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INNOVATIVE TECHNOLOGIES FOR PIG BREEDING AT THE FARM "ECOPHARM"

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This article presents the results of research on the effectiveness of the use of Mriya feeding units in the feeding of replacement sows with fermented homogeneous Fodder suspension compared to the dry feed mixes of the feed plant Agrozoosvit LLC with the addition of premix Nutrimin for pigs of the same age category.

The materials of the research were mixed fodder produced by Agrozoosvit LLC (Nova Kakhovka, Kherson region), fermented homogeneous fodder suspension prepared with the help of feeding unit Mriya produced by LLC Scientific and Production Center of the Academy of Engineering Sciences of Ukraine PMZ, replacement sows on fattening.

The subject of research was the feeding of animals, productivity and changes in the physiological state of pigs, the behavior of pigs, economic efficiency depending on the type of feeding (dry fodder, fermented homogeneous fodder suspension).

Absolute gain uder the traditional type of feeding with dry feed was 3.38 kg lower compared to the rare type of feeding with fermented homogeneous feed suspension.

The growth rate of the studied animals of the second group that consumed the rare food was 194.4% – 18.55% higher than that of the control group, which indicates a greater intensity in the growth of live weight in the animals.

On the basis of the cost-effectiveness of fodder used during the period under study, it was found that feeds prepared with the help of equipment developed by the scientific and production center of the Academy of Engineering Sciences of Ukraine Pidzemmetalozahist, are cheaper in comparison with the feeds of the feed plant of Agrozoosvit LLC by 18.6%, which significantly reduces the prime cost of the products obtained in the process of feeding.

Direct costs, as well as the prime cost per 1 kg of gain during fattening under the rare type of feeding compared to the dry one, also showed a positive result and appeared to be 19.25% and 18.34% lower.

For equal market price of 1 kg of live weight for the animals at the end of their breeding, the market value of one head, bred for a rare type of feeding, appeared at 0.84%, or 44 UAH higher. Total yield of 1 kg of live weight was by 4.15 UAH or 9.79% lower, which allowed us to additionally receive from marketing products obtained during fattening, 503.86 UAH of profit per head at the level of profitability of 69.23%.

Key words: *replacement pigs, mixed fodder, fermented homogeneous fodder suspension, fodder conversion, average daily gain.*

Кушнеренко В. Г. Інноваційні технології свинарства на фермі «Екофарм»

У статті наведено результати досліджень щодо вивчення ефективності застосування кормоагрегатів «Мрія» у відгодівлі ремонтних свиноматок ферментованою гомогенною кормовою суспензією в порівнянні з годівлею сухими комбікормами комбікормового заводу «Товариство з обмеженою відповідальністю «Агрозоосвіт» із додаванням премікса "Nutrimin" для свиней певної вікової категорії.

Матеріалом досліджень були комбікорм, вироблений товариством з обмеженою відповідальністю «Агрозоосвіт» (місце знаходження Каховка, Херсонської області), ферментована гомогенна кормова суспензія, приготовлена за допомогою кормоагрегату «Мрія» виробництва товариства з обмеженою відповідальністю «Науково-виробничий упроваджувальний центр Академії інженерних наук України «Підземметалозахист», ремонтні свиноматки на відгодівлі.

Предметом досліджень виступала годівля тварин, продуктивність і зміни фізіологічного стану свиней, поведінка свиней, економічна ефективність залежно від виду годівлі (сухий комбікорм, ферментована гомогенна кормова суспензія).

Абсолютний приріст за традиційним типом годівлі сухими кормами виявився на 3,38 кг нижчим у порівнянні з рідким типом годівлі ферментованою гомогенною кормовою суспензією.

Відносний приріст у дослідних тварин другої групи, які вживали рідкий корм, становив 194,4% – на 18,55% вище, ніж у тварин контрольної групи, що свідчить про більшу напруженість росту живої маси у тварин.

На основі собівартості кормів, використаних у дослідний період, визначено, що корми, приготовані за допомогою обладнання, розробленого науково-виробничим упроваджувальним центром Академії Інженерних наук України «Підземметалозахист», дешевші в порівнянні з кормами комбікормового заводу товариства з обмеженою відповідальністю «Агрозоосвіт» на 18,6%, що значно знижує собівартість продукції, отриманої в процесі годівлі.

