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## Influence of breeding pig breeding on efficiency production of the industry

Ibatullin M.<sup>1</sup> , Khakhula B.<sup>2</sup> 

<sup>1</sup>National University of Life and Environmental Sciences of Ukraine

<sup>2</sup>Bila Tserkva National Agrarian University



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The article considers the problems of development of breeding pig breeding in Ukraine as a basis for the functioning of efficient and competitive commodity production. According to the results of the study, with the reform of agricultural production, commodity pig farming suffered significant losses, which had a negative impact on the efficient operation of breeding farms, especially breeders.

The main reasons for the intensification of destructive phenomena in the field of breeding pig farming are the unstable level of purchase prices for pig products, low profitability and unprofitable production. It is obvious that the organization of the domestic selection system has a significant impact on reducing the cost and increasing the profitability of pig production, ensuring the quality and competitiveness of breeding (genetic) resources. The results of scientific research show that a significant increase in productivity in pig breeding is achieved through the effect of heterosis in interbreeding, and it is proved that under favorable conditions, the effect of crossbreeding is on average live weight gain of about 10-15% and feed payment 8- 10%. It is proved that to date there has been no clear pattern of a positive trend of change in the yield of piglets per sow in breeding pigs.

Analysis of the procedure for receiving funds under the state program for partial reimbursement of the cost of breeding animals purchased for further reproduction shows that in 2017 compensation for breeding pigs and boars of domestic origin ("elite" class) was 20% of the planned due to lack of state budget funds for appropriate measures. In 2018, this amount of compensation was increased to UAH 5,000 per head.

It was found that the unit cost of live weight of a breeding animal in 2017 was 2-2.5 times higher than in commercial pig farms. The high cost of production of breeding animals is due to higher feed costs due to components of the diet of mainly foreign production. It is obvious that the difficult financial situation determines the low investment attractiveness of the breeding pig industry for both domestic and foreign investors.

**Key words:** breeding pig breeding, animal productivity, breeding breeders, market dynamics, import of breeding pigs, production cost, state support programs.

**Problem statement and analysis of recent research.** Reforming Ukraine's economy in recent decades has been carried out without sufficient justification and assessment of possible consequences, which has led to a general economic crisis in the country, especially negatively affected the state of pig farming (disparity between prices for material resources and agricultural products significant increase in the cost of pig production and reduce its profitability) and its breeding component in particular, characterized by reduced demand for its products, disruption of ties between breeding and commodity farms of the corporate sector of the agricultural economy, which led to reduced efficiency.

In the current environment, it is necessary to search for reserves to increase the effective development of the pig industry by choosing the most effective ways to restore and increase the genetic potential of farm animals, revival of breeding plants and breeders, which will ultimately increase sales of pig products.

The following domestic and foreign scientists have devoted scientific works to the study of theoretical, methodological and practical principles of pig breeding development: Andriichenko V. [1], Berezovsky M.D. [2], Birta G.O. [3], Voitenko S. [4], Grebenik G. [5], Gun, U. [6], Zotko M. [7], Luchin I. [8], Mikityuk D. [9], Povod M.G. [11],

Torch G.S. [12], Ruban S.Yu. [14], Tikhomirov A.I. [15], Topikha V.S. [16], Fesenko V. [17] and others.

However, the researchers did not pay attention to the problems of breeding pig breeding as a basis for efficient commodity production of domestic pig products.

**The purpose of the study** is to develop practical recommendations for the revival of the functioning of breeding pigs, as a basis for effective development of pig production in Ukraine through the implementation of measures of state support for agricultural producers.

**Material and research methods.** During the scientific research general and special methods of research of processes and phenomena in their interrelation and development were used, namely: monographic (for formulation of the purpose, tasks and conclusions of research); method of comparative analysis (for research of the level of prices for domestic and imported products of breeding pig breeding); calculation-constructive, graphic (for comparison of indicators of economic efficiency of economic entities of commodity and breeding pig breeding).

**Results of research and discussion.** The results of research by domestic scientists show that the effectiveness of breeding work in pig breeding depends on the complex interaction of a number of organizational, economic and technological factors [17, p. 3].

During 2001–2017, there was a clear trend to reduce the number of breeding subjects in pig farming - breeding plants and breeders, which is a mirror image of the state of affairs in pig farming in the corporate sector of the agricultural economy of Ukraine (Fig.1).

