Analysis of age features of non-productive disposal of piglets in the conditions of the industrial pig complex

I V Kulachenko, V V Dronov, M I Stacenko and S V Vorobievskaya

Federal State Budgetary Educational Institution of Higher Education «Belgorod State Agricultural University named after V. Gorin», Maiskiy, Belgorod region, Russia

E-mail: irinakulachenko@mail.ru

Abstract. The article presents an analysis of the state of unproductive disposal of pigs of different ages and groups in one of the industrial complexes of the Belgorod region based on the results of annual reports over the past four years. The percentage of unproductive loss of pigs was calculated according to the generally accepted method, based on the indicators of the number of pigs eliminated at different ages in relation to the total disposal of pigs of all ages at the end of the year. The largest percentage of animal deaths was among piglets aged 0-28 days and 75-160 days, which negatively affected the profitability of the enterprise and required urgent measures from livestock breeders and veterinary specialists to study and eliminate the causes.

Pig breeding is one of the most highly efficient livestock sectors in the agro-industrial complex of the Belgorod region. The region is the leader in the number of pigs (in 2019 - 8.7 million heads), and its share in the total livestock in the Russian Federation is 18.8%. In 2019, pork production in the region amounted to 896.6 thousand tons.

At the same time, with the widespread introduction of industrial production technologies, new problems appear associated with the increased incidence of a decrease in natural resistance and an increase in the incidence of pigs. The problem of preservation or survival of piglets of various technological groups of raising is becoming especially urgent. [1, 2, 3].

Scientists and veterinarians constantly analyze the situation with diseases of pigs, conduct annual monitoring of unproductive disposals of animals in order to make decisions on the timely correction of preventive measures.

So it has already been noted that only by improving feeding and normalizing the microclimate in the premises where pigs are kept, it is possible to reduce the number of respiratory diseases by many times, and by sanitizing feed and drinking water - to minimize losses from bacterial gastrointestinal diseases. It has been shown that such a technological method as timely replacement of the sow herd allows getting rid of the respiratory-reproductive syndrome and parvovirus infection, and replacing the old ventilation system helps reduce the percentage of pulmonary diseases.

The aim of the research was to analyze the age-related characteristics of unproductive disposal of piglets in an industrial pig farm.

The material for conducting analytical studies was the data of annual reports on unproductive disposal of piglets in one of the industrial pig breeding complexes in the Belgorod region based on the results of reports for 2016-2018 and the first half of 2019. In the conditions of the pig complex, all sites
are equipped with the most modern equipment from leading world companies, and the technological processes are almost completely automated.

When analyzing the unproductive retirement of piglets, we took into account the data for the age technological groups 0-28 days, 28-75 days, and 75-160 days. The percentage of unproductive disposal of pigs was calculated according to the generally accepted method, based on the indicators of the number of abandoned pigs at different ages in relation to the total disposal of pigs of all ages at the end of the year. When interpreting the results, the analysis used literature data with reference to the authors.

The results of the analysis of the disposal of piglets at the age of 0-28 days, given by us in Table 1, indicate that their number was, respectively, from 34.4 to 44.68% of the total number of disposed pigs based on the results of accounting in 2016-2018 and the first half of 2019.

**Table 1. Unproductive disposal of piglets by rearing groups.**

| Piglet population | 2016  | 2017  | 2018  | 1st half of 2019 |
|-------------------|-------|-------|-------|-----------------|
| The total number of disposed pigs | 15263 | 15639 | 21054 | 9470 |
| Disposal at the age of 0-28 days | 6185  | 6988  | 7242  | 3846 |
| % of the total number of disposed pigs | 40.52 | 44.68 | 34.4  | 40.63 |
| Disposal at the age of 28-74 days | 2217  | 2636  | 4635  | 3962 |
| % of the total number of disposed | 14.52 | 16.85 | 22.02 | 14.31 |
| Disposal at the age of 75-160 days | 6315  | 5490  | 8462  | 3962 |
| % of the total number of disposed | 41.37 | 35.10 | 40.25 | 41.83 |
| Disposal of pigs of other ages. | 546   | 525   | 695   | 304  |
| % of the total number of disposed | 3.59  | 3.37  | 3.33  | 3.23 |

Under the conditions of the analyzed complex, up to 130 thousand piglets are annually obtained, therefore, the unproductive disposal of suckling piglets from the total number obtained is from 11.74 to 16.19%, which exceeds the accepted norms (10%) by 1.75-6.19%.

