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**INDEX OF A. SASER - H. FREDIN AND ITS USE AT EVALUATION OF YOUTH PIGS FOR LIVING AND MEAT QUALITIES**

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*The article presents the results of studies of fattening and meat characteristics of young pigs of large white breed of different breeding lines using the of index estimation A. Sazer - H. Fredin.*

*It is established that the young pigs under control of the herd (LLC "Agro-Elite» of Dnipropetrovsk region) are characterized by sufficiently high indicators of fattening and meat quality. By the age of reaching 100 kg live weight, the length of the chilled carcass and the thickness of the pelvis at 6–7 thoracic vertebrae, they exceed the minimum requirements by class «elite» an average of 5.92 %.*

*The correlation coefficient between the indicators "average daily weight gain for the period of fattening from 30 to 100 kg, g", "age of reaching live weight 100 kg, days", "feed consumption per 1 kg of increase in live weight, feed units", "thickness of the spine at the level of 6–7 thoracic vertebrae, mm" and "area of the "muscular eye", $cm^2$" and evaluation indices ranges from -0.527 (P <0.001) to +0.528 (P <0.001).*

*On the basis of the above we propose in the conditions of breeding plants and reproducers, as well as industrial complexes, to evaluate the young pigs and animals of the main herd, both according to the requirements of the Instruction on pig testing, and based on the use of the index of A. Sazer - H. Fredin.*

***Keywords:*** *young pigs, breed, fattening and meat quality, indexes evaluative, variability, correlation.*

Results of researches of scientists and experience of work of experts of agricultural formations testify, that genetic factors and factors of feeding and keeping are significantly influenced by indicators of fattening and meat qualities of young pigs of different breeds, types and lines. In order to increase the level of breeding work for these groups of traits, a number of zootechnical methods are used, among which the method of estimation according to breeding and evaluation indexes [1–12].

The aim of the work is to investigate the indicators of fattening and meat characteristics of young pigs of large white breed of different genealogical lines using the A. Sazer - H. Fredin estimation index, to determine their variability and to calculate the level of their relationships.

***Material and research methods.*** The study was conducted in the conditions of the breeding plant of the large white breed LTD «Agro-Elita», Dnipropetrovsk region, «Dnipro» meat-packing plant and livestock laboratory of the State Institution Institute of grain crops of the NAAS of Ukraine. The work was carried out in accordance with the program of scientific researches of the National Academy of Sciences of Ukraine № 30 "Pigbreeding". The object of research was a young pig of a large white breed of the Chenghis and Slavutich lineages.

The evaluation of young pigs by fattening and meat quality was performed taking into account the following indicators: average daily weight gain for the period of fattening from 30 to 100 kg, g; age of reaching live weight of 100 kg, days; feed costs per 1 kg gain, feed. units; length of the cooled carcass, thickness of the spike at the level of 6–7 thoracic vertebrae, mm; area of the "muscular cell", $cm^2$; weight of the back third of the cooled half of the carcass, kg. The cost of feed was taken into account on average during the accounting period.

The evaluation index of A. Sazer - H. Fredin was calculated by the formula:

$$I = \frac{1}{\sigma_g} \times \Delta G_1 - \frac{1}{\sigma_f} \times \Delta F_1, \text{ where}$$

*I – index of A. Sazer - H. Fredin, score; $\Delta G_1$ – the growth rate in deviations from the mean; $\Delta F_1$ – the thickness of the spike in deviations from the mean; $\sigma_g$ – the phenotypic standard deviatio of growth rate; $\sigma_f$ – the phenotypic standard deviation of the thickness of the spike [13].*

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The results of the studies were processed by the method of variation statistics according to G. F. Lakin [14]. The difference between the arithmetic mean of the two samples was considered significant under the conditions P <0.05, P <0.01, P <0.001.

***Results of research.*** Analysis of the primary zootechnical documentation and the results of our own studies show that young pigs of the large white breed controlled herd with the age of reaching live weight of 100 kg, the length of the cooled carcass and the thickness of the pelvis at the level of 6–7 thoracic vertebrae exceed the minimum requirements for the "elite" class by 5.92 % (Table 1).

