Influence of Rearing System on Sows' Prolificacy during Gestation

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Abstract
In females reared in individual crates until early control of gestation and in common crates (8-16 heads), prolificacy did not reach values that differ depending on the rearing system: there is a statistically insignificant difference in t-test ($p>0.05$). In gestating sows reared in individual crates, the difference was significant during the entire gestation period compared to group rearing: 11.51±0.85 compared to only 11.13±0.68 in collective rearing. Though there are better results from the point of view of sows' prolificacy when reared in individual crates during the entire gestation, this rearing system is not recommendable because of the high financial efforts caused by technology and because separation has negative influences on sows' behaviour depending on reproduction and health state of gestating females.

Keywords: sows, rearing system, gestation, prolificacy

1. Introduction

The reproduction function in swine is determined by a series of factors, among which reproduction cycle, which, in its turn, influences in a high measure the sows' general state of health [1-3] – season, environment, rearing system, and sows' age.

The analysis of the **factors influencing the reproduction function in swine** has been studied for over six decades. [4,5]

SEASON. Maybe this is the best example of impact on sows' reproduction performance. Such an example is provided by Lutaaya *et al*. [1], who analyse sows' reproduction performance reared in different types of crates during gestation.

These researchers reached the conclusion that all reproduction components suggest a low performance during the summer months, particularly when sows are reared in collective crates. The solutions for reducing the stress caused by heat are the improvement of the rearing technology during maternity and gestation, changing feeding practices, changing management, and cooling the pens – particularly in the case of gilts and primiparous sows – all to reduce losses (days when sows are not productive, low reproduction performances, low age upon reformation) and costs of replacing sows with gilts.

Though sows are poly-oestrus animals (animals in which oestrus repeat cyclically during the entire year), there are variations in oestrus determined by breed, individual, climate, **season**, rearing system, and health state. Season influences oestrus as follows [6-8]:

- In spring, the share of oestrus sows was 94,4% in sows with 4-5 farrows, 94.6% in sows with 2-3 farrows, and 94% in primiparous sows;
- In summer, the share of oestrus sows was 91,4% in sows with 4-5 farrows, 88.3% in sows with 2-3 farrows, and 86% in primiparous sows;
- In autumn, the share of oestrus sows was 92.2% in sows with 4-5 farrows, 94.5% in sows with 2-3 farrows, and 86.7% in primiparous sows;;

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- In winter, the share of oestrus sows was 94.6% in sows with 4-5 farrows, 94.9% in sows with 2-3 farrows, and 94.1% in primiparous sows.

The season with the best results in oestrus symptoms was winter, followed by spring and autumn. The lowest results were in the hot season, when oestrus is less intense in symptoms ("silent oestrus"), which makes farmers look for methods to improve the management of the reproduction sector by installing air-cooling and moisturising devices [9-11].

ENVIRONMENT. The influence of environmental air temperatures has effects on both feed intake and feeding behaviour in lactating sows and in multiparous gestating sows [12,13]. Though they have been looking for methods to keep the temperature constant during the day, day temperature fluctuates practically contributing to sows' restlessness when in advanced phases of gestation, which has economic impacts.

This is why the environmental temperature has important effects on the amount of feed intake by lactating sows, by multiparous gestating sows, and on their feeding behaviour.

REARING SYSTEM. Reproduction performances in sows largely depend on the way the swine breeder knows how to manage the different stages of the farm activity [14,15]**.**

Such an example of management is provided by some researchers [16-18] who reached the conclusion that though the sows are, in general, in oestrus during lactation, there are also situations in which they show both oestrus and ovulation symptoms. A practical advantage of this conclusion is the reduction of the reproduction cycle.

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2. Materials and methods

In this study carried out on a swine farm, we investigated the influence of the rearing system in gestating sows in individual and collective crates and their influence on sows' prolificacy. Results were processed statistically to see if the rearing system has a significant influence on prolificacy and if we need to take measures to improve the rearing technology of gestating sows.

3. Results and discussion

To improve reproduction indices, we need to Prolificacy is defined as the number of piglets born alive and viable by a sow upon parturition, per year, or during its entire reproductive life. This production index can be influenced by a series of genetic, physiological, and rearing factors.

