

INNOVATIVE DEVELOPMENT OF SWINE BREEDING IN RUSSIA AND BELARUS ON A NEW TECHNOLOGICAL LEVEL

Vladimir Samosjuk, Vasilij Gutman, Vadim Kitikov
Republican Unitary Enterprise «Scientific-practical center of the National academy
of sciences of Belarus for agricultural mechanization»
Knorin str., 1, 220049, Minsk, **BELARUS**
E-mail: naunuka@tut.by

Swine breeding of Russia and Belarus has entered in qualitatively new stage of the development which prominent feature is introduction of innovative technologies and the best world achievements.

Within the limits of realisation of the priority national project it planned to construct and reconstruct 272 objects of swine breeding which input will allow to finish pork manufacture in the country by 2012 to 3 million tons in lethal weight.

As of October, 1st of current year the livestock of pigs in all categories of economy has made 17.6 million goals that on 4.2 million goals more than was in predesigned in 2005. In 2007 it has been realized on slaughter of pigs of 2.5 million tons in live weight, that on 482 thousand tons or on 24 % there is more than level of 2005. For 9 months this year realization on slaughter of pigs has increased by corresponding period of previous year on 7.7 %, in agricultural productions – on 13.5 %.

At the same time, in volume of realization of cattle and a bird on slaughter pork occupies today 29 %. Pork consumption per capita makes 18 kg a year, including at the expense of own manufacture only 13 kg. Pork is in the world on the first place on consumption among all kinds of meat. In the countries of Europe this indicator above 40 kg. The modern genetics should become a defining link of new swine breeding system, such qualitative characteristics as health, growth rate, fast meat, multiple pregnancy, stress resistance are defined in a solving measure in genetic potential of male pigs and a swine uterus.

All modern genetics is under construction on growth of this genetic potential of each animal and herd as a whole. The genetics has stepped over narrow borders of separate economy and is conducted by the largest genetic companies of the world and copes in the majority of the countries at the state level.

Therefore the modern genetic centers which problem to be engaged in reproduction of thoroughbred animals should be created, to increase genetic potential of thoroughbred herds and to make for commodity economy 2 pedigree swine and high quality male pigs of the third breed, as much as possible to use effect of heterosis from 3, and is possible and 4 linear hybridizations.

Throughout 15 years a livestock of agricultural animals and meat manufacture in Russia steadily decreased. So in 1992 in the country it has been made 8.26 million tons of meat of all kinds, and in 2004 this indicator has made only 5.1 million tons. Thus number of a livestock of pigs has decreased with 35.4 to 17.3 million goals.

On pork consumption per capita Russia and Belarus essentially lag behind the leading countries of the world. This indicator, including and pork import, has decreased in Russia by 2003 to 17.5 kg at 24 kg in 1990 (in the EU countries – 43 kg at 74 kg in Denmark), and in Belarus – to 30 kg and is at insufficient level.

Russia after 1990 became the large importer of meat, including pork. And, the low price level in the world on meat, characteristic in 1999–2000, was replaced by their essential growth last years that is connected with decrease or cancellation of the state grants to manufacturers and exporters of meat in the EU countries. Unfortunately in both countries were used extensive technologies (Table 1). Expenses of forages for additional weight centner (in 1.5–2.5 times above are high than abroad), inefficient use of a uterus, is not optimum live weight of the animals realised on slaughter, breeds of animals with low genetic potential are used, is low science capacity manufactures etc.

Table 1. Technological level of Russia and Belarus swine breeding in comparison with some countries of the world

Indicators	Denmark	France	Holland	Germany	Russia	Belarus
Exit of business pigs on one sow in year	21.9	21.0	22.6	20.2	13.32	16.7
Indicators of pigs fattening						
A daily average gain, g/days	778	746	770	677	350	476
Forage conversion on 1 kg of an additional weight, kg/kg	2.76	2.96	2.64	3.1	7.9	5.0
A case, in % to a herd turn	3.2	3.8	2.4	2.8	10.7	7.8
A lethal exit, %	76	77	77	79	63	65

As a whole in Belarus in all categories of economy, including personal economy of citizens contained a livestock of pigs from 5.204 million goals in 1990 to 3.287 million in 2004.

Now in Belarus 107 complexes on cultivation and pigs fattening with capacity from 12 to 108 thousand pigs fattening goals in a year, from them 3 complexes – on 108 thousand goals, 5 – on 54 thousand goals, 46 – on 24 thousand goals and 46 – on 12 thousand pigs fattening goals in a year, 7 hybrid centres on cultivation of 54 thousand pigs operate. 27 pig-breeding farms with the industrial “know-how” and pigs fattening from 3 to 6 thousand goals a year besides, operate.

Existing capacities of complexes are calculated on 310 thousand manufacture t of pork (or 3.1 million goals in weight of 100 kg) in a year, and 64 % from a designed capacity were made in 2002 198 thousand t. On swine breeding complex now it is grown up and fattened more than 80 % of all livestock of pigs of public sector: agricultural production co-operatives and state enterprises.

