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Evaluation of suckling and post weaning practices for improving reproductive efficiency in Nepalese Pakhribas pigs

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Abstract

Thirty sows of second parity were used to investigate a change in suckling pattern for improving reproductive efficiency in sows during lactation. All sows received the same pattern of weaning, which imitated the progressive weaning system used in Nepalese villages. Majority of the farmers start selling their piglets at an age of 6 weeks and continue until all the piglets are sold in the weekly market. Therefore in this study the piglets from each litter were weaned at three ages (6, 7 and 8 weeks of age) in the proportion of 0.5 at 6 weeks followed by 0.2 at each of the subsequent weaning. In the first lactation treatment, the suckling pattern was left undisturbed, similar to the practice used in the villages in which the remaining piglets after first weaning are allowed continuous suckling. In the other treatment, the remaining piglets after first weaning were allowed to suckle their sows only during the night, whilst in the day time (09.00-16.00) they were excluded from the sow but left free to roam around. The weaning to re-mating interval was significantly longer for the unrestricted suckling treatment. All sows were re-mated within 30 days after first weaning in the restricted suckling treatment groups, whereas only 71% of sows were re-mated within 30 days after weaning in the unrestricted suckling treatment groups ($c^2 = 3.877$, 1df, $p<0.05$).

Key words: Farmers, lactation, litter, soils

Introduction

Pakhribas Agricultural Centre (PAC) has developed a synthetic breed named as the Pakhribas pig by three way crossing between Saddleback, Tamworth and Fa Yueen in order to improve an efficiency of pig meat production under rural village conditions (Shrestha, 1998). However, despite better growth performances, reproductive performance of this improved genotype under village conditions was very poor compared to the performance of pigs obtained at the PAC research station in Nepal where it was developed (Gatenby, Chemjong, Pakhrin and Chimaryia, 1990; Shrestha and Ghimire, 1993). This poor performance may be due to inadequacies of nutrition or to poor management practices of the farmers. The experiment was therefore designed to look at aspects of modified management systems which might be applied under village conditions to improve reproductive efficiency.

It was quite common that almost all village farmers weaned their piglets gradually over a period of several weeks allowing piglets to suckle their sows until completely sold depending on the market availability. Partial weaning can be good for the smaller piglets which will have an easy access to suckle their sows for longer period without reduced competition. It also helps to take the pressure off a good milking sow, which will help to minimise the weight loss and restore positive nutrient balance just before weaning (English, 1988). However, this weaning method may also give problems in the re-breeding of the sow. In general, the stimulus of the suckling piglets prevents the sow from coming back into oestrus. When all the piglets are weaned at one time, the sudden removal of this stimulus induces a rapid change in hormonal state of the sow and there will be an induction of oestrus, usually within one week. When weaning takes place only gradually, the timing of oestrus is less predictable and the behavioural symptoms may be less strong, making it easier for oestrus to pass undetected. However, it is not practical to advise farmers to batch wean at a single time in the villages, since they are fully dependent on the availability of a market to sell their piglets in the local weekly market.

Considering an advantage of the progressive weaning method it is desirable to find a method of allowing this to continue offering better reproductive efficiency of sows. Several studies have demonstrated that lactational oestrus or short post-weaning intervals to oestrus are induced when nursing patterns of pigs are altered (Stevenson and Britt, 1981; Stevenson and Davis, 1984). It therefore considered that preventing the piglets from suckling for a part of each day, could easily be applied under village conditions, if proves successful to establish whether such a strategy might be beneficial under Nepalese circumstances.

This experiment was therefore designed to establish whether efficiency of reproduction might be improved in Nepalese circumstances by manipulating suckling management which could easily be affordable to follow by the rural farmers.

Materials and Methods

Two lactation treatments were imposed (i) unrestricted suckling, in which piglets had continuous access to the sow throughout lactation until 8 weeks, and (ii) restricted suckling, in which piglets were denied access to the sow during the daytime between weaning of the first pigs in the litter (6 weeks) and final weaning (8 weeks). Oestrus detection was carried out each day from the time of first weaning, using physical signs and response of the sows to the Back Pressure Test (BPT).

Sows and their management

Sows were allocated between the two lactation treatments, on the basis of farrowing date, liveweight and litter size after any initial cross-fostering, to give a total of 14 sows on the unrestricted suckling treatment and 16 sows in the restricted suckling treatment group. During lactation they were fed twice daily on a commercially produced concentrate ration according to a standard scale based on liveweight and litter size.