Prolificacy in the studied females reared in common crates of different capacities ranges, on the average, between 11.13±0.68 piglets/sow, as shown in Table 1 and Figure 1.

Thus, in the case of the sows reared in individual crates until early control of gestation, prolificacy was 11.10±0.62 piglets/sow; in the animals reared in crates of eight heads, prolificacy reached 11.05±0.31 piglets/sow; in the case of the sows reared in crates for 16 animals, prolificacy was 11.23±0.50 piglets/sow.

The difference between sow prolificacy depending on the rearing system was not statistically significant (test t $p>0.05$).

The prolificacy of the sows reared in individual crates during the entire gestation was superior (Table 2 and Figure 2): the difference compared to the mean of the sows reared in group crates was significant (11.51±0.85 piglets/sow/farrowing).

Table 1. Sows' prolificacy depending on group crate size

Crate type	Prolificacy
Individual crates up to 35 days	11.10±0.62[a]
Crates for 8 animals	11.05±0.31[a]
Crates for 16 animals	11.23±0.50[a]
Total	11.13±0.68

test t A-a $p<0.001$, A-b $p<0.01$, A-c, $p<0.05$, a-a $p>0.05$

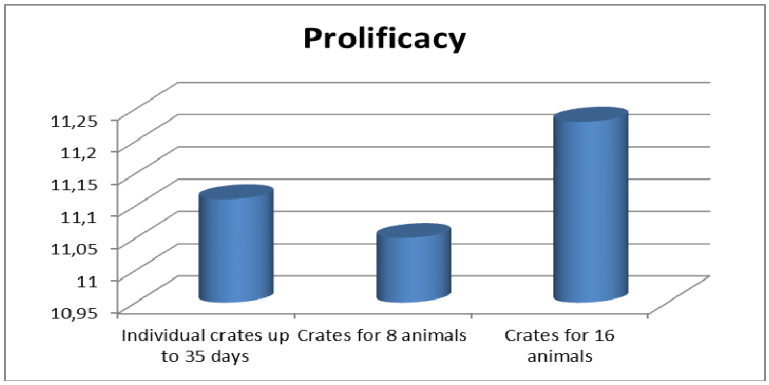

Figure 1. Sows' prolificacy depending on group crate size

Table 2. Sows' prolificacy depending on different crate types

Crate type	Prolificacy
Individual crates	11.51±0.85[a]
Group crates	11.13±0.68

test t A-a $p<0.001$, A-b $p<0.01$, A-c. $p<0.05$, a-a $p>0.05$

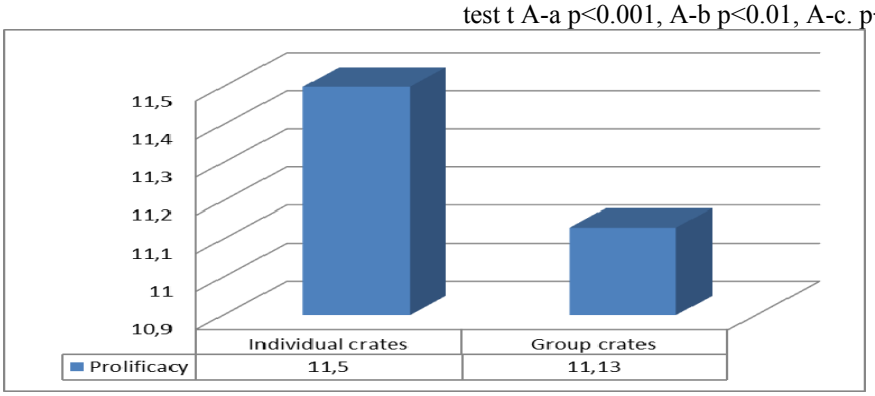

Figure 2. Sows' prolificacy depending on different crate types

Conclusions

Rearing sows in individual crates has a positive influence on prolificacy because mechanical factors (that cause gestation losses) are excluded, but it is less recommendable. This rearing system is not to be recommended because it increases costs with buildings and technology per capita, with negative influences on the reproduction function of the sows (they cannot move enough).
Though results are lower in group rearing, we believe that farm management can improve these production indices removing the need for supplementary costs for more performing technologies that could increase sows' rearing costs; the surplus of piglets does not justify the financial efforts in swine farms with small numbers of animals.

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