It should be noted the rapid decline in the number of breeding breeders, which were structural units of specialized agricultural enterprises - producers of pig products.

It should be noted that during 2001–2017 the number of breeding plants did not decrease significantly. In our opinion, this circumstance is due to the fact that most of them are state-owned or are part of powerful vertically integrated associations for the production, processing and sale of pig products. Most of them focus on meeting the needs of farms in the corporate sector of the agricultural economy - members of the integration formation.

The main reasons for the intensification of destructive phenomena in the field of breeding pig farming are the unstable level of purchase prices for pig products, low profitability and unprofitable production. It is obvious that the organization of the domestic selection system has a significant impact on reducing the cost and increasing the profitability of pig production, ensuring the quality and competitiveness of breeding (genetic) resources.

We believe that in the current conditions, the primary condition for the functioning of competitive pig breeding in Ukraine is a qualitative aspect of the activities of breeding pigs, which will result in the number of sold breeding young. It is obvious that the decrease in the number of breeding plants and breeders is evidence of increasing market demands for the quality of breeding products, but only if proper feeding conditions are maintained, domestic pig farms will be able to provide industrial pig breeding with high quality genetic resources. Most breeding farms today are part of the corporation "Ukrvarinprom", namely: LLC

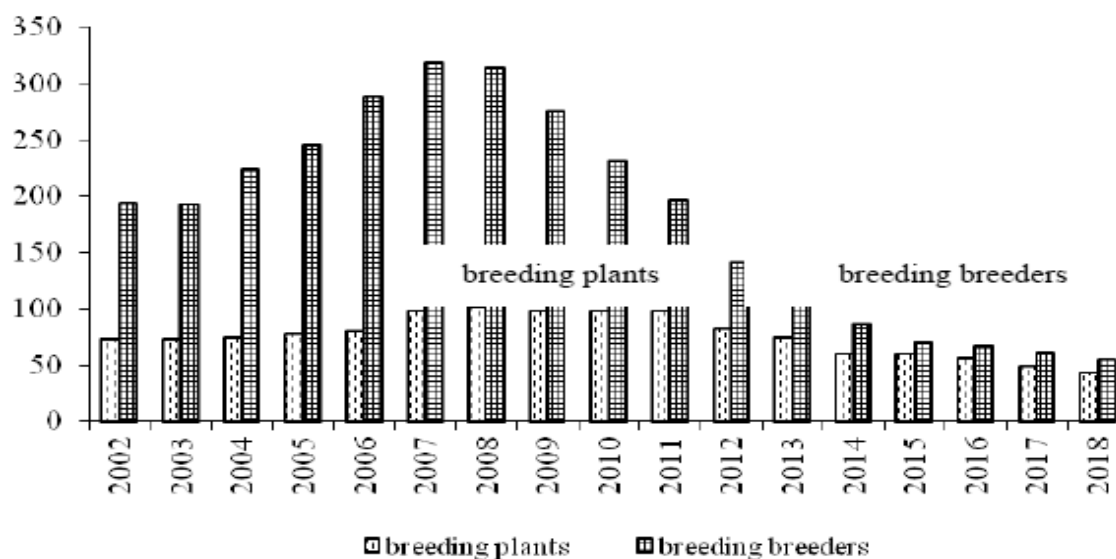


Fig.1. Dynamics of the number of breeding plants and breeders in pig breeding, units.

Source: compiled and calculated according to the Ministry of Agrarian Policy of Ukraine.

"Agroindustrial Company", LLC "Freedom Farm Bacon", LLC "Agro-Aries", LLC SPZ "Zolotonosha", LLC "Globinsky pig farm" and others.

Consider the peculiarities of the development of breeding pig enterprises in Ukraine. Thus, the ratio of sows in breeding and commercial herds does not meet the recommendations of scientists and practitioners developed in the pre-perestroika period, according to which in breeding plants they should be at least 5%, and in breeding breeders - 10% of the total sow population in the country. According to NAAS, the import of genetic resources in certain segments of the industry has already reached a critical level. It is 40% in pig farming, 62% in dairy cattle breeding, 100% in industrial meat poultry farming, and 84% in egg poultry farming [10]. In this regard, the opinion of the President of NAAS.

