



EFFECT OF LACTATION LENGTH ON REPRODUCTIVE PERFORMANCE OF LARGE WHITE YORKSHIRE SOWS*

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Abstract

Eighteen Large White Yorkshire (LWY) sows from Centre for Pig Production and Research, Mannuthy in last week of gestation were selected for the study. Lactation length of sows in treatment groups, T1, T2 and T3, were 42, 35 and 21 days respectively. Weaning to service interval in all three groups range from 3-8 days post-weaning. Pregnancy diagnosis after seven to eight weeks of mating revealed positive result irrespective of treatment. Lactation weight loss was highest in T1 (15.75 ± 1.62 kg) followed by T2 (11.90 ± 1.20 kg) and T3 (6.93 ± 1.08 kg). Body condition score at the time of weaning was 2.83 ± 0.31 , 3.00 ± 0.26 and 3.50 ± 0.22 for T1, T2 and T3, respectively. Farrowing interval in T1, T2 and T3 were 159.50 ± 0.99 , 158.00 ± 2.75 and 138.33 ± 0.42 days, respectively. Subsequent litter size in T1, T2 and T3, was 13.17 ± 1.01 , 11.17 ± 0.87 and 10.17 ± 0.48 respectively. Thus, reducing the lactation length could increase the number of farrowing per sow during its productive life.

Key words: Lactation length, Weaning to service interval, Body condition score, Farrowing interval, Subsequent litter size.

Swine farming has gained momentum and the intensification had transformed it into an industry. As pig is highly prolific, reproductive performance of sow plays an important role in the economy of farm. Various parameters like lactation length, weaning to service interval and farrowing interval had to be optimised for a superior performance of sows. Lactation length and management practices play an important role in weaning to conception interval (Cozler *et al.*, 1997). Longer lactation length can have various consequences in terms of reproductive efficiency of sow, as a result of which there will be higher weight loss and in turn, result in thin sow condition wherein, the sow will require longer duration to compensate the lactation weight loss. The outcome of this will be lesser number of farrowing per year. Prolonging the lactation

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length, have direct effect on farrowing interval, since farrowing interval is directly influenced by lactation length. Reducing lactation length reduces weaning to service interval and transmission of disease from dam to piglets can be reduced (Narayanan *et al.*, 2008). Thus, the aim of the study was to investigate the effect of lactation length on reproductive performance of Large White Yorkshire (LWY) sows.

Materials and Methods

The study was conducted at Centre for Pig Production and Research Mannuthy. Eighteen LWY sows in last week of gestation were selected weighed and assigned to three groups (T1, T2 and T3) and housed in a farrowing pen. Lactation length of sows in T1, T2 and T3 were 42, 35 and 21 days respectively. All sows were maintained with same ration throughout the experiment. Body weight and visual Body Condition Score (BCS) of sows were taken on the day of farrowing and weaning. Sows were shifted to loose housing system after weaning and were mated (natural mating) in first post weaning heat. Weaning to service interval was noted and pregnancy diagnosis was done 7-8 weeks after mating using pregnancy detector. Farrowing interval and subsequent litter size was noted. The data obtained on various parameters were statistically analysed by using SPSS Version 24.0.

Result and Discussion

Body weights of sows in T1, T2 and T3 on the day of farrowing and weaning were presented in table 1. There was a significant change in body weight of sows ($P < 0.01$) between T1 and T2 with T3. Similar result was

reported by Maes *et al.* (2004). Weight loss during lactation of T3 was akin to Patterson *et al.* (2011) who noted a weight loss of 7.1 ± 0.2 kg in sows weaned approximately 20 days post farrowing. Whilst, weight loss of T2 was similar to the observations of Lee *et al.* (2014) who noted a lactation weight loss of 10.03 ± 4.26 kg in multiparous Duroc sows with lactation length of 28 days. The weight loss of T1 group was as reported by Mageshram (2015) in LWY sows having a lactation length of 45 days with a weight loss of 17.80 ± 0.29 kg.

Visual BCS of sows in three treatments were furnished in table 2. A significant difference was noticed within the group in BCS of sows in T1 and T2. However there was no significant difference noticed between the groups. Sows in T2 and T3 have BCS of 3.00 ± 0.26 and 3.50 ± 0.22 respectively at the time of weaning which was in agreement with Muirhead and Alexander (1997). In the present finding BCS was better than that was reported by Maes *et al.* (2004) who found a BCS of 2.92 and 2.86 at the time of weaning on sows with a lactation length of 21 and 28 days, respectively. Irrespective of lactation length, BCS of T1, T2 and T3 was higher than a score of 2.3 ± 0.01 in sows with a lactation length of 19 days as reported by Schenkel *et al.* (2010).