In the literature, it is noted that the reasons for the disposal of young piglets are most often: the birth of piglets with a reduced live weight (up to 0.7 kg); irregular suckling of their mother due to non-competitiveness with larger piglets; malnutrition - due to the low milk production of the sow; crushing and hypothermia (piglets are born with an imperfect thermoregulation system) [4, 5]. It is also important that in the first 0-28 days of life, piglets are very sensitive to high humidity in the room, low temperatures and to the quality of feed. From a physiological point of view, this is explained by the fact that during this age period, piglets do not develop subcutaneous adipose tissue, bristles, there is no hydrochloric acid in the gastric juice, and there are no protective substances in the body against colds and gastrointestinal diseases. The mortality rate of piglets of this age group in the conditions of other complexes of the Russian Federation is also high, as evidenced by the studies of E.S. Luchkina and A.O. Fedorova (2015) based on the results of observations over six years in the conditions of pig farms in the Amur Region [6].

Early weaning of piglets is used at the pig farm as an important and highly effective technological method. Piglets are transferred to rearing when the weight reaches 7-9 kg, its duration is 52-54 days. The weight of piglets when transferred to fattening is 26-29 kg.
Among the positive aspects of early weaning, it is noted, first of all, that piglets weaned at this age are earlier accustomed to eating plant feed. Their digestive tract develops better, thanks to which they grow well and use a variety of foods. In addition, scientists note that early weaning of piglets can also significantly save on the maintenance of a lactating sow, since its feeding rate during lactation increases by 70-80%. In addition, with early weaning, suckling sows practically do not have time to lose their fatness, which contributes to their more intensive use in order to obtain from them 2.2-2.4 farrowings per year and increase the yield of piglets, as well as reduce the cost of keeping queens in throughout the year [7].

The results of the analysis showed that the disposal of piglets after weaning at the age of 28-72 days ranged from 14.31 to 22.02% of the total number of unproductively disposed, which is 2.03 and 2.4 times lower than in the previous period. According to S.A. Samkov (2015) and other authors, rearing of piglets is one of the most difficult periods in the process of pork production. At this time, active immunity of young animals is intensively formed, which subsequently affects health and productivity up to delivery to the meat processing plant. Obtaining maximum productivity results during the rearing period directly affects the results of the subsequent fattening of pigs: livestock safety, average daily gains, feed conversion, quality of pig carcasses during slaughter [8]. Attention is also focused on the data on the significant importance of severe stress caused by weaning in the disposal of piglets at the age of 28-72 days, as well as the influence of possible errors in microclimate parameters, quality of feeding and stocking density, leading to a decrease in immunity and the occurrence of various diseases.

At the age of 75-160 days, the piglets of this complex are fattening for 115 days. During this period, they reach a mass of 112 and more kilograms. Disposal of fattening pigs at the end of 2016–2018 ranged from 35.1 to 41.83% of the total number of pigs disposal and was approximately at the level of disposal of pigs at the age of 0-28 days. We believe that a high percentage of pigs disposal in this age group is a negative factor and causes concern, since according to the norms, the disposal of young animals for fattening should be 10 times lower than in the suckling period and 4 times lower than during the rearing period [1]. This indicates that not only age is important in the unproductive disposal of piglets from an industrial pig farm.