Existing methods for assessing the genotype of farm animals are based on the idea of the absolute adequacy of breeding value and productive qualities of animals [15, p. 23]. Thus, the instructions for grading farm animals identify features that have different selection value, priority and accuracy of assessment [13, p. 106]. There is no quantitative approach in the guidelines. Sows with elite class, first and second in fertility, differ from each other by 1 goal. However, all sows that gave birth to more than 11 piglets (for the first group of breeds) are classified as elite, although there is no doubt that the breeding quality of the two sows that gave birth to 11 and 22 piglets is different.

The most significant methodological shortcoming for grading is also the different accuracy of assessment of selection traits and their priority. Evaluation of pigs is based on the subjective idea of the identity of the selection weight of different selection traits in different evaluation systems. Thus, meat and fattening qualities in the general structure of evaluation of boars occupy 78.7%, constitutional features – 21.3%. It is necessary to point out the extremely low values of the reliability of the evaluation of sows by reproductive qualities (reliability criterion 0.33-0.50), which indicates a significant error of evaluation.

Evaluation of sows involves, in addition to the above features, the inclusion of the results of control fattening of piglets obtained from sows. In the structure of assessment, constitutional features occupy 37.5%, reproductive qualities – 21.4 and meat and fattening – 26.9%. They all have a low level of reliability. We share the position of scientists who emphasize that the productivity indicators for specialized breeds of pigs are too low and do not meet modern standards. Thus, precocity of 190 days or carcass length of 94 cm, provided for the elite class, do not meet the existing require-

ments [9, p. 127]. Given this, today there is a need to offer new methods for assessing the genotype of pigs, based on modern information technology, knowledge of the inheritance of quantitative traits, differentiated selection, involvement in the evaluation of all information about breeding animals, index selection.

According to the results of research on fattening and meat qualities of sow offspring in breeding pigs of Ukraine, there is a decrease in feed consumption per unit of growth, which indicates an increase in economic efficiency of their cultivation and fattening. However, the value of the feed consumption efficiency indicator significantly exceeds the normative value (2.45 quintals of feed per 1 quintal of growth), which gives reason to believe that the potential of animals is incomplete, which ultimately causes the loss of the industry.

It should be noted that there is a decrease in the thickness of lard at the level of 6-7 thoracic vertebrae during the study period as a whole for all subjects of breeding pigs by almost 20%, and in 2017 the value of this indicator was 23.7 mm (table 1).

The calculations in Table 1 show that during the analysis period there is a reduction in the time interval in reaching a live weight of pigs 100 kg as in breeding plants - in 2017 compared to 2005 it decreased by 22 days and in 2017 amounted to 184 days, and in breeding breeders - decreased by 28 days and in 2017 amounted to 186 days. Thus, this indicator is one of the resulting indicators of pig productivity, and its decline indicates a positive trend.

According to the calculations of scientists, profitable pig farming in agricultural enterprises will be for a duration of 170 days or less to obtain 100 kg of live weight for growing and fattening [5, p. 31]. Thus, if earlier in domestic pig farms the achievement of live weight of 120 kg within 240-260 days was considered an acceptable result, now the agricultural enterprise, which has formed a breeding stock with highly productive genetics, achieves such results in 170-180 days, thereby significantly reducing the duration. technological cycle of production and increasing efficiency indicators.

The situation with the assessment of indicators of fattening and meat qualities of boar offspring and repair young stock is ambiguous. It is proved that during the studied period there is no clear pattern of a positive trend of change in the yield of piglets per sow in breeding pigs (Fig. 2).

It should be noted that in comparison with the leading foreign producers of breeding pig products, the yield of piglets is extremely low. According to primary sources, the yield of piglets per sow in European countries is 14-15 piglets per farrowing.

Table 1 – Dynamics of indicators of fattening and meat qualities of offspring sows in breeding pigs of Ukraine

Year	Feed costs per 1 kg of gain, feed. from	Fat thickness at the level of 6-7 thoracic vertebrae, mm	The length of the carcass, cm	Age of reaching live weight 100 kg, days
2005 - total	4,40	29,2	90,0	210
have incl. breeding plant	3,73	30,0	87,6	206
Playmaker	4,96	28,3	93,6	214
2010 - total	3,69	23,3	96,1	201
have incl. breeding plant	3,46	23,1	96,5	200
Playmaker	3,94	23,8	95,6	202
2015 - total	3,66	19,1	96,6	195
have incl. breeding plant	3,31	17,9	97,4	194
Playmaker	4,30	23,6	94,9	198
2016 - total	3,43	20,9	97,1	193
have incl. breeding plant	3,16	16,6	96,8	190
Playmaker	3,52	26,1	98,1	197
2017 - total	3,52	23,7	98,0	185
have incl. breeding plant	3,29	20,9	98,6	184
Playmaker	3,60	25,0	97,9	186
2017,% to 2005 - total	80,00	81,16	108,89	88,1
have incl. breeding plant	88,20	69,67	112,56	89,3
Playmaker	72,58	88,34	104,59	86,9
2017,% to 2016 - total	102,62	113,40	100,93	95,9
have incl. breeding plant	104,11	125,90	101,86	96,8
Playmaker	102,3	95,8	99,8	94,4

