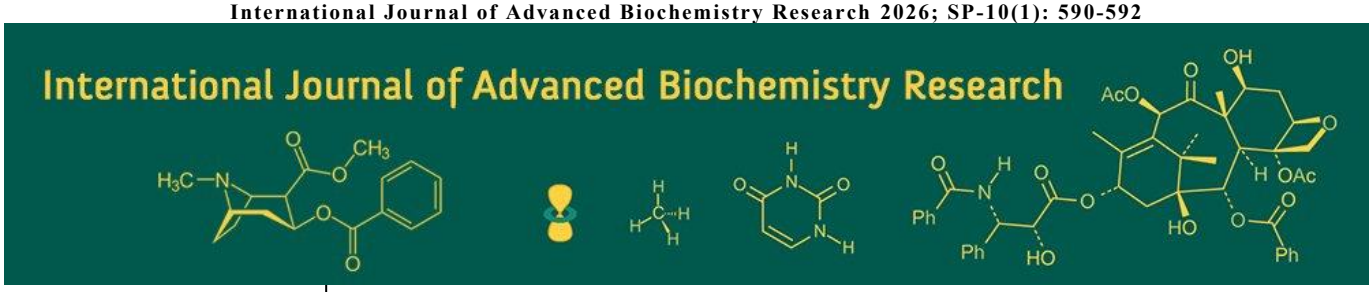

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Effect of split weaning on reproductive performances of Ghungroo sow

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Abstract
Split weaning has significant impact on reproductive performances of sows especially return to estrus and subsequent fertility in sows. Piglet body weight at birth, piglet body weight at weaning, piglet body weight at 8th weeks of age, piglet mortality, weaning to estrus interval, farrowing interval and subsequent littersize were evaluated. Piglet weight at weaning was significantly (P<0.05) higher in control group T_0 (10.48±0.56 kg) as compared to treatment group T_1 (3.31±0.08 kg) and T_2 (4.63±0.17 kg). It was found that return to estrus and subsequent fertility in T_1 and T_2 Ghungroo sow group differ significantly with T_0 group (Control group).

Keywords: Split weaning, fertility, estrus, farrowing, reproductive performance

Introduction
Pig farming is an integral part of animal husbandry. Farrowing stage is very critical period in sow. Sows' maternal behaviour is important for piglet survival and growth. Study revealed that piglets' growth traits were strongly associated with sows' maternal behaviors [Liu, X *et al*., 2023] [4]. Many factors or particular mechanism play a vital role in maternal behaviour regulation namely genetic, physiological (hormonal), environmental, etc. [Collarini *et al*., 2023] [2]. The onset of nest building behaviours such as pawing and gathering straw is associated with a peri-parturient decline in progesterone, an increase in prolactin and a major rise in plasma concentrations of PGF2α the day before parturition [Bo Algers *et al*., 2007] [1]. Good farrowing house management practices will result in increased litter size and piglet weights at weaning. There are many factors contributing to pre-weaning piglet mortality *viz*. hypothermia, disease, still-birth, starvation, crushing and savaging, etc. It requires effective management strategies, farrowing supervision and good stockmanship. The peri-parturient period management interventions is very important to reduce piglet mortality. Split weaning is one of the important management strategies to economic piglet production as well as subsequent sow fertility. Behaviour of pre-weaned and weaned piglets also plays an important role in the survival of piglets. The present study is therefore, an attempt to find out the importance of this particular management strategy i.e split weaning and behaviour on the reduction of piglet mortality as well as subsequent sow fertility.

Materials and Methods
The study was undertaken in Pig Breeding Unit, AAU, LRS, Mandira, Hekera, Kamrup, Assam. The experiment was conducted from Dec, 2020-Dec, 2023. Control group (T_0) piglets were subjected to weaning at 56th day (Traditional weaning) and Treatment group (T_1) piglets were split weaned at 28 days of age whereas in T_2 group, piglet were weaned at 35 days of age. They were provided with creep area, heating bulbs and other managemental practices. The sows of all the groups were fed with commercial finisher ration. The piglets were fed with pre-starter and starter ration as well as scheduled deworming and iron injection were done.
To determine the effect on timing of return to oestrus and subsequent fertility of sows when litter size suckled was reduced to five piglets, split weaning was done at 7 and 14 days before full weaning (42 days). Sows were be assigned at the time of parturition to be either split weaned (n=12) or to serve as controls (n=6). Sows were split weaned by removing the heaviest piglets at 28 days of lactation, leaving five to seven piglets with the sow until full

weaning at 7 and 14 days later. Control litters were weaned at 56 days of lactation. Breeding of Sows were done at the first observed estrus after weaning. The data generated were analysed analysis with the help of SPSS.

Results and Discussion

Three split weaning groups of Ghungroo piglets i.e 28th day (T_1) and 35th day (T_2) and Control group i.e 56thday (T_0) were designed in the present study to see its effect on different aspect of sow and piglet performances as mentioned in Table (1).

