# Effects of Feeding Levels During the Pre- and Post-mating Period on Reproductive Performance of Sows[1]

Chung-Wen Liao[2] and Fang-Jaung Liu[3]

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## Abstract

The purpose of this study was to evaluate the effects of feeding levels during pre- and post-mating period on reproductive performance of sows. A total of forty one 2nd parity sows were used in this experiment. After weaning for the first parity, sows were fed daily either 2 kg or 3 kg of diet from weaning to mating. From day of mating to day 30 post-mating, the previous two feeding levels groups were subdivided into two groups and fed either 2 kg or 3 kg of diet per day. A total of 4 feeding level groups were formed. After 30 days post-mating, each sow was fed 2 kg/d till farrowing. The reproductive performance of sows and growth of piglets were evaluated. The results showed that sows provided 3 kg/d of diet from weaning to mating and day 30 post-mating could significantly increase weight gain of the sows than the other groups ($P<0.05$). The feeding levels have no effect on the body weight of newborn piglet, weaning weight or weight gain during the lactating period. There was no dietary effect on backfat thickness of sows from weaning to mating or days 30 post-mating. However, it tended to increase the litter size at birth. The litter size for the sow fed 3 kg per day during the pre- and post-mating period was numerically larger when compared to the other groups.

Key words : Sow, Pre- and Post-mating, Feeding level, Reproductive efficiency.

## Introduction

Low reproductive efficiency of sow is a major factor limiting breeding efficiency of the pig. The embryo mortality of sows during the pregnancy can reach 30～40% (Lambert,

(1) Contribution No. 1072 from Taiwan Livestock Research Institute, Council of Agriculture.
(2) Livestock farm, LOA-TLRI, Hsinhaw, Tainan, Taiwan, R.O.C.
(3) Department of Animal Nutrition, LOA-TLRI, Hsinhaw, Tainan, Taiwan, R.O.C.

1981). The conclusion on the effect of feeding levels around the mating period on the early embryo survival is still inconsistent (Dyck and Strain, 1983; Britt *et al.*, 1993; Liao and Veum, 1994). Liao and Veum (1994) found that the percentage of embryo survival of primiparous sows fed 2.7 kg of feed from day 3 to 30 post-mating was greater than fed 1.8 kg/d. Dyck and Strain (1983) reported that high levels of energy intake after mating were detrimental to embryo survival in gilts. Dyck and Kennedy (1995) found that there was no effect on embryo survival of sows when fed 2.5 kg/d or 1.25 kg/d during 1～20 days after mated. Increase of the feed level during day 10 to 14 within estrous cycle could increase the ovulation rate and simultaneously embryo mortality (Pharazyn *et al.*, 1991). ARC (1981) suggested that if the lactating sow had experienced greater body weight loss and restricted feeding after weaning, that could be detrimental to embryo survival on next reproductive cycle. Brook and Cole (1972) reported that if the sows had greater backfat loss at previous lactation, the provision of greater feed at 3.6 kg/d postweaning was helpful to their return to estrus and had larger litter size on subsequent parity. In Taiwan, the sows were often offered reduced feed during the interval of weaning to occurrence of estrus. It is not known whether this feeding practice for those sows that suffered greater body weight and fat losses was appropriate. The objective of these experiments was to study the effect of the feeding levels during the pre-mating period and 30 days post-mating on the reproductive performance of sow and growth of the piglets.

## Materials and Methods

I. Experiment materials

(i) Experimental animals: A total of 41 crossbred gilts (Landrace × Yorkshire) were used.

(ii) Feed treatments: Feed was formulated by corn soybean meal which contained 14% crude protein and ME 3,100 kcal ME/kg.

II. Experiment methods

(i) Sow and piglets management: The gilts were bred and finished the first parity. After weaning at the first reproductive cycle, sows were divided into two groups according to weaning order and fed 2.0 kg/d or 3.0 kg/d respectively till attaintment of estrus and mating. After mating, the previous groups were sub-divided into 2.0 kg/d and 3.0 kg/d feeding level groups respectively. Four groups of feeding levels were obtained. After 30 days post-mating, sows were applied on the general feeding practice and each sow was fed 2.0 kg/d till farrowing. The lactating sows were fed on an *ad. libitum* basis. The piglets were provided creep feed from d14 postfarrowing. Piglets were weaned on d 28±2 postfarrowing and body weight were measured.

(ii) Items measured: During the period of weaning to mating and day 30 post-mating, Body weight and backfat thicknes were measured. After farrowing, the litter size, birth weight of newborn piglet, weaning weight and litter size at weaning, survival rate were collected.

(iii) Statistical analysis: All data collected were analyzed by analysis of variance as a completely randomized design (CRD) with one way treatment. The difference between treatments was detected by least square difference (LSD). Treatments were combination of feeding level, i.e. two levels during weaning to mating and two levels during mating to day 30 postmating. Experimental unit was individual sows. All procedures of statistical analysis was computed using General Linear Model by Statistical Analysis System (SAS, 1999).

