Feeding strategies during the lactation period for first-parity sows

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Genest, M. and D'Allaire, S. 1995. **Feeding strategies during the lactation period for first-parity sows**. Can. J. Anim. Sci. **75**: 461–467. The effects of different feeding regimes during the lactation period on feed intake, body reserves and sow performance were evaluated. A 2 × 2 factorial design was used and 183 first-parity sows were randomly allocated to one of four treatments: sows were fed either two or three meals per day with (wet feed) or without (dry feed) supplemental water at meal time. Primiparous sows were fed ad libitum 12–16 h after parturition. The addition of water at meal time increased ($P < 0.01$) feed consumption by 5% over the 18-d lactation period. Increased feeding frequency did not influence feed intake. During the first week of lactation, most sows gained weight, but thereafter lost weight, with the rate of weight loss reaching a peak during the last week of lactation. Although feed intake was influenced only by wet feeding, both an increased frequency of daily meals and the use of wet feeding reduced mobilization of body reserves. Wet-fed sows lost less weight than dry-fed sows and the increased feeding frequency reduced backfat loss. Average daily gain of piglets, percentage of sows with a weaning-to-estrus interval of less than 7 d, farrowing rate, and parity-2 litter size were similar among the four groups. A lack of significant improvement in sow performance with different regimes may be partly related to a generally high feed intake and minimal weight and backfat losses. Although our results failed to show a benefit on sow performance, we believe that some of the feeding strategies evaluated could be useful during periods in which sows eat less, such as in the summer, or in some herds that have feed consumption problems.

Key words: Sow, feed intake, weight, backfat, reproductive performance

Genest, M. et D'Allaire, S. 1995. **Evaluation de différentes stratégies alimentaires en période de lactation chez les truies primipares**. Can. J. Anim. Sci. **75**: 461–467. L'effet de différentes stratégies alimentaires en période de lactation sur la consommation et les performances des truies a été évalué. Une approche factorielle 2 × 2 a été utilisée et 183 primipares ont été allouées au hasard à l'un des quatre traitements suivants: les truies étaient nourries deux ou trois fois par jour avec ou sans addition d'eau au moment du repas. Les primipares étaient nourries à volonté dès 12 à 16 h après la parturition. L'ajout d'eau au moment du repas a augmenté ($P < 0,01$) la consommation alimentaire de 5% pour la durée totale de la lactation. La fréquence des repas n'a pas influencé la consommation alimentaire. Pendant la première semaine de lactation, la plupart des truies ont pris du poids, pour en perdre par la suite, la perte étant plus prononcée durant la dernière semaine de lactation. La mobilisation des réserves corporelles était réduite lorsque la fréquence des repas était augmentée et que l'alimentation était de type humide, bien que la consommation alimentaire n'était influencée que par le mode d'alimentation humide. Les truies alimentées de façon humide ont perdu moins de poids que les truies nourries avec un aliment sec et l'augmentation de la fréquence des repas a réduit la perte de gras dorsal. Le gain moyen quotidien des porcelets, le pourcentage de truies avec un intervalle sevrage-oestrus inférieur à 7 j, le taux de mise bas et la taille de la deuxième portée étaient similaires pour les quatre groupes. Il est suggéré que l'absence d'effet significatif sur les performances de la truie des différents traitements évalués peut être en partie attribuable à la consommation alimentaire très élevée pour des primipares et aux pertes minimales de poids et de gras dorsal chez ces truies. Il est donc possible que certaines de ces stratégies puissent être utiles durant certaines périodes où la consommation alimentaire est moindre, comme en été, ou dans des troupeaux aux prises avec des problèmes de consommation.

Mots clés: Truie, consommation alimentaire, poids, gras dorsal, performance reproductive

It is well established that a low level of feed consumption during the lactation period is associated with a low milk production and a decrease in fat and muscular reserves (O'Grady et al. 1973; Noblet and Etienne 1987). Furthermore, an excessive loss of body reserves results in a longer weaning-to-breeding interval, a low conception rate and a smaller litter size at the subsequent farrowing (King and Williams 1984; Cole 1990). All of these may affect sow longevity in the herd. Primiparous sows are more vulnerable because of their growth requirements and because their voluntary feed intake is generally lower than that of multiparous sows during the lactation period. Consequently, any feeding practices that will improve feed intake in first-parity sows, could potentially increase the productivity of the herd.