Source: compiled and calculated according to the Ministry of Agrarian Policy of Ukraine.

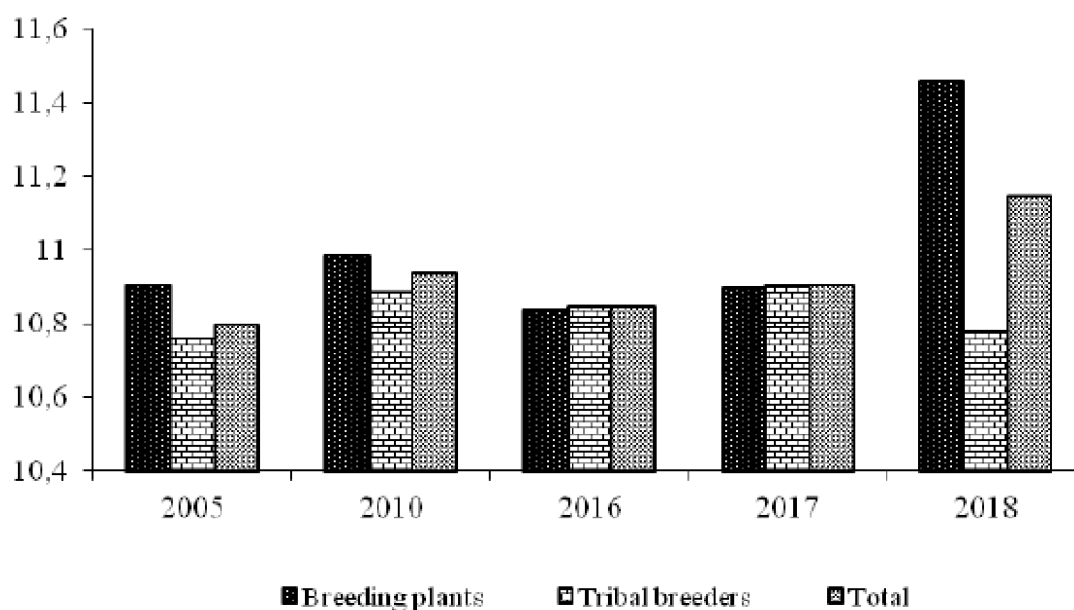


Fig. 2. Dynamics of yield of piglets per 1 sow in the subjects breeding pig breeding, ch.

Thus, according to the experience of leading producers of pig products, multiple births directly affect the cost of piglets and Danish genetics in these indicators in 1st place in the world.

Summarizing the root causes of low indicators of fattening, meat reproductive qualities of breeding pigs in Ukraine, in addition to the inconsistency of certain technological and economic parameters, an important deterrent can be noted a large number of breeds of pigs.

Breeds of pigs for grading (comprehensive assessment of productive qualities at an early age and determination of further economic purpose) of animals are divided into three groups. The first group includes universal breeds that combine high reproductive capacity with good fattening and meat qualities. The second includes breeds, specialized types and lines of meat and bacon pigs. The third group consists of rocks of the sebaceous direction of productivity [11, p. 74].

We believe that this breed composition made it possible for pork production to adapt to different conditions of keeping and feeding, to introduce different systems of crossing and hybridization, to support the rock-forming process. To confirm the above, it should be recalled that the Ukrainian meat breed was obtained according to a unique scheme - by a complex reproductive stepwise crossing using the 11 best domestic and foreign genotypes [2, p. 37].

However, domestic genotypes generally do not allow to reorient to the rapid growth of large volumes of pig production and its sale at affordable prices. In this regard, the opinion was spread among scientists about the possible threat to the production of pig slaughter products, including lard in Ukraine [9, p. 127].