Прямі витрати, як і повна собівартість на 1 кг приросту під час відгодівлі за рідкого типу годівлі в порівнянні з сухою, також показали позитивний результат і виявилися на 19,25% і 18,34% відповідно нижчими.

За рівної ринкової ціни 1 кг живої маси для тварин на кінець їх відгодівлі ринкова вартість однієї голови, відгодованої за рідкого типу годівлі, виявилась на 0,84% або 44 грн вищою. Повна собівартість 1 кг живої ваги була на 4,15 грн або 9,79% нижчою, що дозволило додатково отримати від реалізації продукції, одержаної під час відгодівлі, 503,86 грн прибутку на кожну голову за рівнем рентабельності 69,23%.

Ключові слова: *ремонтні свинки, комбікорм, ферментована гомогенна кормова суспензія, конверсія корму, середньодобовий приріст.*

Statement of the problem. The modern farming industry has a large vector direction of its management and one of these vectors is animal husbandry as a final product of production, which allows to recycle grain and fodder crops grown on the own fields into a valuable final product – milk and meat, which increases the economic efficiency of economic management.

Modern science identifies three factors that ensure the productive potential of animals. This is genetic aspect, external environment and physiologically necessary nutrition for animals. Obviously, the weakest link among them in modern domestic animal husbandry is the third one – animal feeding.

Feed accounts for up to 70% of the total cost of livestock production. Therefore, quality feeding based on satisfying the animals with the necessary level of live goods and nutritional elements is a guarantor of the quality and profitability of the end product.

Modern technology of fodder preparation, which provides easily accessible living resources for manifestation of genetic potential of productivity, is a reliable tool in this regard.

This technology combines the capabilities of many technological operations that need to be carried out to produce rare enzymatic feeds. For example: The equipment of many European companies cooks rare fermented fodder operationally, on separate units (grain preparation, heating, fermentation, mixer (homogenization)), feeding by

a separate pump. Each of them is equipped with separate electric motors, and additional electric power or gas is used for heating, during grain grinding, sawing cyclones equipment is used, during fermentation a separate fermenter is used.

Ukrainian domestic equipment performs all 5 technological operations at the same time, on one electric motor, without requiring separate equipment, in the hydro-fermenter, speeding up the term of preparation of fermented homogeneous feed mixture, and saving electricity.

Fodder units of series ACGSM "Mriya" in the conditions of production, while respecting the recommendations on the preparation of complete solution bags allow to save up to 25% of the feed and increase the productivity of animals by 15% in comparison with the traditional technology of feeding.

These results are achieved through physical and chemical processes that take place in the working body.

The essence of the influence of these processes on plant food, coarse and juicy feeds is the following: cellulose (cellulose), like starch, is a natural polymer and it turned out that these substances have the same structural lanes and, therefore, the same molecular formula $(C_6H_{10}O_5)$ n.

Cellulose and starch molecules have different structures.

Starch molecules have a linear or, more often, a loose structure, while cellulose molecules have only a linear structure. This explains why cellulose, which has a higher value of n, produces such fibrous materials as warp, lion, etc. Under cavitation influence long molecules of cellulose are torn off, they form loosened isometric structures, and a part of molecules undergo hydrolisis, as well as the starch, with creation of sugars. Generally, hydrolysis of cellulose can be expressed by the same equation as hydrolysis of starch: $(C_6H_{10}O_5)$ n + nH_2O - C = $C_5H_{12}O_6$ [1].

Research (S. Shestakova) [2] has established that the feed components disperse under the influence of cavitation (i.e., undergo intracellulite level) as well as heat (depending on the need – to the level of pasteurization or sterilization). As a result of the cavitation treatment improves the chemical and biological properties of the feed: neutralized anti-reservoirs, monosaccharides are released, protein is transferred into a more accessible for the intestinal tract of the animals.

