate genotype, which is estimated on the basis of phenotypic, genetic and economic parameters of productive characteristics and their deviation from the medium level in the population. But the use of selection indexes in breeding farms is limited, due to the imperfection of the method of their construction.

Based on the above, we have developed breeding selection indices for repair boars to their use in breeding.

The main features of the parental lines are: precocity, average daily gain, thick bacon and feed conversion. In constructing of the index was taken the data of negative variant herd animals productivity that is received by the control breeding of heifers: age achieve live weight of 100 kg - 199 days of bacon thickness - 27 mm, feed conversion - 3.3 kg. The next stage of work was to determine the target standards for heifers on the control breeding using factor inheritance, selection differential, the effect of selection.

A measure of the intensity of selection is the selection differential (Δg), defined as the difference between the mean value of a selected group and the mean value of the population. The effect of selection for one generation is calculated by the formula: $SE = \Delta g h2$, where Δg - selection differential, h2 - coefficient heritability of the trait in a given population.

Trust standard for replacement chicks on the control cultivation was: age achieve live weight of 100 kg - 170 days of bacon thickness 12.72 mm, feed conversion - 2.21 kg. The method of constructing the index provides, as mentioned above, the selection and definition of the economic value of each trait, which is included in the index. In this figure we took coefficient inheritance as defined showed that age live weight achieve it is 0.22, the thickness of bacon 0.43 for feed conversion - 0.52. Thus, the proportion of breeding values of each feature will be equal to: precocity - 18.80%, the thickness of bacon - 36.76%, feed conversion - 44,44%. Based on these values for each feature set weighting factor, which is defined as:

K = the specific mass index signs / symptoms limits the minimum value to the target standard Designed index for selecting replacement chicks is: I = 0.648 (199 - X1 + 2.574 (27 - X2) + 40,400 (3.3 - X3) where X1 - achieving age live weight of 100 kg, days, X2 - thick bacon, which is defined by ultrasound, mm X3 - conversion of feed, kg.

After removal of boars of Large White breed and type of plant to heredity 50% of the Hungarian animal breeding and Landrace breeds used for commercial hybrids fattening, growing from control evaluation conducted by the selection index (Table. 1). It was established that plant type animals had the best performance on a comprehensive assessment, but Landrace boars were significantly higher than for their main features that are selected at 19.49 units. (R≤0,01). Analysis of the data shows the advantage of Landrace boars under Large White breed animals for precocity of 10.4 days (R≤0,01) for average daily gain on 0,92k g (R≤0,001) for feed conversion of 0.2 kg (R≤0,01), the length of the body - 6 cm (R≤0,001).

1. Results control growing boars repair

Species	п	Age achieve a live weight of 100 kg, days	The average daily growth, kg	Feed conversion, kg	Body length, cm	The thickness of the bacon, mm	Index
FT LW	45	170,5±1,86	0,82±0,01	2,4±0,04	116,9±0,62	14,0±0,64	89,83
LW h./s.	34	172,7±2,05	0,81±0,02	2,5±0,05	118,7±0,58	13,0±0,73	87,40
average	79	171,5±2,21	0,82±0,01	2,4±0,03	117,7±0,44	13,6±0,48	88,73
Landrace	12	161,1±2,42	0,91±0,02	2,2±0,06	123,7±1,17	12,1±1,27	108,22

Note: FT LW - pigs of large white breed of factory type "Bahmutskiy"; LW h./s. - pigs of large white breed with heredity 50% of the Hungarian selection.

For further work in the herd plus variant of animals with more than 100 units for the Large White breed and more than 115 units - for Landrace were selected (Table. 2). As a result of the selection the average index value for the Large White breed animals to be used in selection and breeding work increased by 15.6 units., and Landrace boars for - 14.3 units., While the tendency to reduce the age of achievement live weight of 100 kg, respectively, 5.1 and 4.8 days, reduced feed consumption per 1 kg increase of 0.2 kg ($R \leq 0,001$) and 0.1 kg, bacon thickness decreased by 2.4 mm ($R \leq 0,001$) and 1.5 mm. Thus, the use of selection index in the selection of heifer replacement facilitate selection of the best individuals of the herd as a result it will increase the efficiency of the selection process.

2. Indicators of repair boars selected on selection index

Species	п	Age achieve a live weight of 100 kg, days	The average daily growth, kg	Feed conversion, kg	Body length, cm	The thickness of the bacon, mm	Index
FT LW	22	164,0 ±1,48	0,87 ±0,02	2,2 ±0,04	117,5 ±0,91	11,8 ±0,51	104,37 ±1,97
LW h./s.	19	168,7 ±2,79	0,84 ±0,02	2,3 ±0,04	118,7 ±0,88	10,5 ±0,49	103,94 ±1,87
average	41	166,4 ±1,53	0,86 ±0,01	2,2 ±0,03	117,8 ±0,63	11,2 ±0,37	104,32 ±1,35
Landrace	7	156,3 ±2,36	0,92 ±0,03	2,1 ±0,05	122,9 ±1,55	10,6 ±1,11	122,49 ±2,53

In order to test selection index for integrated assessment of total genotype replacement chicks on their own performance was studied correlation index values with those included in its composition. The high statistically significant correlation with the index of feed conversion index ($r = - 0,68$, $R \leq 0,05$) skorospilosti ($r = - 0,67$, $R \leq 0,05$), bacon thickness ($r = - 0.60$, $R \leq 0,05$) and average daily gain ($r = 0,52$, $R \leq 0,05$). Our data suggest that the selection index can be regarded as a model for assessing breeding value of animals and use them in the selection for the formation of high-performance herds.

Conclusions and recommendations for further research. The estimation of breeding value of replacement young pigs using a selection index is recommended for implementation in breeding herds in the selection of pigs for later use in the herd, which will increase the intensity of growth of animals and meat of pigs receiving.

Prospects for further research is to develop a selection index for boars and sows on the reproductive ability.

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