It is known that at the beginning of 2000 there were up to 15 genetic centers in the world, the breeding products of which came to Ukraine. However, over the past 20 years, competition among them has intensified, so the weaker ones, unable to withstand it, left the market. One of the necessary conditions for the development of such centers is strong financial support for the activities of the departments of research and strategic development (R&D research and development) in the amount of at least 20-25 million dollars. USA every year. Thus, the need for investment is too great, and investors can feel the return on investment in 3-5 years. Instructive in this direction is the experience of Topigs Norsvin (Denmark), whose annual research budget is 21 million euros per year [8, p. 62].

In addition to genetic indicators of evaluation of breeding products, economic indicators are important in the activities of farms, in particular

profitability, the value of which is influenced by price and cost.

However, world experience and domestic practice of purchasing breeding young animals convince of the inexpediency of importing mother breeds of pigs and their crossbreeds. According to research results, 40% of repair pigs were culled before the first farrowing, and the remaining 70% left the herd due to disease, weakened constitution, poor adaptation, low productivity during the year [14, p. 10].

It should be noted that during the study period there was an increase in the price of imported pigs by 57.5%, which in 2017 amounted to 128,303.8 UAH / t live weight. This circumstance is primarily due to the devaluation of the hryvnia against the world's leading currencies, which has led to an increase in the value of imported animals.

In order to intensify the purchase of breeding pigs of both domestic and foreign selection, a state program was introduced to partially reimburse the cost of purchased for further reproduction of breeding animals. Analysis of the procedure for obtaining funds under this program shows that in 2017, compensation for breeding pigs and boars of domestic origin ("elite" class) was 20% of the planned due to lack of state budget funds for appropriate activities.

In 2018, the procedure for obtaining funds was simplified, in particular, in relation to the breed trait and place of purchase. The amount of compensation, which in the analyzed period is for breeding pigs and boars up to UAH 5,000 per head, has been significantly increased. This circumstance contributed to the growth of purchases of breeding animals in the amount of 4957 heads in the amount of 23461 thousand UAH, or 4733 UAH / head.

An important component that determines the efficiency of production and sale of pig products is the cost of 1 quintal. live weight of pigs on rearing and fattening, which reflects both qualitative and quantitative components of the technological process.

During the study period, there is an increase in the cost of live weight of agricultural enterprises - producers of marketable and breeding products of pigs (Fig. 3). This circumstance is evidence of the manifestation of inflation in the country's economy.

During the study period, there is a significant difference, which is primarily due to the technological features of the breeding and breeding pigs, which is determined by production goals. Thus, in commercial agricultural enterprises for feeding pigs use in the diet of feeding feed, which significantly increases the payback of feed, but nega-

tively affects the reproductive functions of farm animals.

An important indicator that characterizes the efficiency of production and sale of breeding products is the level of profitability.

During 2011–2017, there was a small level of profitability, which provides only a simple reproduction (Fig. 4).

In our opinion, the main factor causing this situation is the low level of purchase prices. Today, most breeding entities sell breeding pigs as marketable pigs, which is primarily due to sales problems.

This circumstance is due primarily to a decrease in the number of small and medium-sized farms in the corporate sector of the agricultural economy - producers of pig products, which focused on domestic producers of breeding products.

Highly concentrated agricultural enterprises focus mainly on foreign producers of breeding pigs, as part of the technology of pig production. When choosing genetics, producers usually focus on the following factors: productivity, quantity and quality of piglets born, growth rate, feed conversion, carcass premium for slaughter and others; ease of working with genetic material; the health