The use of wet feeding was reported to increase feed consumption in sows (O'Grady and Lynch 1978; Danielsen and Nielsen 1984). Another suggested measure to improve feed intake has been to increase the frequency of meals (Libal and Wahlstrom 1983; NCR–89 1990; Weaver and Aherne 1993). However, results of these studies were not consistent. The purpose of this study was to evaluate the effects of increasing the daily frequency of feeding and supplying water at meal time during the lactation period on feed consumption and reproductive performance of primiparous sows.

Abbreviations: **ADG**, average daily gain

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MATERIALS AND METHODS

One hundred and eighty-three Large White × Landrace females were divided into four groups. Four feeding methods during the lactation period were evaluated in a 2 × 2 factorial arrangement consisting of either two or three meals per day and with (wet feed) or without (dry feed) supplemental water added to the feed. All the sows farrowed their first litter between 1 March and 28 April 1993. At mating, stratifying on liveweight, the gilts were randomly allocated to one of the four groups. Gilts were mated twice at their second observed estrus at an average of 128 kg (± 9) and were transferred into gestation crates after mating. They were fed once a day, by an automatic feeder, a corn-soybean meal diet formulated to provide 11.8 MJ ME kg^{-1}, 14% crude protein, and 0.63% lysine (Table 1). Sows received 2.2 kg d^{-1} from mating to day 90 of gestation and 2.5 kg d^{-1} for days 90–108.

Gilts were moved to farrowing crates at 108 d of gestation. From day 108 to day 112, gilts were fed 2.5 kg d^{-1} of a lactation diet (Table 1) containing 13.7 MJ ME kg^{-1}, 15% crude protein, and 0.89% lysine. They received 2, 1.5, and 1 kg on day 113, 114, and 115, respectively. Parturition was induced by the use of synthetic prostaglandins at 115 d of gestation. Each farrowing room contained 21 crates and was run in an all-in all-out fashion. Within a farrowing room, there were two groups of sows fed an identical number of meals per day, 2 or 3, one group received supplemental water at meal time, whereas the other did not. Sows were fed at 07:30 and 16:30 and those fed thrice a day received their additional meal at 11:30.

Primiparous sows were fed ad libitum 12–16 h after parturition. Feed distribution was closely monitored and, to ensure that sows were fed to appetite, some feed had to be left in the trough by the time of the next meal. The amount of feed distributed was measured at every meal and feed refusals were dried and weighed to determine the daily consumption. Feed intake was weighed from days 1 to 18 after farrowing. All sows had continuous access to water through a nipple drinker with a flow rate of 4 L min^{-1} which was located on the side 12 cm from the bottom of a deep trough. Supplemental water, delivered at meal time to the wet-fed sows, was controlled by computer and was distributed at the rate of 1.5 L kg^{-1} of feed in two parts at 10-min intervals during the meal.

Sow weight and backfat depth at P2 (6.5 cm from midline at the last rib, determined ultrasonically, Ultra-Sonomatic U76A FM1) were recorded at mating, 108 d of gestation, 1, 7 and 14 d after parturition, and at weaning. Cross-fostering of piglets was only allowed within 24 h of parturition. The number of nursing piglets was standardized according to the average number of piglets born per litter in each farrowing room. Litters were weighed at 24 h and 3, 7, 14, and 20 ± 1 d of age. Litter weight was adjusted at 21 d using a regression equation to take into account the variation in weaning age. Average piglet weight and weight gain were then calculated. Causes of piglet death were noted. No creep feed was given to piglets during the experimental period.