The use of fodder units series AKGSM "Mriya" allows under the conditions of existing livestock farms to produce easily assimilated, homogenized, uncontaminated feed grain (wheat, oats, barley, millet, etc.), by-products of grain processing enterprises (maquilage, waste products of boron milling production).); by-products of grain processing enterprises (fly ash, waste boron grinding production); waste of sugarbeet, alcohol, brewing, starch, cheese producing industries; waste grain processing enterprises (mill offals, weeds and burdocks, floors, etc.).

Rare fodder, prepared with the help of AKGSM "Mriya" series feeders, can be used for the breeding of pigs, young great horned livestock (GHL), breeding of small horned livestock, active herd of GHL, as well as for jocks and geese.

Analysis of recent studies and publications. World statistics show that pork currently takes the first place among the production of various types of meat. It accounts for 37.3% of the total, but its value is rapidly declining. This is also due to the rapid increase in the production of poultry meat. However, the volume of pork production in the world is constantly growing. Currently, the annual production of pork is 118.4 million tons and the forecasts of FAO and other international institutions growth will continue. The volume of international trade in pork is also growing. Considering that the consumption of pork per capita in our country can

reach 30 kg, we will have to produce 1.26 million tons of products for the domestic market to satisfy such demand [3].

In the domestic practice of animal husbandry, the value of grain in industrial fodder is 75%, in the conditions of households – up to 82%.

The use of significant quantities of grain in feed production puts animal husbandry in dependence on its gross yield. In turn, it is influenced by weather conditions, crop yields, priorities of certain crops in the field, which are caused by commercial interests, foreign trade policy of the state and others [4].

That is why the scientific search of Ukrainian animal breeders is aimed at modern technological solutions to reduce the cost of fodder.

Studying the aspects of the pigs' year of life gives the possibility to dramatically increase their productivity, in particular for young pigs at maturity due to the scientifically based balance of diets based on the amount of energy and the amount of live and biologically active reagents [3; 4; 5]. However, even an optimally high level of energy is ordered by balancing the diet on the basis of biologically complete proteins at the expense of unremovable amino acids (lysine, methionine, cystine, tryptophan, treonin) macro- and micronutrients and biologically active reagents also do not ensure 100% realization of the yearly program if the grower does not pay due attention to the yearly systems [6; 7].

The feeding system in the modern sense is a complex of appropriate technologies that can be implemented due to the availability of appropriate equipment and compliance with analogous methods in the context of the reverse type of feeding. Nowadays two main types of pigs' feeding are distinguished: rare and dry.

It should be noted that while the advantages and disadvantages of dry feeding are more understandable for the Ukrainian producer, is felt a certain deficit of information about the rare feeding.

Therefore, among the main advantages of rare feeding is the possibility of using cheap inputs from the food industry. Considering that 70% of costs during the production of pork is associated with feed, the inclusion of cheap products in the composition of complete and balanced ration of pigs significantly reduces the value of production. For the feeding of pigs used waste dairy, brewing, cereal, flour industry, as well as the production of vegetable oils, bakery and confectionery products. Of course, foodstuffs from private residences, the safety of which is difficult to control, are forbidden for use.

Among other advantages of the rare type of feeding O. Kravchenko, V. Golov [6] established a significantly higher level of consumption of wet feed compared to dry feed (by 5% or more); reduction of conversion factor (up to 10%); increase in live weight increment up to 6%; faster achievement of the required live weight. Thus, at 210 days the live weight of the animals for the dry type of feeding was 95,29 kg, and for the rare type – 102,66 kg with the average growth of 71 to 210 days, respectively, 516 and 569 g.

For piglets after weaning, liquid feed is more suitable for their physiological needs than dry feed. Moreover, the components that make up the liquid diet (cereals, dairy products) contain lactic acid bacteria, which ferment the feed mixture, lowering its pH, thereby ensuring the preserving effect. Lactic acid prevents growth of pathogenic microflora in the feed. For example, studies on 320 farms in the Netherlands have shown that subclinical salmonellosis occurs 10 times less frequently among piglets raised on liquid feed than among piglets fed dry feed, and the incidence of collibacteriosis deaths decreases by 25% [8].