According to the indicator «feed consumption per 1 kg of live weight gain, feed units» animals belong to class I. Indicators of "feed consumption per 1 kg of weight gain", area of the "muscular eye", "mass of the back third of the cooled hemisphere" are 4.04 ± 0.032 feed units, 35.39 ± 0.699 $cm^2$ and 10.3 ± 0.15 kg. The coefficient of variability (Cv, %) of these features ranges from 2.97 to 11.97 %

***1. Fattening and meat qualities of young white pigs of the control of the herd, n = 33***

| Indicators, units | Biometric indicators | |
|---|---|---|
| | $\overline{X} \pm S\overline{x}$ | Cv ± $Sc_v$, % |
| Feeding qualities, n = 33 | | |
| The average daily gain of live weight during the fattening period is 30 to 100 kg, g | 702,5 ± 8,23 | 6,62 ± 0,815 |
| Age of live weight 100 kg, days | 184,4 ± 1,20 | 3,69 ± 0,415 |
| Feed costs per 1 kg of weight gain, feed. Units | 4,04 ± 0,032 | 4,58 ± 0,564 |
| Meat quality, n = 15 | | |
| The length of the cooled carcass, cm | 95,7 ± 0,50 | 2,97 ± 0,542 |
| Thickness at 6–7 thoracic vertebrae, mm | 26,4 ± 0,52 | 11,27 ± 2,060 |
| Area of «Muscle eye», $cm^2$ | 35,39 ± 0,699 | 7,39 ± 1,351 |
| Weight of the back third of the cooled half-carcass, kg | 10,3 ± 0,15 | 5,52 ± 1,009 |

The results of the study of fattening and meat characteristics of young pigs of different genealogical lines indicate that the animals of the Slavutich line outweighed the peers of the Chenghis line by 52.3 g average daily live weight gain (td = 3.98; P<0.001) live weight 100 kg – 7.1 days (td = 3,51; P<0,01), feed costs per 1 kg of live weight gain – 0,22 feed units (td = 4.38; P <0.001), the thickness of the spine at the level of 6–7 thoracic vertebrae – by 4.6 mm (td = 7.67; P<0.001), the area of the "muscular eye" – by 4, 1 $cm^2$ (td = 2.80; P< 0.01) (Table 2).

It was found that animals of the Slavutich line were also characterized by higher values of "length of chilled carcass, cm" (by 2.7, td = 3.03; P <0.01) and "mass of the back third of chilled half-carcass, kg (by 0.3, td = 1.07; P> 0.05).

The results of the pigs' fattening and fattening estimates using the A. Sazer - H. Fredin index are shown in Table 3.

The data obtained indicate that animals with a positive index value compared to their peers of the opposite group are characterized by higher average daily weight gain over the period of fattening from 30 to 100 kg (by 21.9 g, td = 2.35; P<0.05), a smaller fattening period (4.9 days, td = 3.79; P<0.001) and feed consumption per 1 kg of live weight gain (0.08 feed units, td = 2.22; P<0.05). The reciprocal pattern is determined by meat quality. The difference is in favor of animals with negative value of the index A. Sazer - H. Fredin in the length of the cooled carcass is equal to 1.2 cm (td = 1,79; P> 0,05), thickness of the spike at the level of 6–7 thoracic vertebrae – 2,0 mm (td = 3.17; P< 0.01), the area of the "muscular eye" – 1.6 $cm^2$ (td = 1.56; P> 0.05), the weight of the back third of the cooled half-carcass – 0.2 kg (td = 0.91; P>0.05).

Significant correlation was established between the A. Sazer - H. Fredin index and the indices "average daily weight gain for the period from fattening from 30 to 100 kg, g", "age of reaching live weight 100 kg, days", "feed consumption for 1 kg of weight gain, feed units", "thickness of the spine at the level of

***2. Feeding and meat qualities of young pigs of great white breed of different of different genealogies lines***

| Indicators, units | Biometric indicators | Genealogies lines | |
|---|---|---|---|
| | | Chenghis | Slavutich |
| Feeding qualities | | | |
| The average daily gain of live weight during the fattening period is 30 to 100 kg, g | n | 18 | 15 |
| | $\overline{X} \pm S\overline{x}$ | 680,1 ± 10,55 | 732,4 ± 7,84*** |
| | Cv ± $Sc_v$, % | 6,58 ± 1,096 | 4,14 ± 0,756 |
| Age of live weight 100 kg, days | $\overline{X} \pm S\overline{x}$ | 187,4 ± 1,62 | 180,3 ± 1,22** |
| | Cv ± $Sc_v$, % | 3,67 ± 0,611 | 2,62± 0,478 |
| Feed costs per 1 kg of weight gain, feed units | $\overline{X} \pm S\overline{x}$ | 4,14 ± 0,043 | 3,92 ± 0,026*** |
| | Cv ± $Sc_v$, % | 4,43 ± 0,738 | 2,56± 0,468 |
| Meat qualities | | | |
| The length of the cooled carcass, cm | n | 8 | 7 |
| | $\overline{X} \pm S\overline{x}$ | 94,5 ± 0,50 | 97,2 ± 0,74** |
| | Cv ± $Sc_v$, % | 2,27 ± 0,567 | 2,96 ± 0,791 |
| Thickness at 6–7 thoracic vertebrae, mm | $\overline{X} \pm S\overline{x}$ | 28,5 ± 0,46 | 23,9 ± 0,40*** |
| | Cv ± $Sc_v$, % | 6,92 ±1,730 | 6,60 ± 1,764 |
| Area of «muscular eye», $cm^2$ | $\overline{X} \pm S\overline{x}$ | 33,4 ± 0,53 | 37,4 ± 0,57** |
| | Cv ± $Sc_v$, % | 4,47± 1,117 | 4,07 ± 1,088 |
| Weight of the back third of the cooled half-carcass, kg | $\overline{X} \pm S\overline{x}$ | 10,2 ± 0,17 | 10,5 ± 0,23 |
| | Cv ± $Sc_v$, % | 4,95 ± 1,237 | 5,87 ± 1,569 |