Both treatment groups received the same pattern of weaning, which imitated the progressive weaning system used in Nepalese villages. Piglets from each litter were weaned at three ages (6, 7 and 8 weeks of age) in the proportion of 0.5 at 6 weeks followed by 0.25 at each of the subsequent weanings at 7 and 8 weeks of age. If the litter size did not give an even number, then the higher number of piglets was weaned. The heaviest piglets in the litter were selected at each weaning. In the unrestricted suckling treatment, the suckling pattern was left undisturbed, with the remaining piglets after first weaning allowed continuous suckling. In the restricted suckling treatment, the remaining piglets after first weaning were allowed to suckle their sows only during the night, whilst in the day time (09.00-16.00) they were left free to roam around, but prevented from accessing the sow.

Data and statistical analyses

Records taken for each sow included the date of farrowing, the number and weight of suckling piglets at weekly intervals and feed intake. Live weight and body condition score (0-5 scale), backfat thickness and depth of the longissimus dorsi muscle were measured at farrowing, first weaning (42 days) and final weaning (56 days). Backfat thickness and muscle depth were measured ultrasonically at the P_2 position using a Meritronics Livestock Grader. The daily response to BPT, date of first service and any return service, and the subsequent litter size were also recorded. The effect of suckling treatment was analysed by one way ANOVA.

Results

Sow body condition changes

The result of sow body measures taken at farrowing and at 42 days of lactation, prior to application of treatments, is shown in Table 1. The treatments did not differ in any parameter prior to the start of the procedure.

A result of body condition measurements after application of treatments at final weaning (56 days) and at service is given in Table 2.

Piglet growth

There were no significant differences between treatments in the mean liveweight of suckling piglets at different ages from birth to final weaning at 56 days of age (Figure 1). The mean suckling piglet live weight gain was 0.96 and 1.0 kg from first weaning at 42 days to 49 days (sem 0.08, NS) and 0.41 and 0.58 kg from 49 days to 56 days of age (sem 0.11, NS) for the treatment of unrestricted suckling and restricted suckling respectively.

Effect of suckling treatment on sow rebreeding interval

There was a significant difference in the first weaning to re-mating interval between the two different suckling treatments. The mean first weaning to re-mating interval was 22.9 and 16.9 days for the unrestricted suckling and restricted suckling treatment respectively (sem 2.1, $P<0.05$). All the sows were re-mated within 30 days after first weaning in the restricted suckling treatment groups, whereas only 71% of sows were remated within 30 days after weaning in the unrestricted suckling treatment groups. A c^2 test showed a significant difference in the proportion of sows mated within 30 days between treatments ($c^2 = 3.87$, df=1, $P<0.05$). The cumulative frequency of sows re-mated after different intervals is shown in Figure 2.

Discussion

E*ffect of restricted suckling on sow rebreeding*

Weaning of a few piglets progressively over time is a common practice in the villages in Nepal. Partial weaning was therefore applied for both treatment groups. Partial weaning has decreased weaning to oestrus interval in other European and American studies (Smith, 1961; Stevenson and Davis, 1984; Henderson and Hughes, 1984; Newton, Stevenson and Davis, 1987). However, in Nepal partial weaning takes place at a relatively later stage of lactation and continues for a long period after first weaning in comparison with Western practice.

In this experiment, restricted suckling significantly reduced the first weaning to re-mating interval. There might be two possible reasons for achieving shorter weaning to oestrus interval in sows with restricted suckling. Restricted suckling reduced the intensity of suckling stimulus, thereby reducing the block on LH secretion reduced milk yield due to litter separation and hence allows the sow to maintain

Table 1. Sow body condition measures prior to treatment

Treatment	Unrestricted suckling	Restricted suckling	sem	Significance
At farrowing:				
Sow live weight (kg)	103.4	109.7	3.2	NS
Backfat thickness (mm P_2)	18.9	19.1	1.6	NS
Eye muscle depth (mm)	59.0	61.9	2.6	NS
Body condition score	3.1	3.2	0.1	NS
Litter size	9.6	9.7	0.84	NS
At 42 days:				
Sow live weight (kg)	94.2	94.7	3.42	NS
Backfat thickness (mm P_2)	10.5	11.1	1.4	NS
Eye muscle depth (mm)	49.0	49.3	2.2	NS
Body condition score	2.4	2.4	0.1	NS

Table 2. Body condition measures at final weaning (56 days) and at service

Treatment	Unrestricted suckling	Restricted suckling	sem	Significance
At 56 days:				
Sow live weight (kg)	92.5	91.5	4.0	NS
Backfat thickness (mm P_2)	10.0	11.0	1.6	NS
Eye muscle depth (mm)	47.5	48.4	2.6	NS
Body condition score	2.4	2.4	0.1	NS
At service:				
Sow live weight (kg)	96.2	93.7	3.8	NS
Backfat thickness (mm P_2)	12.6	11.6	1.5	NS
Eye muscle depth (mm)	51.0	50.0	2.6	NS
Body condition score	2.6	2.5	0.1	NS