In spite of the fact that in swine breeding branch for 7 years since 1990 for 1997 has decreased productions on 37 %, since 1998 lifting of branch and manufacture has begun has increased by 2004 to 68 % to level of 1990 (Table 2).

Table 2. Number of complexes on manufacture of pork and use of their capacities

The areas name	In total	Including on capacities					Pork manufacture in year, thousand tons		
		108 thousand goal.	54 thousand goal.	24 thousand goal.	12 thousand goal.	SGC	Under the project	Actually for 2002	In % to the project
The Brest reg.	11	1	3	3	3	1	53	32.8	62
The Vitebsk	22	-	1	11	9	1	62	38.5	62
The Gomel reg.	11	1	1	4	4	1	40	29.2	73
The Grodno reg.	28	-	-	17	10	1	66	41.8	63
The Minsk reg.	22	1	-	9	10	2	65	38.5	59
The Mogilyov	13	-	-	2	10	1	24	17.1	71
On republic	107	3	5	46	46	7	310	197.9	64

Such tendency is connected, first of all by that swine breeding is better than other branches of animal industries is adapted for specialization and concentration of manufacture, high level of mechanization, providing lower expenses of forages and other material means for manufacture of a unit of production and fast returning of capital investments.

On earlier constructed complexes the technology of the maintenance and cultivation of pigs provided expenses of forages for manufacture of one kg of an additional weight 4.7–5.8 per unit, on 1 head in a year of the electric power – 65–70 kW per hour, thermal energy – 0.6–0.8 Gcall and waters – 3.9–4.0 m³. New technologies allow to lower specific expenses accordingly to 3.5–4.0 feeding units, 45–50 kW per hour, 0.3–0.35 Gcall and no more than 2.5 m³ water and to solve environmental problems in conducting zones swine breeding.

1. The basic directions of modernization of swine breeding branches and prognosis parameters

During the forthcoming period of an intensification of branch in a priority order it is necessary to carry out a complex of measures on working out and mass development of the technologies based on knowledge of a domestic and foreign science and the advanced practice.

Reconstruction and technical re-equipment of the pig-breeding enterprises of industrial type should be based on the new technologies realizing mutual adaptation of biological and technological links, genetic fullest display genetic and physiological potential of an organism of an animal.

Reconstruction and technical re-equipment should pursue the aim not only replacements of the physical and morally worn out equipment, and creation of new systems of comfortable conditions of a food and the maintenance of animals so that during production to reach standard parameters of efficiency of animals.

The main criteria of technological modernization by 2010:

- ♦ labor productivity in branch to increase in 1.7–2.0 times;
- ♦ operational costs on gain center to lower in 1.5–1.6 times.

It is necessary to equip with new technologies not only new projects swine farm, projects of their reconstruction but also to stimulate work on their development on objects maintained now swine breeding, that will allow with to form national branches swine breeding, competitive in the world market of meat production, stage by stage to increase per capita consumption of pork to 24 kg a year to Russia and 35 kg in Belarus.

New technologies and the equipment will provide profitable competitive manufacture and realization of meat of pork in volume of 2070 thousand tons a year in lethal weight in Russia in 2010 and 320 thousand tons in lethal weight in Belarus in 2010 both 3200 and 420 thousand tons in 2015 accordingly full satisfaction of requirement of the domestic markets in pork and formation of an export potential of branch.

2. Ways of the decision of a problem of technical re-equipment of branch swine breeding

Russia and Belarus have identical technologies and the equipment for the maintenance of pigs. The equipment of pigsties is worn excessively out, technologically obsolete. The technological requirement for the new equipment can be estimated on capacities 171 swine breeding complex Russia:

- ♦ 216 thousand goals – 9 swine breeding complex;
- ♦ 108 thousand goals – 21 swine breeding complex;
- ♦ 54 thousand goals – 30 swine breeding complex;
- ♦ 12–24 thousand goals – 111 swine breeding complex.

Technological requirement for the new equipment on capacities 107 swine breeding complex Belarus:

- ♦ 108 thousand goals – 3 swine breeding complex;
- ♦ 54 thousand goals – 5 swine breeding complex and 7 selectivity-hybrid centres on cultivation;
- ♦ 12–24 thousand goals – 92 swine breeding complex.

The program of technical and technological reequipment swine breeding contains three basic directions:

- ♦ Reconstruction of the existing specialized enterprises for pork manufacture;
- ♦ New building of pig-breeding farms and complexes;
- ♦ Pork manufacture in farmer and personal part-time farms.

Now the Russian Federation and Belarus have the big scientific and industrial potential, scientists and practice of both parties have saved up sufficient knowledge and experience of working out of the process equipment, its manufacturing and operation and technologies of the maintenance of pigs. Planned to working out and development resourcesaving technology, ecologically safe “know-how” and the modern technics created on their basis will allow to receive high-quality meat production, resource and power expenses for a unit of production will be reduced thus on 15–25 %. Cost of the created new process equipment will be below foreign analogues in 1.2–1.3 times.