** P<0,05. ** P<0,01. *** P<0,001.*

***3. Feeding and meat characteristics of young pigs great white breed of different breeds of distribution according to A. Sazer - H. Fredin index***

| Indicators, units | Biometric indicator | Value of index – A. Sazer - H. Fredin | |
|---|---|---|---|
| | | positive, (+) | negative, (-) |
| Feeding qualities, n = 15 | | | |
| The average daily gain of live weight during the fattening period is 30 to 100 kg, g | lim | 0,144 - 3,273 | −2,781 - −0,003 |
| | $\overline{X} \pm S\overline{x}$ | 722,5 ± 7,51* | 700,6 ± 5,51 |
| | Cv ± $Sc_v$, % | 5,40 ± 0,987 | 4,85 ± 0,886 |
| Age of live weight 100 kg, days | $\overline{X} \pm S\overline{x}$ | 181,3 ± 1,09*** | 186,2 ± 0,71 |
| | Cv ± $Sc_v$, % | 3,14 ± 0,574 | 2,35 ± 0,429 |
| Feed costs per 1 kg of weight gain, feed. units | $\overline{X} \pm S\overline{x}$ | 3,96 ± 0,028* | 4,04 ± 0,023 |
| | Cv ± $Sc_v$, % | 3,68 ± 0,672 | 3,55 ± 9,648 |
| Feeding qualities, n = 5 | | | |
| The length of the cooled carcass, cm | $\overline{X} \pm S\overline{x}$ | 95,7 ± 0,49 | 96,9 ± 0,46 |
| | Cv ± $Sc_v$, % | 2,67 ± 0,844 | 2,92 ± 0,924 |
| Thickness at 6–7 thoracic vertebrae, mm | $\overline{X} \pm S\overline{x}$ | 27,4 ± 0,50 | 25,4 ± 0,39** |
| | Cv ± $Sc_v$, % | 9,67± 3,060 | 9,58 ± 3,031 |
| Area of «muscular eye», $cm^2$ | $\overline{X} \pm S\overline{x}$ | 34,2 ± 0,88 | 35,8 ± 0,52 |
| | Cv ± $Sc_v$, % | 9,25 ± 2,927 | 6,07 ± 1,920 |
| Weight of the back third of the cooled half-carcass, kg | $\overline{X} \pm S\overline{x}$ | 10,3 ± 0,17 | 10,5 ± 0,15 |
| | Cv ± $Sc_v$, % | 6,07 ± 1,920 | 6,12 ± 1,936 |

** P<0,05. ** P<0,01. *** P<0,001.*

6–7 thoracic vertebrae, mm" and "area of the "muscular eye, $cm^2$" (table 4).

***4. Correlation coefficient between fattening and meat characteristics of young pigs great white breed and A. Sazer - H. Fredin evaluation index, n = 33***

| Signs | | Biometric indicators | |
|---|---|---|---|
| *x* | *y* | r ± Sr | Tr |
| A. Sazer - H. Fredin evaluation index | The average daily gain of live weight during the fattening period is 30 to 100 kg, g | 0,379 ± 0,1062*** | 3,57 |
| | Age of live weight 100 kg, days | -0,527 ± 0,0896*** | 5,88 |
| | Feed costs per 1 kg of weight gain, feed. units | -0,341 ± 0,1097** | 3,11 |
| | The length of the cooled carcass, cm | -0,135 ± 0,1218 | 1,10 |
| | Thickness at 6–7 thoracic vertebrae, mm | 0,528 ± 0,0894*** | 5,91 |
| | Area of «muscular eye», $cm^2$ | -0,296 ± 0,1132* | 2,61 |
| | Weight of the back third of the cooled half-carcass, kg | -0,061 ± 0,1236 | 0,49 |

** P<0,05. ** P<0,01. *** P<0,001.*

This indicates the effectiveness of the use of the evaluation index of A. Sazer - H. Fredin for the evaluation of young pigs for fattening and meat quality.