At weaning, sows were moved to the breeding area into crates adjacent to a penned mature boar. Detection of estrus was done by exposing sows to boars for 15 min d^{-1} until mating or for a maximun of 42 d postweaning. First-parity sows were bred by a boar at the onset of estrus and artificially inseminated with fresh semen 24 h later. Detection of returns to estrus and pregnancy diagnosis were performed at 21 and 35 d postmating, respectively. The weaning-to-estrus interval, conception rate, reason for culling, and litter size at parity 2 for sows bred at first mating were recorded. The reproductive tracts of all sows that were culled for anestrus were examined at slaughter for evidence of cycling. Sows were fed 2.5–3 kg d^{-1} of the gestation diet from weaning until mating. Thereafter, they received 2.2 kg until day 90 and 2.5 from days 90 to 108.

The environmental conditions were well controlled; temperature was maintained at 20°C in the farrowing rooms and at 17°C in the breeding and gestation areas. The experiment was conducted in a multiplier and high health herd that had just been started. The pigs used in this study were cared for according to the guidelines of the Canadian Council on Animal Care.

Statistical analyses were performed according to the General Linear Models procedure of the SAS Institute, Inc. (1984). The overall model included the main effects of wet feeding and daily meal frequency and interaction effects. Weight and backfat thickness at 24 h after farrowing were used as covariables in the analyses of response criteria, since they accounted for a significant proportion of the variation for most response criteria. Chi-square analysis was used to test for treatment effects on the proportion of sows with a weaning-to-estrus interval of less than 7 d, the farrowing

Table 1. Composition of diets

	Gestation	Lactation
Ingredients (kg t^{-1})		
Corn	411.5	470.5
Wheat	–	200
Wheat shorts	200	42
Barley	160	–
Soybean hulls	90	50
Soybean meal (48%)	60	120
Meatbone meal	35	40
Animal fat	10	45
Dicalcium phosphate	15	11
Limestone	9	10
Iodized salt	4	4
Mineral-vitamin premix[z]	5.5	5.5
Lysine HCL	–	2
Composition (as fed)		
Metabolizable energy (MJ kg-1)[y]	11.8	13.7
Crude protein, N × 6.25, (%)	14.1	15.4
Ether extract (%)	3.8	7.1
Calcium (%)	1.0	1.0
Phosphorus (%)	0.8	0.7
Lysine (%)	0.63	0.89

[z]Provided the following amounts per kilogram of diet: cobalt, 0.6 mg; copper, 25 mg; iodine, 1.0 mg; iron, 125 mg; manganese, 50 mg; selenium, 0.3 mg; zinc, 150 mg; vitamin A, 13 500 IU; biotin, 0.45 mg; choline, 600 mg; niacin, 35 mg; pantothenic acid, 19.0 mg; riboflavin, 8.0 mg; vitamin B12, 0.03 mg; vitamin D3, 2000 IU; vitamin E, 50 IU; vitamin K, 5.0 mg; pyridoxin, 2.0 mg; folic acid, 3.0 mg; thiamin, 2.0 mg.
[y]Calculated