## Results and Discussion

The effects of feeding levels during the pre- and post-mating period on weight gain of sows is shown in Table 1. The weight gain of sows fed 3 kg/d were significantly greater than those of fed 2 kg/d from weaning to mating ($P<0.05$). From weaning to mating and from mating to day 30 post mating, the weight gain of sows that fed 3 kg/d was greater ($P<0.05$) than the other groups. From weaning to mating and day 30 post mating, the feeding levels of sow had no effect on the weaning weight of piglets or the weight gain in lactating period (Table 2). The number of piglets born increased numerically when sows were fed 3 kg/d during the pre- and post-mating period. There was higher survival rate for piglets from the sows provided increased feed during the critical period of return to estrus. The improvement of embryo survival with increased feed postmating was also observed by Liao and Veum (1994) and Brook and Cole (1972). Rozeboom et al. (1993) showed that the embryo survival had decreased with limited feeding in gilts and sows during early pregnancy. ARC (1981) suggested that if the lactating sow had suffered great body weight loss and restricted feeding after weaning, that could be detrimental to embryo survival on next reproductive cycle. The greater weight loss and the thin sow syndrome was prominent in Taiwan due to the adverse environment effect (Liao and Hsu, 1987). One reason for adopting a high plane of nutrition during the premating period and early pregnancy would be to increase the ovulation rate and replenish body tissue lost in the previous lactation (Robinson, 1986). The effects of feeding level on backfat thickness of sow during the pre- and post-mating period are shown in Table 3. The feeding levels of sows from weaning to mating and to day 30 post-mating had no effect on the backfat thickness loss of sows. In general, the increase of the feed intake during the pre and post-mating period had no effect on the litter size or weight at birth.

Table 1. The effects of feeding level during the pre- and post-mating period on weight gain of sow

| | Feeding levels, kg/d | | | | |
|---|---|---|---|---|---|
| From weaning to mating | 2 | 2 | 3 | 3 | |
| To day 30 post mating | 2 | 3 | 2 | 3 | SEM |
| Number of sows | 11 | 9 | 10 | 11 | |
| Body weight at weaning, kg | 168.1 | 175.8 | 168.2 | 167.9 | 5.1 |
| Body weight at mating, kg | 169.8 | 179.1 | 174.5 | 173.1 | 5.5 |
| Weight at d 30 after mating, kg | 180.3 | 193.8 | 184.9 | 193.6 | 5.6 |
| Weight gain from weaning to mating, kg | 1.78[a] | 3.21[a] | 5.25[b] | 5.20[b] | 1.63 |
| Weight gain from mating to day 30 after mating, kg | 10.5[a] | 14.7[a] | 10.4[a] | 20.5[b] | 1.7 |
| Weight gain from weaning to day 30 after mating, kg | 12.2[a] | 18.0[bc] | 16.7[ac] | 25.7[d] | 2.4 |

a,b,c,d : Mean in same row with different superscripts differ significantly ($P<0.05$).

Table 2. The effects of feeding level of sow during the pre- and post-mating period on piglet performance

| | Feeding levels, kg/d | | | | |
|---|---|---|---|---|---|
| From weaning to mating | 2 | 2 | 3 | 3 | |
| To day 30 post mating | 2 | 3 | 2 | 3 | SEM |
| Number of piglets born | 8.9 | 9.5 | 9.8 | 9.9 | 1.7 |
| Number of piglets at weaning | 8.13 | 8.44 | 9.23 | 9.70 | 0.7 |
| Survival rate, % | 91 | 88 | 94 | 98 | 2.3 |
| Birth weight, kg | 1.42 | 1.40 | 1.31 | 1.37 | 0.71 |
| Weaning weight, kg | 8.37 | 8.68 | 7.63 | 8.15 | 0.39 |
| Weight gain of piglet during the lactating period, kg | 6.95 | 7.28 | 6.32 | 6.78 | 0.64 |

Table 3. The effect of feeding levels during the pre- and post-mating period on backfat thickness of sows

| | Feeding levels, kg/d | | | | |
|---|---|---|---|---|---|
| From weaning to mating | 2 | 2 | 3 | 3 | |
| To day 30 post mating | 2 | 3 | 2 | 3 | SEM |
| Backfat thickness, mm | | | | | |
| At weaning | 17.1 | 18.8 | 18.4 | 18.6 | 0.70 |
| At mating | 18.6 | 20.1 | 18.6 | 19.4 | 0.72 |
| Day 30 post mating | 20.2 | 22.1 | 20.5 | 21.0 | 0.63 |
| Backfat change from weaning to mating, mm | 1.50 | 1.30 | 0.2 | 0.8 | 0.86 |
| Backfat change from mating to day 30 postmating, mm | 1.80 | 2.00 | 1.90 | 1.60 | 0.67 |

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# 母豬於配種前後飼料供餵量對繁殖性能及仔豬生長性能的影響(1)

廖宗文(2)　劉芳爵(3)

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## 摘　要

本研究之目的在探討母豬於配種前後之飼料供餵量對繁殖性能及仔豬生長之影響。總數 41 頭之母豬，分成兩組，於完成第一產次之哺乳後離乳，離乳至再發情配種期間，每日每頭分別餵飼 2.0 kg 及 3.0 kg 懷孕期飼料，於配種後至 30 日期間，前述之兩餵飼組再分別分成日餵 2.0 kg 及 3.0 kg，共形成四種餵飼量組合，母豬於配種後 30 日恢復一般飼養方式，每頭日餵給 2.0 kg 飼料，測定母豬之體重及背脂厚度以及繁殖性能。結果顯示，母豬自離乳至再發情期間以及配種至配種 30 日期間，皆日餵 3 kg 者，其增重顯著地（P＜0.05）比其他各組為大，不同飼料餵量餵飼對仔豬出生重，離乳重及哺乳期仔豬增重，並無顯著之影響，然而母豬於離乳至配種期間以及配種至配種後 30 日皆日餵 3.0 kg 之懷孕期飼料者，其出生窩仔豬數，有較大的趨勢。

關鍵詞：母豬、配種前後時期、飼料餵量、繁殖效率。

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(2) 行政院農業委員會畜產試驗所畜牧場。
(3) 行政院農業委員會畜產試驗所家畜營養系。