The birth weight of piglets recorded in different weaning age groups in T_1, T_2 and T_0 were 0.94±0.04, 0.91±0.03 and 0.95±0.04 kg, respectively. Piglet weight at weaning was significantly (P<0.05) higher in T_0 (10.48±0.56 kg) as compared to T_1 (3.31±0.08 kg) and T_2 (4.63±0.17 kg) as well as significant differences have been observed w.r.t piglet weight at 8 weeks of age with T_0 (10.48±0.56 kg) and T_1 but no significant differences between T_1 (8.45±0.49 kg) and T_2 (8.50±0.46 kg).

Highest piglet mortality has been recorded in T_0 (30.10%) as compared to T_1 (12.70%) and T_2 (7.50%) groups. Weaning to estrus interval (days) was significantly (P<0.05) lower in T_1 (9.5±1.21) compared to T_0 (19.75±1.25) and did not differ with T_2 (11.63±1.12). Farrowing interval in days was significantly (P<0.05) lower in T_2 (159±9.64) compared to T_0 (205±12) and did not differ with T_1 (164.50±8.50).

Littersize found at birth in T_1, T_2 and T_0 were 7.25±0.80, 10±0.94 and 7.5±1.24, respectively. Significant differences were also noted in terms of littersize at weaning with lowest littersize at weaning in T_0 (5.5±1.05) and highest in T_2 (9.25±0.96) and lower in T_1 (6.5±0.25) as compared to T_2 group. The lowest littersize at weaning in T_0 group may be to managemental problem. Significant difference in littersize observed at subsequent farrowing between T_1 & T_2 and whereas no significant difference in littersize observed at subsequent farrowing between T_2 and T_0.

Split weaning practices reduces WEI in weaned sow without affecting littersize and litter weight at subsequent farrowing [Saikia *et al*., 2017] [5]. The weaning to estrus interval (WEI) in the present study was found to be 9.5±1.21, 11.63±1.12 and 19.75±1.25 days in T_1, T_2 and T_0, respectively. Significant differences were found between T_1 group and T_3 group. Significant differences between T_2 and T_3 groups were also observed. No significant differences were observed between T_1 and T_2 groups. Similarly, it was reported that sows split weaned 5 days before full weaning had no differences in WEI from sows split weaned 6 or 7 days before full weaning [Tarocco *et al*., 2000] [6]. It was found that split-weaned sows (T_1 and T_2 groups) in the present study tended to return to oestrus 10 days and 8 days earlier than control sow (T_0), respectively which is in contrast to the findings that split weaned sows tended to return to estrus one day earlier than control sow [Tarocco *et al*., 2000] [6]. The percentage of sows bred by day 8 (T_2) or day 10 (T_1) after weaning was greater when sows were split weaned 7 and 14 days before full weaning (42 days) than for control sows which is in contrast to the findings that there was much difference [Tarocco *et al*., 2000] [6]. It was found that split weaning of litters for up to 7 days before full weaning slightly advanced the onset of the post-weaning estrus. It was reported that early weaning at 28 or 35 weeks of age has advantage over late or traditional weaning at 42 or 56 days [Kalita *et al*., 2017] [3].

Table 1: Productive and Reproductive performance of Ghungroo sows

Particulars	Weaning Groups		
	T_1	T_2	Control (T_0)
Piglet Body weight at Birth (kg)	0.94±0.04	0.91±0.03	0.95±0.04
Piglet Body weight at weaning (kg) as group assigned	3.31±0.08^a	4.63±0.17^a	10.48±0.56^b
Piglet Body weight at 8th week of age (kg)	8.45±0.49^a	8.50±0.46^a	10.48±0.56^b
Piglet Mortality (%)	12.07^a	7.50^b	30.10^c
Weaning to estrus interval (days)	9.5±1.21^a	11.63±1.12^a	19.75±1.25^b
Farrowing Interval (days)	164.50±8.50^a	159±9.64^a	205±12^b
Littersize at Birth (no.)	7.25±0.80^a	10±0.94^b	7.5±1.24^a
Littersize at Weaning (no.)	6.375±0.75^a	9.25±0.96^b	5.5±1.05^c
Littersize at subsequent farrowing (no.)	6.5±0.25^a	8.33±1.03^b	8.5±1.5^b

*Means having different superscripts with in a row differs significantly (p<0.05)

Conclusion

Split weaning is one of the most important management strategies for economic piglet production as well as subsequent sow fertility. For this, farrowing house management plan must be developed to oversee the split weaning methods for optimum results. Significant differences were observed w.r.t productive and reproductive performances of ghungroo sows *viz*. weaning to estrus interval (days) at different time interval, Farrowing interval and subsequent littersize between the control group and treatment groups. The practice of split-weaning may increase the proportion of sows bred by 7-10 days after weaning thereby potentially increase herd fertility as well reduce piglet mortality.

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