Analyzing the literature sources, we drew attention to the information that according to statistics, 98.5% of pigs on fodder die precisely from non-contagious diseases, in the ethology of which conditions of keeping, observance of feeding rules and the use of low-quality feed are important [9]. Significantly negatively affects physiological state, metabolism and productivity of young pigs for fattening, violation of the mechanisms of the physiological antioxidant system and stress of compacted content [9]. Thus, P. Zhuk, among the diseases caused by the vibration of feeding technology, distinguishes several main reasons - this is an unbalanced diet; poor quality and toxic feed; mycoses and mycotoxicoses [10]. In the conditions of the analyzed pig complex, universal dry feeding of pigs is used, which is suitable for almost all age groups and all weight categories of pigs. Dry feeding of pigs is a significant time saving for feed preparation; hygiene of the feeding process; no stress in animals when distributing feed; dry manure without a pungent odor; cheaper equipment (than with the liquid version), which is required to organize the feeding process; decrease in the amount of ammonia in the air; balanced feed; thermal treatment in the production of compound feed (for example, feeding pigs with extruded feed) has a positive effect on the production of enzymes - better digestibility of nutrients. An important condition is that the piglets must have free access to drinking water. When feeding dry food, it is important to provide the piglets with enough water to prevent constipation, which can cause growth retardation. The water temperature must be at least 15°C. This will reduce costs and increase profitability by improving the safety of young stock, saving feed and introducing innovative technologies.

According to V.I. Balabanova, A.A. Kudryashov (2018) of the diseases, the greatest danger for piglets in the fattening period of raising is such as streptococciosis, intestinal volvulus, mycotoxicosis, hypovitaminosis E, stomach ulcer and other diseases [11].

Such a disease of pigs as streptococciosis is one of the most common infectious diseases in pig breeding in the Russian Federation and the Belgorod Region, annually causing significant economic damage to the industry and throughout the world. Mortality of piglets during an outbreak of...
streptococcosis on rearing, according to the literature, is up to 12%, and on fattening - up to 22% [12]. In the work of D. Potapchuk, S. Ushakov, A. Lemysh (2020), attention is drawn to the fact that Streptococcus suis causes meningitis, arthritis, polyserositis, endocarditis, otitis media, bronchopneumonia, which ultimately lead to significant economic losses in pig breeding. The bacterium adapts quite well to the defense mechanisms of the host's immune system, colonizes many species/types of mucous membranes, and is also a permanent inhabitant of the upper respiratory tract and tonsils [13, 14, 15].

It is believed that for effective prevention of enzootic outbreaks of streptococcosis, it is necessary to quickly make a final diagnosis, identify the causes of enzootic, be sure to regulate the microclimate, effectively treat with antibiotics, sanitize sows and additionally disinfect in the presence of animals.

Only the introduction of modern ventilation systems and regulation of planting density is compensated within 1-2.5 years and increases production efficiency by 30% -80% [10].

Unproductive disposal of pigs of other ages by years varied slightly and ranged from 3.23 to 3.59%. Thus, in the conditions of an industrial pig complex, the unproductive disposal of piglets has age characteristics and varies by years, respectively, at the age of 0-28 days from 34.4 to 44.68%, at the age of 28-72 days - from 14.31 to 22.02%, in aged 75-160 days - from 35.1 to 41.83%, in other age groups - from 3.23 to 3.59% of the total number of dropouts by year. In the unproductive disposal of pigs, not only age matters, but also high-quality feeding, strict observance of veterinary and sanitary conditions and the prevention of diseases.

The economic damage from the unproductive disposal of piglets was, respectively, in 2016 - 28804 million. rub.; 2017 - 37990; 2018 - 47067 and in the first half of 2019 - 25356 mln. rubles. The farm specialists were invited to systematically analyze the situation with unproductive disposal of livestock, timely adjust the veterinary and sanitary measures, the quality of feeding and the prevention of diseases, especially during the fattening period.

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