Fermented fodder contributes to greater retention of food, their digestibility and, therefore, to increased growth.

Rare feedings are considered particularly effective in the production of pigs, because this category of livestock accounts for the main consumption of feed, and this means that there is a significant potential in cost savings through the improvement of feeding technology.

Thus, in order to optimize the feeding and increase the efficiency of pig farms different feeding systems are used, which allow to reduce feed wastage and increase the productivity of the farm. The most advantageous in this respect is the use of rare feedings. For piglets after weaning, liquid feed is more suited to their physiological needs than dry feed. In addition, components included in the composition of liquid ration (cereals, dairy products) contain lactic acid bacteria, which ferment the feed mixture, lowering its pH and thus ensuring the conservation effect.

Statement of the task. The aim of the research was to study the effectiveness of using "Mriya" feed concentrators for breeding sows with fermented homogeneous feed suspension compared with the feeding of maintenance sows with dry feed mixes of "Agrozoosvit" Company with the addition of "Nutrimin" premix for pigs of the same age category.

In order to solve these problems, was carried out a scientific and management survey in the farm "EKOFARM" of the Gornostaevsky district of the Kherson region.

In accordance with the goal, the following tasks were carried out:

– was determined zoochemical composition of components of enzymatic homogeneous feed suspension prepared with the help of feeding unit "Mriya" for young pigs on the basis of the laboratory tests of DDEU of life and amino acid composition;

– the year-round quality of young pigs was examined with homogeneous feed suspension prepared with the help of "Mriya" feeding unit;

– was monitored the behavior of the studied groups of pigs during the feeding and after the feeding and were made the conclusions;

– has been determined a complex of productive properties of pigs, homogeneous feed suspension prepared with the help of feeding unit "Mriya" and standard fodder from "Agrozoosvit" Feed Plant with the addition of "Nutrimin" premix for pigs of certain age category;

– was estimated the economical efficiency of using enzymatic homogeneous feed suspension prepared with the help of feeding unit "Mriya" in comparison with the feeding of pigs with dry feed mixes from the feed mill of LLC "Agrozoosvit" with the addition of premix "Nutrimin" for the feeding of pigs.

In order to solve these tasks, was carried out a scientific and management survey by the group method (according to the methodology of V. Kovalenko) [9].

The scheme of the study is shown in Table 1.

Were formed two groups of animals of the Great White English breed of 21 heads each.

In the first (control) group, the animals were fed with standard fodder, which is used in the farming, balanced by generally accepted norms.

The other group (the studied one) received a diet of enzyme homogeneous feed suspension prepared with the help of feeding unit "Mriya" (Table 2, 3) similar to those accepted in the farm, – a typical fodder mix, and balanced by the general accepted norms.

Table 1

Scheme of the scientific and management survey

The show	Dry type of feeding	Rare type of feeding (fermented homogeneous fodder suspension)
Group	I – Group (Control)	II – Group (Preliminary)
Delivered on the road, goals	42	-
Age at the time of placement on the road, days.	29	-
Transferred to the year-end, goals	21	21
Age at the time of transfer to the rehabilitation, days	101	101
Control slaughter of heads in live weight: 120 kg	3	3
Carcasses were deboned with a live weight: 120 kg	3	3

Table 2

Fodder and feed mix yields for pigs, 30–55 kg (% per weight)

Component	Group I (control) Combined fodder SK - 26	Group II (doslidna) feedsumish
Barley	50,00	50,00
Wheat	27,00	27,00
Soybean meal	19,10	19,10
Premix	3,90	3,90
Totally	100	100
In 1 kg of mixed fodder is stored: exchange energy, MJ	13,07	13,07

Table 3

Fodder and feed mix yields for pigs, 30–110 kg (% per weight)

Component	Group I (control) Combined fodder SK- 31	Group II (investigated) feeds
Barley	37,00	37,00
Wheat	40,00	40,00
Soybean meal	20,00	20,00
Premix	3,00	3,00
Totally	100	100
In 1 kg of mixed fodder is stored: exchange energy, MJ	13,10	13,10

The animals were clinically healthy, analogous in gait, statute, age and live weight.