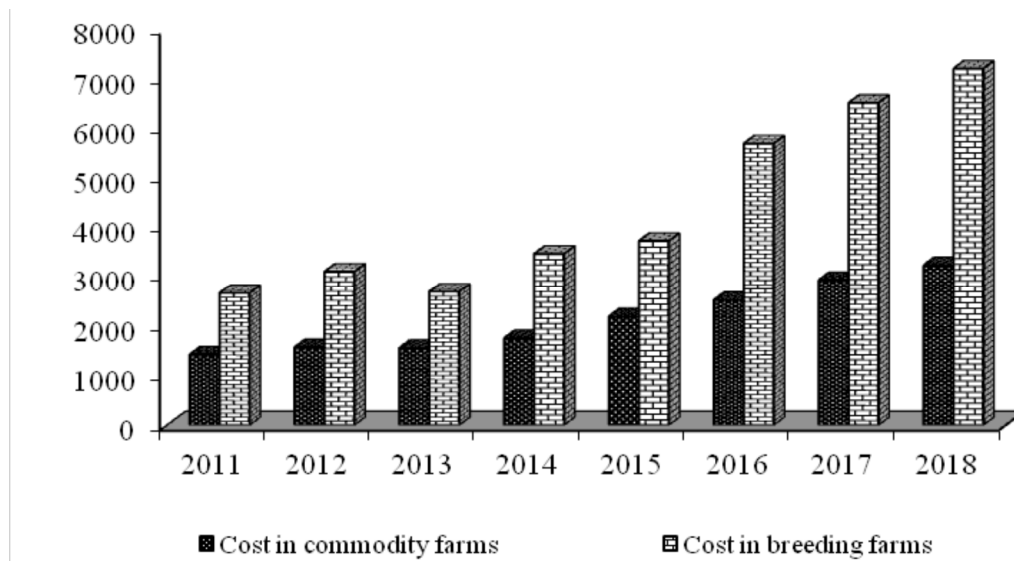


Fig. 3. Dynamics of the cost of 1 quintal of live weight in breeding and commodity agricultural enterprises-producers of pig products, UAH/s.

Source: compiled and calculated according to the Ministry of Agrarian Policy of Ukraine.

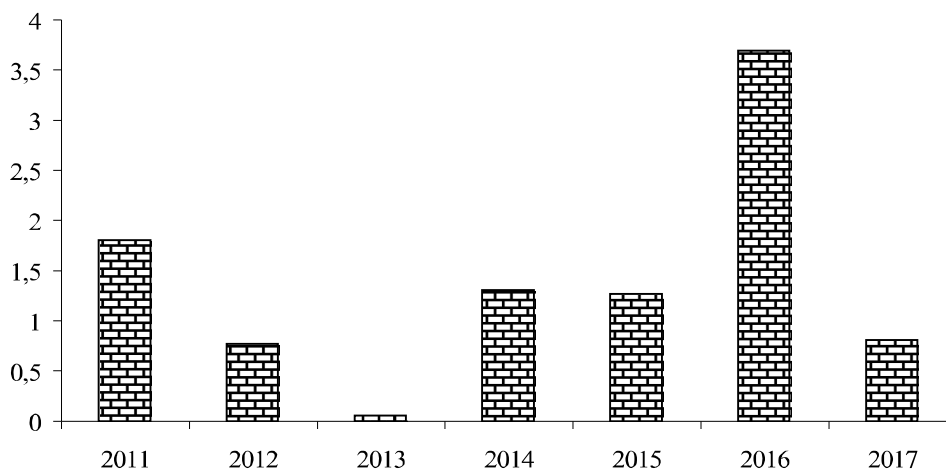


Fig. 4. Dynamics of profitability of production and sales breeding pigs, %.

Source: compiled and calculated according to the Ministry of Agrarian Policy of Ukraine.

of the genetic material (it must be at a high level, as it also affects the total cost of farmed pork).

Problems with the sale of breeding pig products in business entities is caused by a decrease in the amount of profit from the sale of breeding pig products and its share in the structure of the financial result of the studied breeding plants and breeders (Fig. 5).

Currently, most breeding plants are in the process of diversification of production and economic activities, focusing on the production of crop products and commercial pig farming. This circumstance is due to a significant number of objective and subjective reasons. However, in our opinion, the main one is the high risk of breeding pig production, which is primarily due to unforeseen changes in the legal framework for doing business and the lack of qualified specialists who have modern methods of genetics and breeding in pig breeding.

**Conclusions.** Summarizing the trends in the development of agricultural enterprises for the production of breeding pig products, it is possible to systematize the restraining factors of their effective development: reducing the demand of producers for breeding products due to the difficult financial situation; price disparity between pig products and inputs, feeds, medicines and other products, as well as services; violation of cooperative ties for

the production and sale of breeding products; reducing the level of state support for their innovative support; deterioration of the system of organizational and economic conditions of management.

Effective use of available genetic resources and creation of new perspective breeds, hybrids of pigs; technical re-equipment of the industry is the main prerequisite for the successful development of breeding and pig breeding in general.