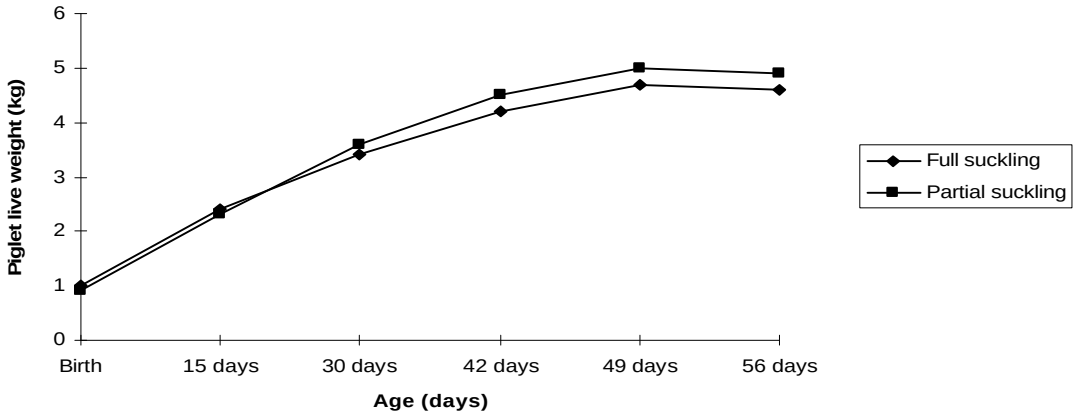

Figure 1. Mean suckling piglet live weight by suckling treatment

better body condition at weaning. In this present experiment, there was no significant effect of restricted suckling on the live weight, P_2 backfat thickness, eye muscle depth and body condition score of sows.

It was expected that restricted suckling would reduce milk yield and, if the same amount of feed intake was achieved, sows would lose less live weight. However, sows with restricted suckling did not appear to benefit in body condition. This suggests that the effect of restricted suckling was not mediated by effects on body condition or metabolic state. The reduction in weaning to oestrus interval was therefore likely to be associated with restriction of the suckling stimulus.

The suckling stimulus inhibits gonadotrophin synthesis and secretion during lactation (Henderson and Hughes, 1984) This inhibition decreases in potency as lactation proceeds (Stevenson and Britt, 1980; Edwards, 1982). However, Smith (1961) reported that litters separated after 31-35 days after farrowing took 13-16 days before showing oestrus, but only 5-7 days for litters separated at 21 days after farrowing. In the present experiment, weaning to remating interval was higher than reported in other European breeds,

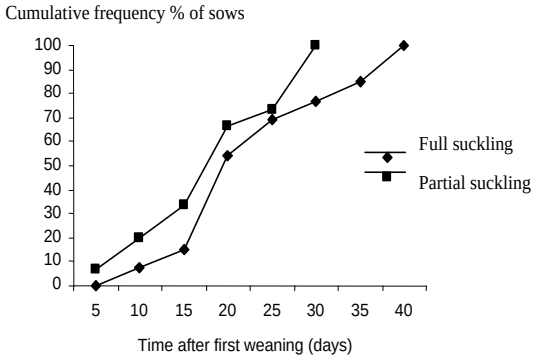

Figure2. The cumulative frequency of sows remated at different times after first weaning

which may be due to delay in application of restricted suckling. However, restricted suckling was still found to be beneficial compared to continuous suckling presently practised by the farmers in the villages.

Effect of restricted suckling on piglet growth

There was no significant difference in the litter weight as a result of restricted suckling. This result appears to be in contrast with other findings, which show that litter weights were reduced by restricted suckling (Henderson and Hughes, 1984; Newton, Stevenson and Davis, 1987). The reason may be due to the application of restricted suckling at the older age of 6 weeks, and to the possibility for the piglets to roam around in the open area and forage. In previous Western experiments there was no access for grazing by restricted suckling piglets, which were confined in housed conditions. Also, since restricted suckling took place earlier in other experiments, the piglets would not have been as efficient in ingesting and digesting feedstuffs other than milk.

Conclusion

Under Nepalese conditions, restricted suckling is a most appropriate technique for reducing weaning to oestrus interval in sows without additional cost to the farmers. This may equally be applicable to Developing countries where similar problem exist.

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