

Induction of lactational estrus in organic piglet production

A.G. Kongsted^{*}, J.E. Hermansen

Department of Agroecology and Environment, Faculty of Agricultural Sciences, Aarhus University, Tjele, Denmark

Received 19 May 2009; received in revised form 6 July 2009; accepted 12 July 2009

Abstract

The longer lactation period required in organic piglet producing herds reduces the potential number of produced litters per sow per year compared with that of conventional production. Induction and use of lactational estrus may be a way to increase the productivity in organic production. However, if lactational estrus is to be beneficial under practical husbandry conditions, it is crucial that the majority of sows are successfully mated within a few days to make batch farrowing procedures possible. The objective of this study was to investigate the occurrence and timing of lactational estrus in an organic outdoor system based on ad libitum feeding, individual housing until Day 35 in lactation, followed by grouping and introduction of a boar and weaning of piglets after 8 wk. Five groups with four sows ((Danish Yorkshire × Danish Landrace) × Danish Duroc) in each were observed, and rank was determined by a food competition test. All sows showed lactational estrus, and 84% of these sows showed estrus within 1 wk, on average 43.5 d and 7.3 d after farrowing and boar introduction, respectively. The number of days from boar introduction to estrus increased significantly with increasing feed competition rank (the lowest number being the top rank position). Eighty-four percent of all sows were diagnosed pregnant 5 wk after estrus. Behavioral observations revealed that the average total number of copulations per estrus sow was 2.3 with a range of 0 to 5 copulations. The findings of the current study indicate that it is possible to combine lactational estrus and batch farrowing procedures to increase the number of weaned piglets per year per sow in organic piglet production based on 8 wk of lactation or more.

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Keywords: Lactational estrus; Mating behavior; Organic; Pig production; Reproduction

1. Introduction

Organic piglet production is characterized by lesser productivity in terms of weaned piglets per sow per year compared with that of conventional piglet production. This is partly due to the longer lactation period required in organic production. According to European Union legislation, piglets may not be weaned until 40 d of age, and specific Danish and Swedish regulations stipulate a minimum lactation period of 49 d. The longer lactation period

has a direct effect on productivity because it reduces the potential number of produced litters per sow per year. The effect may, however, also be more indirect in terms of longer and unsynchronized weaning-to-estrus intervals caused by ovulations during the last weeks of lactation [1,2]. As a consequence, lactational estrus is traditionally considered as disadvantageous in organic pig production in, for example, Denmark [3] and Sweden [1]. However, if it is possible to breed sows during lactation, this will not only increase sow productivity but also allow for delaying weaning beyond 40 or 49 d of age without jeopardizing sow productivity. Under seminatural conditions, the weaning is not completed before Week 13 [4] to 17 weeks [5] postpartum. An increased

^{*} Corresponding author. Tel.: +45 8999 1252; fax: +45 8999 1200.
E-mail address: AnneG.Kongsted@agrsci.dk (A.G. Kongsted).

weaning age would thus comply well with the important aim in organic livestock production of allowing the animals to express their natural behavior. It would probably also reduce the risk of weaning diarrhea [6], which is a common problem in organic production [7].

If lactational estrus is to be beneficial under practical husbandry conditions, it is important that the majority of sows are successfully mated within a few days in lactation to make batch farrowing procedures possible. In an English on-farm survey, all sows showed lactational estrus on average 35 d after farrowing [8]. Approximately 70% of all the sows showed estrus within the same week, and 85% of these became pregnant. The sows were grouped about 3 wk post partum, fed ad libitum, and introduced to a boar 1 d after grouping. The accommodation used consisted of covered yards provided with an insulated lying area. Similar or less successful results have been obtained in other studies with indoor-housed sows [9].

We hypothesize that it is possible to obtain a more precise timing of lactational estrus in an organic sow herd by using grouping and boar introduction, due to the more stimulating environment in a system based on free-range production. Enriching the physical environment (e.g., more space, outside yards) has previously been shown to increase the occurrence of lactational estrus in sows [10].

In addition to group-housing, lactations lasting longer than 45 d, and ad libitum feeding, frequent contact with a boar has been suggested as an important feature in inducing lactational estrus in sows [9]. It therefore seems obvious to combine the induction of lactational estrus in organic piglet production with unsupervised services by a boar within a group of sows. This system further complies well with the organic ideal of facilitating natural animal behavior. Unsupervised services in a group of lactating sows may, however, result in greater return rates as previously reported by Rowlinson and Bryant [11]. This may be caused by an uneven ratio of services per sow as suggested by Rowlinson et al. [8] and previously observed in outdoor multi-sire mating systems [11].

The objectives of the current experiment were to investigate (1) the occurrence and timing of lactational estrus in an outdoor system based on ad libitum feeding and individual housing from farrowing until Day 35 followed by grouping and the introduction of a boar; and (2) the reproductive behavior of sows and boars in a system based on induction of lactational estrus and unsupervised services by a boar within the group of sows.

2. Materials and methods

The study was conducted on a research station in the Middle of Jutland, Denmark. Five groups consisting of four multiparous sows per group were monitored from October 2006 to March 2007. The parity number varied from 2 to 11. All 20 sows were crossbreeds ((Danish Yorkshire × Danish Landrace) × Danish Duroc).

Two weeks before farrowing, the sows were moved from large pregnancy paddocks to individual farrowing/lactation paddocks of about 500 m². Each sow and her litter had access to a farrowing hut of approximately 3.5 m². At farrowing, the number of dead and live-born piglets was recorded for each sow. Five weeks after farrowing, the four sows and their piglets were grouped (fences between the individual paddocks were removed). To allow individual identification during behavioral observations, the sows were sprayed with a color code on their backs. Two days after grouping, a boar was introduced (Day 0). An additional hut was placed in the paddock for the boar. The same two boars were used for all five groups. From Day 5 to Day 9, a “new” boar was introduced daily. The piglets were weaned at 7 to 8 wk of age, and litters were weighed.

An organic complete pellet feed for lactating sows was given semi-ad libitum throughout the lactation period. The feed was given in individual troughs once daily. The food ration was gradually increased after farrowing. If there was feed left in troughs, the amount of feed allocated was slightly reduced at the next feeding. The feed contained 13.2 mega joule metabolizable energy (MJ ME) per kg feed and 15.5% crude protein. The boars were fed the same feed as the sows but were separated during feeding from the sows in a small enclosure in the corner of the paddock to avoid obesity. After grouping, the piglets had access to creep feed in a small enclosure in a corner of the paddock to which the sows had no access.

One sow from Group 1 had to be replaced soon after farrowing due to illness. She was replaced by a sow from the same farrowing batch in the herd. Another sow from Group 4 was excluded from the experiment due to mammary gland atrophy just after grouping. This sow only had four piglets at grouping, and they were in poor condition.

2.1. Rank determination, occurrence of estrus, behavioral observations, and udder examination

The ranking in each group was determined by performing a food competition test modified according to Andersen et al. [12]. The test was performed 2 d after grouping before boar introduction. A small amount of

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