The conditions of keeping pigs in the animal house complied with current zooveterinary standards.

The duration of the research study was 84 days.

All piglets were individually groomed when they were separated from the sows and marked with different colored tags for each group with their individual numbers. Group I and II pigs were raised on the basis of a dry type of feeding. All the animals were kept in identical conditions, in one room in combined machines with a floor area of 26 ^{m2} each one, with a dry concrete coating. Each machine had 8 automatic water bowl made from nippel. The pigs were fed with complete feed purchased or produced at the feed mill, according to the scheme adopted by the farm: from 29th to 41st day pre-starter feed, with a gradual transition from 42nd to 46th day to the starter feed and 63rd to 77th day - to the grouser feed.

In the study the selected animals were firstly examined and examined by veterinary specialists. The animals in the study were fed with complete dietary mixtures produced by "Agrozoosvit" LLC according to physiological norms for animals of the same age, and fermented homogeneous feed suspension analogous to the composition of animal feed plant based on the recommendations of specialists of scientific and production center of the Academy of Engineering Sciences of Ukraine "Pidzemmetalozahist, equipment of which was used for preparation of fodder crops for rearing. Composition and life expectancy of the feed mixture and fodder are given in table (2, 3)

The intensity of pigs' growth was determined by the results of animal breeding (appendix "B") on the basis of which we calculated the absolute, average and positive growth, according to universally accepted methods [10].

Feed was consumed by the I and the II groups from feedings. The fodder was distributed manually by means of a bucket, and the feed was constantly kept in reserve. The system of microclimate maintenance, water treatment, and pus removal was the same for all groups of animals. Upon reaching the age of 101 years, the animals of groups I and II were individually conditioned and transferred to the breeding room, where they were kept in 21 animals under identical conditions in combined cubicles of 46 ^{m2} each one, with a dry concrete layer.

The holding period was identical.

The animals of the first group were fed with the dry type of feeding, and the feed was distributed manually by means of a feeding bucket, while the feed was constantly kept in place.

For rare feedings the feed was prepared by "Mriya" feeding unit and in the form of enzyme homogeneous suspension was transferred by grains to feedings. The ratio of dry components of the feed to water was 1:2. The feed was delivered to feedings in two portions per day in accordance with the schedule of feeding in the farm. When the animals reached the age of six months, they were individually hunted and three heads were selected from each of the two combined stations for the control slaughter.

The slaughtered animals were evaluated during the control slaughtering at the meat processing plant of Nova Kakhovka. For this purpose, according to the research schemes, were slaughtered a certain number of animals of each species category. For 12 years before slaughtering the pigs were kept without food, and water was stopped to be given 2 years before the start of slaughtering.

Slaughtered yield, morphometric indicators of carcasses and their morphological structure were determined by the generally accepted methods: Slaughtered yield (%), by M. Ivanov, as a percentage ratio of the carcass weight without internal organs to the before slaughtered live weight of the animal.

Morphometric indicators of carcasses were determined by the following measurements:

– length of the carcass (cm), from the front edge of the pelvic sprout to the front edge of the first bony ridge;

– thickness of the hairpin (mm), above 6–7 bony ridges, in the withers, at its thickest point and at the cross-section;

– area of the "barb" (cm2), by drawing the contour of the transverse section of the found back bone between the last breast and the first transverse ridge on the tracing paper and then identifying it with the help of applied programs;

– weight of the back third of the back of the back (kg), by the method of conviction.

The morphological structure of the carcasses was studied by capping the fat and fatty and bone tissues in each of them. The index of feeding qualities was calculated according to the formula of M. Berezovskiy [10].

Cost-effectiveness calculation of growing and rearing young pigs under different technological conditions was carried out according to the methodology of economic efficiency of use in the agricultural economy of scientific and research works, research and design works, new technology, vinahodiv and rationalization proposals [11]. Experimental data were processed by the method of variation statistics [9] using computer technology and MS Excel 2000 and Statistika V.5 applied software packages.The variability of differences between the animals of each study group for some characteristics was determined by means of the Standard Statistic-Fisher Table described by I.A. Oyvin (1960). The study adopted the following system of significance: $p < 0,05$; $p < 0,01$; $p < 0,001$.