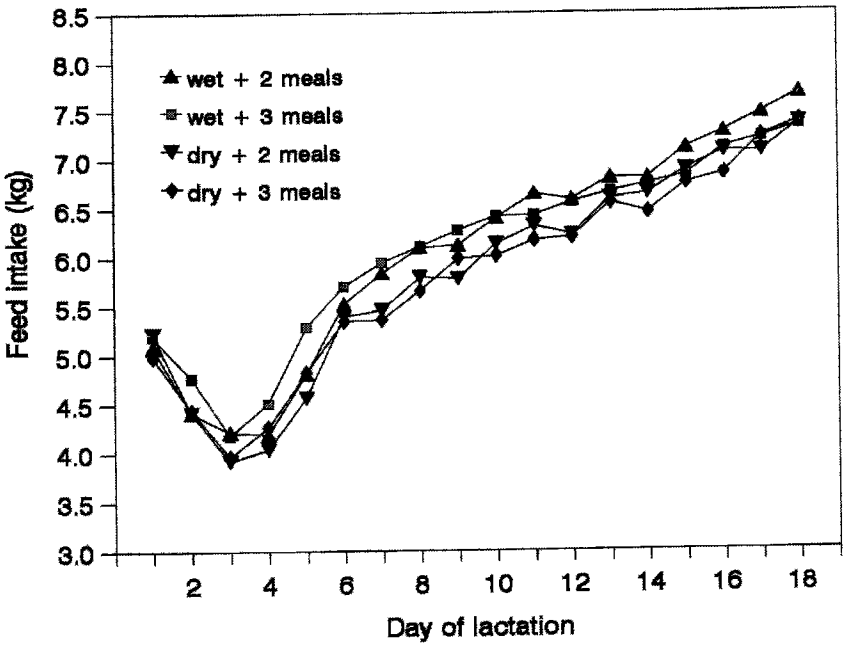

Fig. 1. Daily feed intake (kg) during the lactation period in primiparous sows fed two or three times a day and with (wet) or without (dry) supplemental water at meal time

rate, and the proportion of sows having a second litter. Statements regarding significance are at $P < 0.05$ unless stated otherwise.

RESULTS

Feed intake at day 1 of lactation was around 5 kg but was lower for the subsequent 4 d (Fig. 1). The decrease was only significant at day 3 ($P = 0.0001$), with 50% of the sows having their feed intake lowered by more than 25%. Thereafter, daily consumption increased as the lactation progressed. The addition of water at meal time increased feed consumption by 5 kg for an 18-d lactation period (Table 2). A significant difference was observed for all the periods except from days 15 to 18 ($P = 0.0740$). The daily feeding frequency did not influence feed consumption (Table 2).

Sows were bred at an average weight of 128 kg (± 9 SD) with a backfat thickness of 16.2 mm (± 3.9 SD). At parturition, they weighed 174 kg (± 15 SD) and had 23.2 mm of backfat (± 5.5 SD). Although gilts were fed the same amount of feed during the gestation period and weight and backfat at mating were similar, sows that were wet-fed twice a day gained significantly more weight and backfat than other sows. During the first week of lactation, most sows gained weight, but thereafter lost weight, with the rate of weight loss reaching a peak during the last week of lactation (Table 3). Wet-fed sows lost less weight than dry-fed sows during the lactation period. The backfat loss was influenced by the number of daily meals but not by the addition of water to the feed (Table 4). An increased feeding frequency reduced the backfat loss even though the total feed consumption was similar.

The number of nursing and weaned pigs per litter was 10.29 (± 0.80 SD) and 9.96 (± 0.99 SD), respectively. There was no significant difference among treatments. Piglet mortality averaged 3.2%; the main causes of death were crushing and complications following castration. Litter performances for each treatment group are reported in Table 5. The ADG of piglets among treatment groups was not significantly different (235 and 241 g d^{-1}). Reproductive performances of sows were not affected by the different treatments (Table 6). No interaction between feeding frequency and form of diet was found for any of the variables studied.

DISCUSSION

Feed intake of gilts during the gestation period should provide sufficient nutrient intake to satisfy the requirements of the developing litter and ensure a targeted weight gain. Because of differences in nutrient intake and nutrient output during lactation, body reserves may be used during the lactation to compensate for the deficit in energy and protein that usually occurs during that period. The diet used in our study for the gestation period was according to the recommendations of Noblet and Etienne (1987) and Institut National de Recherches Agronomiques (1989) and allowed a weight and backfat gain of 45–49 kg and 6–8 mm, respectively during the gestation. A weight of approximately 160 kg and a backfat thickness of 18–22 mm at farrowing with a weight gain during gestation of 25–50 kg have been recommended for first-parity sows [National Research Council 1988; Yang et al. 1989; Young et al. 1990; Institut technique du porc (ITP) 1991].