The industry needs a new agricultural policy that takes into account the real state of pig farming and breeding, able to develop a mechanism of action to create the necessary production environment. Since the country's economy in modern conditions is not able to fully subsidize agriculture in general and the pig industry in particular, we need a stable system of liberalization of production and distribution of logistical and genetic reserves, the development of market mechanisms of self-financing and self-sufficiency. It is also necessary to restore a holistic economic and technological chain that ensures the implementation of the full cycle of breeding products, from reproduction to sale, including abroad. It is necessary to adopt a single state program for the development of breeding, which identifies the priority areas of development, the choice of promising critical technologies and the definition of priorities, taking into account the needs of the local market and international trends.

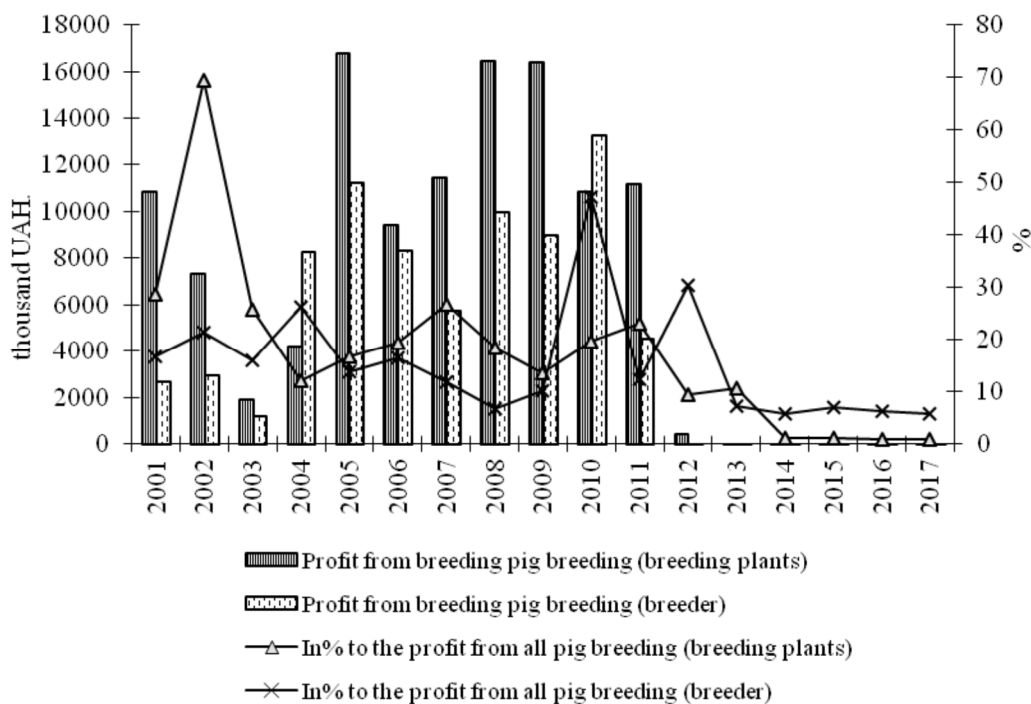


Fig. 5. Dynamics of profit from breeding pig breeding and its share in the total profit of pig breeding.

Source: compiled and calculated according to the Ministry of Agrarian Policy of Ukraine.

Among the priority measures for the development of breeding pigs it is necessary to: adopt a special legal act on the preservation and further development of the gene pool of created breeds of farm animals in the country; to create a bank of sperm and embryos of highly productive breeds and hybrids of pigs and to develop the complex program of its use; to organize a single computer accounting of highly productive breeding animals; consider the issue of state support for breeding plants; to create an experimental infrastructure for breeding pedigree livestock breeds of pigs; create conditions for the implementation of research and development in production and agricultural practice; to carry out breed recalculation of pigs and the account of available breeding genetic resources.

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#### Вплив племінного свиначарства на ефективність виробництва продукції галузі

Ібатуллін М.І., Хахула Б.В.

В статті розглядаються проблеми розвитку племінного свиначарства в Україні, як основи функціонування ефективного та конкурентоспроможного товарного виробництва. За результатами дослідження, з реформуванням сільськогосподарського виробництва значних втрат зазнало товарне свиначарство, що негативно позначилось і на ефективній діяльності племінних господарств-племзаводів, особливо племрепродукторів.