1. Young pigs of large white breed of the control herd are characterized by sufficiently high rates of fattening and meat quality. By the age of reaching 100 kg live weight, the length of the chilled carcass and the thickness of the pelvis at 6–7 thoracic vertebrae; they exceed the minimum elite requirements by an average of 5.92 %. Taking into account the linear identity of the animals, it was established that the youngest pigs of the Slavutich lineage are characterized by the maximum indices of these groups of traits.

2. The use of an evaluation index of A. Sazer - H. Fredin is an effective method of estimating young pigs large white breed and flock animals.

3. Correlation coefficients between the index A. Sazer - H. Fredin and the indicators "daily average weight gain for the period of fattening from feed from 30 to 100 kg, g", "age of reaching live weight 100 kg, days", "feed consumption for 1 kg weight gain, feed units", "thickness of the spine at the level of 6–7 thoracic vertebrae, mm" and "area of the "muscular eye", $cm^2$ "are reliable and range from -0.527 (P <0.001) to +0.528 (P <0.001 ).

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***Халак В. І. Індекс А. Сазера - Х. Фредіна та його використання при оцінці молодняку свиней за відгодівельними і м'ясними якостями.*** *Зернові культури. Т. 4. № 1. С. 179–184.*

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*Наведені результати досліджень показників відгодівельних та м'ясних якостей молодняку свиней великої білої породи різних генеалогічних ліній з використанням оціночного індексу А. Сазера - Х. Фредіна.*

*Встановлено, що молодняк свиней підконтрольного стада (ТОВ «Агро-Еліта» Дніпропетровської області) характеризується достатньо високими показниками відгодівельних і м'ясних якос-*

*тей. За віком досягнення живої маси 100 кг, довжиною охолодженої туші та товщиною шпику на рівні 6–7 грудного хребця молодняк свиней переважав мінімальні вимоги до класу «еліта» в середньому на 5,92 %.*

*Коефіцієнт кореляції між показниками «середньодобовий приріст живої маси за період відгодівлі від 30 до 100 кг, г», «вік досягнення живої маси 100 кг, діб», «витрати корму на 1 кг приросту живої маси, корм. од.», «товщина шпику на рівні 6–7 грудного хребця, мм» і «площа «м'язового вічка», см$^2$» та оціночними індексами коливається у межах від -0,527 (P<0,001) до +0,528 (P<0,001). Зважаючи на вищенаведене, пропонуємо в умовах племінних заводів і репродукторів, а також промислових комплексів оцінку молодняку свиней і тварин основного стада вести як за вимогами Інструкції з бонітування свиней, так і на основі оціночного індексу А. Сазера - Х. Фредіна.*

***Ключові слова:*** *молодняк свиней, порода, відгодівельні і м'ясні якості, оціночні індекси, мінливість, кореляція.*

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***Халак В. И. Индекс А. Сазера - Х. Фредина и его использование при оценке молодняка свиней по откормочным и мясным качествам.*** *Зерновые культуры. 2020. Т. 4. № 1. С. 179–184.*

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*Изложены результаты исследований показателей откормочных и мясных качеств молодняка свиней крупной белой породы разных генеалогических линий с использованием оценочного индекса А. Сазера - Х. Фредина.*

*Установлено, что молодняк свиней подконтрольного стада (ООО «Агро-Элита Днепропетровской области) характеризуется достаточно высокими показателями откормочных и мясных качеств. По возрасту достижения живой массы 100 кг, длине охлажденной туши и толщине шпика на уровне 6–7 грудного позвонка молодняк свиней превышал минимальные требования к классу «элита» в среднем на 5,92 %.*

*Коэффициент корреляции между показателями «среднесуточный прирост живой массы за период откорма от 30 до 100 кг, г», «возраст достижения живой массы 100 кг, дней», «затраты корма на 1 кг прироста живой массы, корм. ед.», «толщина шпика на уровне 6–7 грудного позвонка, мм» и «площадь «мышечного глазка», см$^2$» и оценочными индексами колеблется в пределах от - 0,527 (P <0,001) до +0,528 (P <0,001). В связи с этим предлагаем в условиях племенных заводов и репродукторов, а также промышленных комплексов оценку молодняка свиней и животных основного стада вести соответственно Инструкции по бонитировке свиней и на основе оценочного индекса А. Сазера - Х. Фредина.*

***Ключевые слова****: молодняк свиней, порода, откормочные и мясные качества, оценочные индексы, изменчивость, корреляция.*