Weaning to service interval in T1, T2 and T3 were 3.667 ± 0.80 , 8.83 ± 3.12 and 3.167 ± 0.48 days, respectively. There was no significant difference between the groups. This was in contradiction with Tummaruk *et al.* (2000) and Lesskiu *et al.* (2015), who reported a shorter weaning to service interval with longer lactation length.

Table 1. Body weight of sows at farrowing and weaning

Parameters	Treatments			F value	P value
	T1	T2	T3		
Initial body weight (kg)	159.67±9.94	161.33±11.57	156.17±7.17	0.07 ^{ns}	0.93
Body weight at weaning (kg)	141.92 ± 10.98	147.68 ± 11.71	147.33 ± 6.90	0.10 ^{ns}	0.90
Change in body weight (kg)	15.75 ± 1.62 ^a	11.90 ± 1.20 ^a	6.93 ± 1.08 ^b	11.19 ^{**}	0.00

ns – Non significant ($P > 0.05$); ** significant at 0.01; Means having same letters as superscript within a row are homogeneous

Table 2. Visual Body Condition Score

Treatments	Body Condition Score (B.C.S)		Z value	P value
	Initial	Day of weaning		
T1	3.83 ± 0.31	2.83 ± 0.31	2.45**	0.01
T2	3.83 ± 0.31	3.00 ± 0.26	2.24*	0.03
T3	3.67 ± 0.21	3.50 ± 0.22	1.00 ^{ns}	0.32
χ ² value	0.18 ^{ns}	3.21 ^{ns}		
P value	0.912	0.21		

ns – Non significant ($P > 0.05$); ** significant at 0.01; *significant at 0.05 level

Table 3. Weaning to service interval, farrowing interval and weaning to subsequent litter size

Parameters	Treatments			F value	P value
	T1	T2	T3		
Weaning to service interval (days)	3.67 ± 0.80	8.83 ± 3.12	3.17 ± 0.48	2.78 ^{ns}	0.094
Farrowing interval (days)	159.50 ± 0.99 ^a	158.00 ± 2.75 ^a	138.33 ± 0.42 ^b	47.77**	<0.001
Subsequent litter size (No.)	13.17 ± 1.01	11.17 ± 0.87	10.17 ± 0.48	3.47 ^{ns}	0.058

ns – Non significant ($P > 0.05$); ** significant at 0.01; Means having same letters as superscript within a row are homogeneous

Shorter lactation length did not compromise the reproductive performance of sows in T3, which was in accordance with Takai and Koketsu (2007). Weaning to service interval in T1 and T3 were shorter and T2 was longer than that recorded by Schenkel *et al.* (2010) who reported weaning to service interval of 5.5 days in sows with a lactation length of 19 days. Patterson *et al.* (2011) also noted a weaning to service interval of 5 ± 0.2 days in Landrace X Large White Yorkshire sows weaned approximately 20 days post farrowing. However, Chen (2012) found that lactation length did not have effect on weaning to service interval.

Pregnancy diagnosis of sows in all treatments was positive. This was in agreement with Ronald *et al.* (2013) who found that sows mated by natural service as well as by artificial insemination have 100 per cent conception rate. However, in contrast to this, Am-in *et al.* (2010) reported that sows bred by artificial insemination had less non-return rate and higher farrowing rate compared to naturally bred sows.

Farrowing interval T1, T2 and T3 were 159.67 ± 0.80, 157.83 ± 3.16 and 138.17 ± 0.48 respectively as presented in table 3. There was

a significant difference ($P < 0.01$) in farrowing interval between T1 and T2 with T3. Shorter farrowing interval in T3 was due to short lactation length which is in agreement with Jayashree and Sivakumar (2013) and Ravi *et al.* (2013). There was no significant difference between T1 and T2 in farrowing interval. Subsequent litter size of T1, T2 and T3 were presented in table 3. Statistically there was no significant difference between the groups. However T1 had a maximum number of piglets followed by T2 and T3. Similar findings were reported Correa *et al.* (2014) and Bruun *et al.* (2016). Subsequent litter size in T2 was more than T3, though weaning to service interval was within 5-10 days. This was in contradiction to Karvelienė *et al.* (2008) who reported that minimum number of piglets was observed when weaning to service interval lies within 5-10 days post weaning. Thus, lactation length might have more significant effect on the subsequent litter size than weaning to service interval.

Sows with a lactation length of 42 and 35 days lost more body weight during the course of lactation compared to sows with lactation length of 21 days. The BCS of sows in

shorter lactation length was better than sows with longer lactation length. Weaning to service interval was similar irrespective of lactation length. The outcome of natural mating have 100 per cent conception rate. Shorter the lactation length shorter is the farrowing interval. Subsequent litter size was higher in sows with longer lactation length. However reducing the lactation length leads to more farrowing per sows during its reproductive life.

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