Основними причинами посилення деструктивних явищ у галузі племінного свиначарства є нестабільний рівень закупівельних цін на продукцію свиначарства, низька доходність і збитковість її виробництва. Очевидно, що на зниження показника собівартості та підвищення рентабельності виробництва продукції свиначарства, забезпечення якості та конкурентоспроможності племінних (генетичних) ресурсів суттєво впливає організація вітчизняної системи селекції. Результати наукових досліджень переконують, що істотне підвищення продуктивності у свиначарстві досягається за допомогою ефекту гетерозису за



міжпородного схрещування, при цьому доведено, що за сприятливих умов ефект від схрещування в середньому становить за показником приросту живої маси приблизно 10–15 % і за оплатою корму 8–10 %. Доведено, що до сьогодні не простежувалося чіткої закономірності щодо позитивної тенденції зміни виходу порослят на одну свиноматку в підприємствах племенного свинарства.

Аналіз порядку отримання коштів за державною програмою по частковому відшкодуванню вартості закуплених для подальшого відтворення племінних тварин свідчить, що 2017 р. компенсація за племінні свинки та кнурці вітчизняного походження (класу «еліта») становила 20 % від запланованого через відсутність коштів державного бюджету на відповідні заходи. У 2018 р. дану суму відшкодування збільшено до 5000 грн за голову.

Встановлено, що показник собівартість одиниці живої ваги племінної тварини в 2017 р. був у 2–2,5 рази вищим ніж у господарствах товарного свинарства. Висока собівартість виробництва племінних тварин зумовлена більшими витратами на корми через складові раціону годівлі переважно іноземного виробництва. Очевидно, що складна фінансова ситуація зумовлює низьку інвестиційну привабливість галузі племенного свинарства як для вітчизняних, так й іноземних інвесторів.

**Ключові слова:** племенне свинарство, продуктивність тварин, племінні репродуктори, динаміка ринку, імпорт племінних свиней, собівартість продукції, державні програми підтримки.

#### **Влияние племенного свиноводства на эффективность производства продукции отрасли**

**Ибатуллин М.И., Хахула Б.В.**

В статье рассматриваются проблемы развития племенного свиноводства в Украине, как основы функционирования эффективного и конкурентоспособного товарного производства. По результатам исследования, с реформированием сельскохозяйственного производства значительные потери понесло товарное свиноводство, что негативно отразилось и на эффективной деятельности племенных хозяйств-племязаводов, особенно племрепродукторов.

Основными причинами усиления деструктивных явлений в области племенного свиноводства называют

нестабильный уровень закупочных цен на продукцию свиноводства, низкую доходность и убыточность ее производства. Очевидно, что на снижение показателя себестоимости и повышение рентабельности производства продукции свиноводства, обеспечения качества и конкурентоспособности племенных (генетических) ресурсов существенно влияет организация отечественной системы селекции. Результаты научных исследований убеждают, что существенное повышение производительности в свиноводстве достигается с помощью эффекта гетерозиса по межпородному скрещиванию, при этом доказано, что при благоприятных условиях эффект от скрещивания в среднем составляет по показателю прироста живой массы примерно 10–15 % и по оплате корма 8–10 %. Доказано, что до сегодня не наблюдалось четкой закономерности относительно положительной тенденции изменения выхода порослят на одну свиноматку в предприятиях племенного свиноводства.

Анализ порядка получения средств по государственной программе по частичному возмещению стоимости закупленных для дальнейшего воспроизведения племенных животных свидетельствует, что в 2017 году компенсация за племенные свинки и кабанчики отечественного происхождения (класса «элита») составляла 20 % от запланированного из-за отсутствия средств государственного бюджета на соответствующие мероприятия. В 2018 данную сумму возмещения увеличено до 5000 грн за голову.

Установлено, что показатель себестоимости единицы живого веса племенного животного в 2017 г. был в 2–2,5 раза выше, чем в хозяйствах товарного свиноводства. Высокая себестоимость производства племенных животных обусловлена большими затратами на корма через составляющие рациона кормления преимущественно иностранного производства. Очевидно, что сложная финансовая ситуация обуславливает низкую инвестиционную привлекательность отрасли племенного свиноводства как для отечественных, так и иностранных инвесторов.

**Ключевые слова:** племенное свиноводство, продуктивность животных, племенные репродукторы, динамика рынка, импорт племенных свиней, себестоимость продукции, государственные программы поддержки.



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Ibatullin M.  
Khakhula B.

ID: <https://orcid.org/0000-0001-8765-6261>  
ID: <https://orcid.org/0000-0003-4286-2381>