Laying out the main material of the study. According to scientists [12; 13], the most physiological type of feeding for pigs is a rare type with hairiness of 60–70%. Recently, there is a tendency in industrial pig breeding to switch to the lean type of feeding, the share of which in some European countries today reaches 50–70% [14]. Dry feed is observed to be much more consumed by pigs than liquid feed and it complicates their hierarchical relations through a longer period of the feeding process. New feeding systems are currently being developed to minimize the negative effects of changes in feed composition and consistency [15]. One of them is the equipment developed and put into production by the scientific and production engineering center of the Academy of Engineering Sciences of Ukraine "Pidmetalozachist", which can smoothly change over time, It is able to feed animals with feed of various consistencies in multiphase mode with a smooth transition between feeds of any formulation [16], is quite cheap in comparison with similar equipment for fodder preparation, which significantly reduces the value of products obtained in the process of annualization.

Taking into account the world tendency to transition to a rare type of feeding, we conducted a comparative feeding of pigs up to six months of age for a different type of feeding, Table 4.

During the ageing of repair pigs up to six months there was a tendency to increase the live weight of the animals for a rare type of feeding with fermented homogeneous feed suspension.

Living weight of the first group (control) of pigs at the end of the year was higher – by 2.44 kg in a dry type of feeding (td = 1,95, with a standard value of 2,08). Thus the live weight at the end of the feeding differed in both types of feeding by 1 kg for the animals that were fed with enzyme homogeneous feed suspension.

Absolute gain by the traditional type of feeding with dry feed was 3.38 kg lower compared to the rare type of feeding with fermented homogeneous feed suspension.

Young animals grow nervously, so the indicator of absolute growth does not reflect the real intensity of growth processes, the degree of their tension, i.e. the relationship between the size of the body mass, which increases, and the speed of growth.

Table 4

Year-round performance of the repair pigs at the age of six months for different type of year-round (n=21), $\overline{X} \pm S_{\overline{x}}$

The show	The group of pigs and the type of feeding	
	I (control) dry	II (pre-test) Rare type of feeding (fermented homogeneous fodder suspension)
Live weight at staging, kg	43,14 ± 0,86	40,76 ± 0,86
Live weight at the end of the year, kg	119 ± 0,86	120 ± 0,86
Duration of duration, days	84 ± 0,86	84 ± 0,86
Age at discharge, days	185	185
Savings, %	100	100
Feed conversion, kg	2,61	2,78
Fodder consumption per head per day, kg	2,4	2,6
Absolute growth, kg	75,86	79,24
Average growth, g	0,904	0,941
Incremental growth, %	175,85	194,4
Age of reaching 100 kg weight, days	166	166

The growth rate of the studied animals of the second group that consumed rare food was 194.4%, which is 18.55% higher than that of the control group and indicates a greater tension in the growth of live weight in the animals.

The average gain also shows the superiority of the animals of the studied group over the animals that consumed dry food and is 0,037 g, but this difference is not significant.

Rare fodder is more privative for its tasty qualities and therefore the animals of the study group consumed it more than the control group animals as evidenced by the consumption of food per head per day and was higher by 0.2 kg, which in the result gave the advantage over the animals that consumed dry food.

Feed conversion was lower in the control group and amounted to 0.17 kg, this difference is not significant.

The time of reaching the live weight of 100 kg of both groups of pigs was 166 days, which indicates the balance of the feed and the same living value, regardless of the type of year.

The live weight at the time of withdrawal from the feeding differed between the dry and rare type of feeding by 1 kg, to the advantage of the animals that consumed the rare food during the feeding period.

When the pigs reached the age of six-months, their slaughter output was practically equal (Table 5). There was no significant difference in other slaughter indicators, although there was a tendency for the density of “lambs” to increase, carcass length and its bacon half and the weight of the back third of the filling, the thickness of the speck over the 6–7 thoracic ridge and the thickness of the fat on the rump in animals with a rare type of feeding.

