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Research article

Management of sow replacement rate

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Abstract. Reproduction performances in sows depend considerably on the way the swine breeder knows how to manage the different stages in the swine growing and finishing activity. Increasing economic efficiency in swine exploitation, in both intensive animal farming and on medium and small farms, needs methods and methodologies based on the scientific organization of the reproduction, taking into account the replacement rate of low performance sows. In order to get high productions during the fall-winter period, when heat intensity is higher and the number of unproductive days is low, we need a replacement rate between 59.81 ± 3.03 and 63.28 ± 3.29, while during the spring-summer period, replacement rate should be lower, but not below 45%.
Key Words: sows, management, replacement rate, season.

Introduction. Obtaining good economic results in swine breeding, i.e. a higher number of piglets and higher weight gains, depends on several biological processes:
- the reproduction process and the female and male young swine growth process;
- young swine finishing process;
- female replacement rate.

Reproduction activity in swine is of particular importance in increasing animal numbers. In the first two gestation periods, young females do not yield their maximum (Bogdan et al 1981; Bunter et al 2008; Petroman et al 2011). In young sows, the number of ovules reaching maturity is lower (12-16), but it increases in the following ovulations reaching even 30 ovules. The optimal number of ovules reaching maturity is achieved between 2 and 4 years of age and it decreases with the number of years.

Heat in sows occurs more frequently in the morning, between 4 and 10 o'clock, and in the evening, between 19 and 22 o'clock, which plays a decisive role in the establishment of the optimal time for mating. In young sows, sexual maturity signs occur ever since the age of 4 months: there are heats, but they are not accompanied by ovulation and there is no immobility reflex (Burns & Spityer 1992; Edge et al 2006).

True heats occur only upon first ovulations, which coincide with the age of 5-6 months. This is the moment when sexual maturity occurs (Blair 1984; Tanaka & Koketsu 2007).

Optimal reproduction age occurs when young sows reach a certain body weight that influences favorably both the number of piglets and their weight upon delivery. In present breeds, optimal reproduction age is 8-9 months, when females reach a body weight of 110-120 kg. Using younger sows, weighing less, has negative impacts on the development of the fetuses and, as a result, the newly-born piglets will have lower body weights and lower viability (Petroman 2007).

First heats can be guided through feeding. For instance, if until the sow weighs 40 kg, feeding is *ad libitum*; after reaching this weight, feed amount decreases and heats can occur at a body weight of 65-70 kg.

Materials and Methods. To carry out the present research, we made measurements on an industrial swine reproduction farm in order to find out the optimal rate of sow replacement to implement a performing management of reproduction and to turn the farm into an efficient one.

Results and Discussion. If we need a farm to make profit, we need to take into account the production costs, besides some superior reproduction indicators. Besides the cost of fodder (representing between 60 and 70%) and utilities, we need to also add the costs of animal replacement – and the costs of high genetic value replacement animals are high. Replacement rate on a reproduction farm needs to reach about 55%. These animals should ensure the replacement of old sows, of diseased sows that are no longer fit for reproduction, and of dead sows. The replacement rates, depending on the season, on the studied farm are shown in Table 1.

Table 1

Proportion of reproduction herd replacement rate, within the investigated farm, according to season

Month	Replacement rate
March	60.25 ± 3.09
April	58.33 ± 2.78
May	48.72 ± 3.55
June	46.66 ± 2.98
July	52.69 ± 4.06
August	55.03 ± 3.61
September	63.28 ± 3.29
October	52.90 ± 2.19
November	59.81 ± 3.03
December	60.06 ± 4.02
January	62.00 ± 4.50
February	58.38 ± 3.02

In March, replacement rate was 60.25 ± 3.09, in April it was 58.33 ± 2.78 and in May it was 48.72 ± 3.55 – the lowest replacement rate on the studied farm. Replacement rate during the summer months was between 46.66 ± 2.98 in June, 52.69 ± 4.06 in July and 55.03 ± 3.61 in August.

The highest replacement rate was in September: 63.28 ± 3.29. In October, the replacement rate was 52.90 ± 2.19, and in November, the replacement rate was 59.81 ± 3.03. Replacement rates during the winter months were: 60.06 ± 4.02 in December, 62.00 ± 4.50 in January and 58.38 ± 3.02 in February.

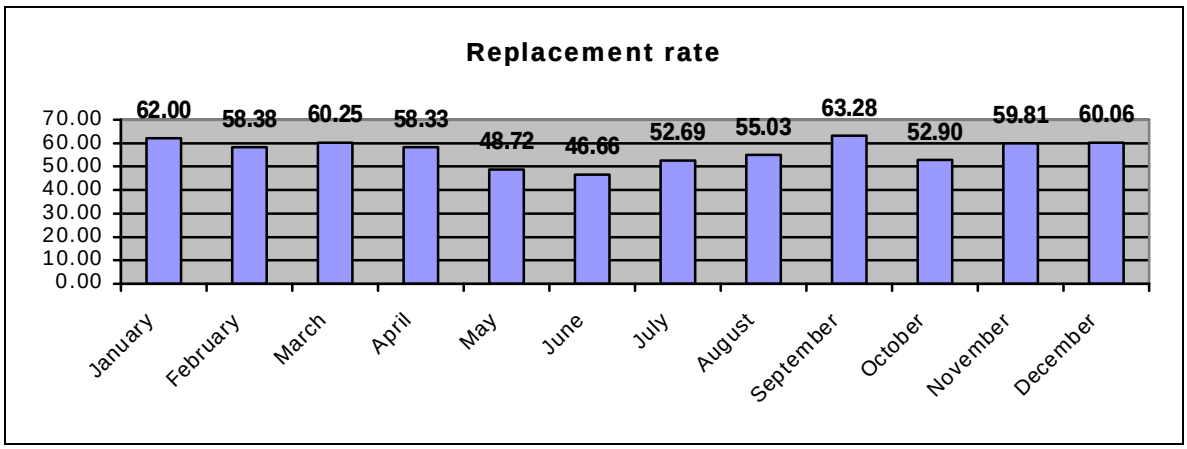

Figure 1. Replacement rate, within the investigated farm, according to season.

Table 1 and Figure 1 show that, during the summer period, replacement rates are low, because in summer, heat rate is lower in young sows, and the manager of the swine farm in which we conducted our study wanted to diminish the number of unproductive days in summer, making an option for a higher replacement rate during the period of time in which unproductive days are few and heat is intense.

Conclusions. In order to reach higher reproduction indicators with proper costs and in order to increase biological value of the studied animals, we need to monitor more carefully the young animals and the replacement of adult sows with reproduction issues or with high unproductive duration.

As a result of our research on the improvement of the performances of the farm, we recommend that the replacement rate depending on the season be done as follows: in spring, 50-55%; in summer, 45-50%; in autumn, 55-60%, and in winter, 60-65%.

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