In the field of swine breeding mechanization in Republican Unitary Enterprise «Scientific-practical center of the National academy of sciences of Belarus for agricultural mechanization» is developed the complete set of the equipment for preparation and distribution of damp forages to pigs fattening into which structure enters different a number of amalgamators on 2; 3.5 and 5 m³ with systems тензометрического weightings of components and automatic delivery combo food to pigs with use of transporting devices.

Such equipment is established in base economy cooperative «the Ascending dawn» Kobrinsky area and cooperative «The Beacon Braslavsky» Braslavsky area, Open Society “Crane” of Pruzhansky area, cooperative “Prinemansky” Novogrudsky area and provides feeding of all feeding livestock on swine breeding complex with capacity 12–24 thousand goals year. In proper company “Svitino-VMK” preparation of forages with fermentation to 70 % of a rye in diets of pigs and distribution damp combo food on swine breeding complex with capacity of 24 thousand pigs is introduced also.

For the first time it is developed together with Republican Unitary Enterprise «Scientific-practical center of the National academy of sciences of Belarus for animal husbandry» and manufacture complete equipment for the maintenance of sows of all groups as a part of three machine tools is mastered by our Center: the pens for insemination COC-1, the pens for the maintenance sows with pigs COП-1, the pens for the maintenance sows CPM-8. Pens have passed acceptance tests and are put on manufacture. Pens meet technological and ecological requirements on waterless removal of manure have an anticorrosive covering of steel surfaces, polymeric protecting panels and trellised floors. Besides, the Center develops the complete set of the equipment for microclimate creation in pig-breeding premises. It has allowed solving in a complex modernization swine breeding complex questions. Now the Center conducts complete delivery of the equipment on two swine breeding complex.

It is necessary to notice, that the Center has put the pig-breeding equipment for insemination of sows to Russia.

Introduction full complex equipment allows to reach following indicators by pork manufacture: the expense of a forage 3.5–4 kg on additional weight kg, a daily average additional weight 600–700 g, the electric power expense on 1 t pork – 350–450 kW.

Taking into account increase of cost of power resources in the world market in Belarus the Center there are begun works on use of a manure waste swine breeding complex for biogas reception.

Thus questions of protection of environment from pollution by pig-breeding manure drains will be solved.

Three biogas installations by capacity to 500 kw are in a stage of end of building.

Conclusions

1. Close cooperation of scientists has allowed to develop uniform principles to working out of new technologies and the equipment for technical re-equipment for swine breeding complex in Russia and Belarus.
2. In Belarus the complete set of the equipment is developed for the maintenance of sows various groups that allows to conduct reconstruction of swine breeding complex the domestic equipment.

ИННОВАЦИОННОЕ РАЗВИТИЕ СВИНОВОДСТВА В РОССИИ И БЕЛАРУСИ НА НОВОМ ТЕХНИЧЕСКОМ УРОВНЕ

В. Г. Самосюк, В. Н. Гутман, В. О. Китиков

Свиноводство России и Беларуси вступило в качественно новый этап своего развития, характерной особенностью которого является внедрение инновационных технологий и лучших мировых достижений.

В рамках реализации приоритетного национального проекта было намечено построить и реконструировать 272 объекта по свиноводству, ввод которых позволит довести производство свинины в стране к 2012 году до 3 млн. тонн в убойной массе.

По состоянию на 1 октября текущего года поголовье свиней во всех категориях хозяйств составило 17,6 млн. голов, что на 4,2 млн. голов больше, чем было в предпроектном 2005 году. В 2007 году было реализовано на убой свиней 2,5 млн. тонн в живом весе, что на 482 тыс. тонн или на 24 % больше уровня 2005 года. За 9 месяцев т.г. реализация на убой свиней возросла к соответствующему периоду предыдущего года на 7,7 %, в сельхозпредприятиях – на 13,5 %.

В то же время, в объеме реализации скота и птицы на убой свинина сегодня занимает 29 %. Потребление свинины на душу населения составляет 18 кг в год, в том числе за счет собственного производства всего 13 кг. В мире свинина находится на первом месте по потреблению среди всех видов мяса. В странах Европы этот показатель выше 40 килограммов. Определяющим звеном новой системы свиноводства должна стать современная генетика. Именно, такие качественные характеристики как здоровье, скорость роста, постность мяса, многоплодие, стрессоустойчивость определяются в решающей мере генетическим потенциалом хряков и маток.

И вся современная генетика строится на росте этого генетического потенциала каждого животного и стада в целом. Генетика перешагнула узкие границы отдельных хозяйств и ведется крупнейшими генетическими компаниями мира и управляется в большинстве стран на государственном уровне.

Поэтому должны быть созданы современные Генетические Центры, задача которых заниматься воспроизводством чистопородных животных, наращивать генетический потенциал чистопородных стад и производить для товарных хозяйств 2-х породных свинок и высококлассных хряков третьей породы, чтобы максимально использовать эффект гетерозиса от 3-х, а возможно и 4-х линейной гибридизации.