The pre-slaughter weight of the selected animals of different types of age at the time of slaughter showed a significant difference in the average live weight and was 1,4 kg higher than that of the control group (td = 0,86, with a standard value of 3,18).

The slaughter weight was also 1 kg higher in the animals of the studied group, which were fed with fermented homogeneous feed suspension.

Table 5

Slaughtered pigs with different types of feedings at slaughter with a live weight of 120 kg, (n=3), $\overline{X} \pm S_{\bar{x}}$

The show	I control	The second survey.
Front weight, kg	119,2 ± 1,13	120,6 ± 1,16
Filling weight, kg	90,8 ± 0,86	91,8 ± 0,77
Outage, %	75,7 ± 0,52	76,4 ± 0,56
Skin thickness: over 6 - 7 thoracic ridges, mm	25,8 ± 0,74	26,4 ± 0,55
in the hold	42,3 ± 1,13	43,6 ± 1,07
on the kriegs	12,5 ± 0,88	12,8 ± 0,82
The area of the "mozovy vichok", cm^2	41,8 ± 1,02	42,6 ± 1,03
Length of the filling, cm	100,4 ± 1,07	101,8 ± 1,49
Length of bacon halves, cm	84,3 ± 1,03	85,2 ± 0,96
Weight of the back third of the filling, kg	13,8 ± 0,14	14,4 ± 0,17

The 0.7% slaughter rate was 0.7% higher in the repair pigs of the studied group, but this difference was inharmonious.

All of the following indicators showed a tendency to outperform the control group and had a low level of predictability.

The most precise and specific indicator, which characterizes the meat quality of pigs, is the morphological composition of the carcass and the proportion of individual tissues in it. As a result of its analysis, it is possible to obtain in-depth information about meat and fat quality of pigs and the influence on them of individual factors of technology and its components.

As a result, we carried out the culling of 3 carcasses from each group to determine their morphological structure. As a result, high indicators of carcass solidity were established (Table 6).

Table 6

Morphological structure of the carcasses of young pigs for a different type of year (n=3) $\overline{X} \pm S_{\bar{x}}$

The show	Dry type of feeding	A rare type of yearbook
Content (%) in the carcass: - meat	61,5 ± 0,28	62,6 ± 0,29
- lard	26,8 ± 0,14	26,1 ± 0,16
- kistok	10,0 ± 0,11	10,0 ± 0,11
Ratio of meat : bacon	2,29	2,39
The relationship between the meat and the bones	6,15	6,26

The analysis of the morphological structure of the carcasses of under study young animals with a live weight of 120 kg gave the following results. The absence of statistically significant difference between the volume of meat in the carcasses of both groups of pigs was established.

The amount of fat in the carcasses of pigs slaughtered for a live weight of 120 kg was slightly higher than in the animals of the dry type of feeding.

The correlation of meat: fat was 0.09 units worse compared to the control group and also appeared to be the best for a rare type of feeding.

The best ratio of meat to bone in the group with a rare type of feeding was also determined by the type of feeding.

Economical effect gained from the use of a rare type of feeding is calculated by the difference in the indicators of productivity of reproductive pigs. The base variant is the productivity of pigs using dry type of feeding during the feeding period, for the improved rare type of feeding, which we recommend for the feeding of pigs at the farm. The weight of the animals at the end of the period, aged six months and close to 120 kg was taken as the basis for the feeding.

As shown in Table 7, the fatality rate of one head of bred pigs varied, i.e. in the study group this indicator was 3.8% lower compared to the control group.

Due to the different intensity of growth of the studied animals caused by the types of feeding, the rare feeding had 3.38 kg (or 4.5%) more growth of body weight compared to the animals that were born with the dry feeding.

Direct inputs and total yield per 1 kg of growth during the year of the rare type of year, compared with the dry, decreased and were accordingly by 19.25% and 18.34% lower.

The market price of 1 kg of live weight for animals at the end of their breeding was 44 UAH per 1 kg of live weight. Market value of one head, widened for a rare type of feeding, was found by 0,84%, or 44 UAH higher. Due to the reduction of the total value of 1 kg of live weight by 5.84 UAH or 18.34%, received from the implementation of products during the feeding pigs earned 503.86 hryvnia more revenue, or 54.62% more.

Thus, the use of a rare type of feeding led to an increase in the profitability of feedings by 31.04%, compared with the dry type of feeding, and was 69.23%.

Table 7

Differences in economic indicators of productivity for dry and rare type of feeding on the year-end

The show	Type of year		± ridiculous to dry	± %
	dry	ridiculous		
Ownership of 1 goal at the beginning of the survey, UAH	2 628,88	2 528,92	-99,96	-3,80
Absolute growth, kg	75,86	79,24	3,38	4,50
Direct costs per 1 kg of growth during the year, UAH/kg	22,29	18,20	-4,09	-19,25
Total cost of 1 kg of growth, UAH/kg	31,84	26,00	-5,84	-18,34
Total yield of gained growth per 1 head during the year, UAH	2 415,38	2 060,24	-355,14	-14,70
Total value of 1 head at the end of the period, UAH	5 044,26	4 589,16	-455,10	-9,02
Weight of 1 head at the end of the period, kg	119,00	120,00	1,00	0,84
Total cost of 1 kg of live weight at the end of the period, UAH	42,39	38,24	-4,15	-9,79
Market value of 1 kg of live weight, UAH	44,00	44,00	-	-
Market value of 1 head at the end of the period, UAH	5 236,00	5 280,00	+44,00	0,84
Value of additionally received products per 1 head, UAH	3 337,84	3 486,56	148,72	4,45
Gain (loss "-") during the period of the year per head, UAH	922,46	1426,32	503,86	54,62
Profitability of the year-round production of 1 head, %	38,19	69,23	+31,04	x

Conclusions and suggestions. Fermented homogeneous fodder suspension prepared with the help of "Mriya" feeding unit was more readily consumed by the animals due to which the time of fodder consumption was two times shorter. The animals of the research group consumed less water during the period between feed distribution, the maintenance pigs of the research group were groomed and spent three times as much time for resting as the control group pigs that consumed dry feed.

During the ageing of repair pigs up to six months, there was a tendency to increase the live weight of the animals for a rare type of feeding with fermented homogeneous feed suspension.

The live weight of the first group (control) of pigs was higher – by 2.44 kg at the dry type of feeding. At the same time, the live weight at the end of the feeding differed in both types of feeding by 1 kg for the benefit of the pigs that were fed with enzyme homogeneous fodder suspension.

Absolute gain by the traditional type of feeding with dry feed was 3.38 kg lower compared to the rare type of feeding with fermented homogeneous feed suspension.

The growth rate of the study animals of the second group that consumed the rare food was 194.4% – 18.55% higher than that of the control group, which indicates a greater tension in the growth of live weight in the animals.

The live weight at the time of withdrawal from the feeding differed between the dry and rare type of feeding by 1 kg, to the advantage of the animals that consumed the rare food during the feeding period.

On the basis of the cost-effectiveness of fodder, used during the period under study, it was found that fodder prepared with the help of equipment developed by the scientific and production center of the Academy of Engineering Sciences of Ukraine "Pidzemmetalozahist", is cheaper in comparison with the feed of the feed plant of LLC "Agrozoosvit" by 18.6%, which significantly reduces the value of the products obtained in the process of annualization.

Direct costs, as well as the total yield per 1 kg of growth during the weathering for a rare type of feeding compared to the dry, also showed a positive result and appeared to be 19.25% and 18.34% accordingly lower.

For equal market price of 1 kg of live weight for the animals at the end of their breeding, the market value of one head, bred for a rare type of feeding, appeared at 0.84%, or 44 UAH higher. Total yield of 1 kg of live weight by 4.15 UAH or 9.79% was lower, which allowed to additionally receive from the implementation of products obtained during the feeding, 503.86 UAH earnings per head at the level of profitability of 69.23%.

On the basis of the above findings we recommend small and medium-sized pig farms to use innovative technologies to improve the economic level of management.

The use of this equipment as part of the technology of pork production in the farm is economically viable and led to an increase in profitability of feeding pigs by 31.04%, compared with the dry type of feeding and was 69.23%.

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