Although sows were mated at a similar weight and backfat, were randomly allocated to one of the treatments, and were fed the same amount per day during the gestation peri-

Table 2. Feed consumption by period during the lactation period in primiparous sows fed two or three times a day with (wet) or without (dry) supplemental water at meal time. Least-square means ± SEM

	Wet feeding effect			Meal frequency effect		
	Wet meal	Dry meal	*P*	2 meals	3 meals	*P*
1–7	35.98 ± 0.54	32.97 ± 0.55	0.0103	33.55 ± 0.54	34.40 ± 0.54	>0.1
8–14	45.51 ± 0.49	43.15 ± 0.50	0.0011	44.49 ± 0.50	44.17 ± 0.49	>0.1
15–18	29.08 ± 0.33	28.33 ± 0.34	0.0740	28.92 ± 0.33	28.39 ± 0.33	>0.1
Total	109.57 ± 1.10	104.35 ± 1.13	0.0013	106.96 ± 1.12	106.96 ± 1.11	>0.1

Table 3. Variation of liveweight (kg) during the lactation period in primiparous sows fed two or three times a day with (wet) or without (dry) supplemental water at meal time. Least-square means ± SEM

	Wet feeding effect			Meal frequency effect		
	Wet meal	Dry meal	*P*	2 meals	3 meals	*P*
1–7	+1.81 ± 0.60	+0.34 ± 0.61	0.0910	+1.66 ± 0.60	+0.48 ± 0.60	>0.1
8–14	-0.84 ± 0.51	-1.58 ± 0.52	>0.1	-1.77 ± 0.51	-0.65 ± 0.51	>0.1
15–18	-3.62 ± 0.42	-3.88 ± 0.43	>0.1	-3.65 ± 0.42	-3.85 ± 0.42	>0.1
Total	-2.65 ± 0.89	-5.12 ± 0.91	0.0565	-3.75 ± 0.90	-4.02 ± 0.90	>0.1

Table 4. Variation of backfat thickness (mm) during the lactation period in primiparous sows fed two or three times a day with (wet) or without (dry) supplemental water at meal time. Least-square means ± SEM

	Wet feeding effect			Meal frequency effect		
	Wet meal	Dry meal	*P*	2 meals	3 meals	*P*
1–7	-0.01 ± 0.03	-0.04 ± 0.04	>0.1	+0.01 ± 0.04	-0.07 ± 0.04	0.0987
8–14	-0.31 ± 0.08	-0.39 ± 0.08	>0.1	-0.46 ± 0.08	-0.23 ± 0.08	0.0394
15–18	-0.72 ± 0.10	-0.84 ± 0.11	>0.1	-0.94 ± 0.10	-0.62 ± 0.10	0.0334
Total	-1.04 ± 0.16	-1.27 ± 0.16	>0.1	-1.38 ± 0.16	-0.92 ± 0.16	0.0411

od, sows assigned to the group wet-fed twice a day in lactation gained significantly more weight and backfat than other sows during gestation. Since weight and body fat at parturition influence voluntary feed intakes during the lactation period (Henry and Etienne 1978; O'Grady et al. 1985; Mullan and Williams 1989), weight and backfat at farrowing were used as covariables in the analyses.

Feed intake 24 h after parturition was high (5 kg) and could be related to the short prefarrowing period in which feed was restricted. Although a lower feed consumption was observed in all groups of sows over the following 4 d, the decrease was only significant at day 3 and averaged 1 kg less than the day 1 value, resulting in a daily intake of 4 kg. A decrease of more than 25% in feed intake was observed in only half the sows. Stahly et al. (1979) also noted a decreased feed consumption in some ad libitum fed sows during that period. However, from our results, it appears that most sows, at least for the genotype that was used in our study, will regain appetite quickly.

The average daily feed intake (6 kg) obtained for an 18-d lactation period in our study was high for first-parity sows, especially considering this short lactation period, and this might be partly associated with the ad libitum feeding regime offered shortly after farrowing. Williams and Mullan (1989) suggested that it is highly unlikely for a sow weighing 160 kg postpartum to reach an average intake above 5 kg d^{-1} and that consequently a weight loss during lactation is inevitable since sows will maintain their milk production at the expense of maternal body reserves. In several experiments, feed consumption for ad libitum fed primiparous sows was reported to be between 3.5 and 5.2 kg d^{-1} (Lynch 1988; Mullan and Williams 1989; Yang et al. 1989; Young et al. 1990). Feed intake in the current study was also above that observed in most commercial herds, but comparison is difficult because feed intake is often restricted by producers during the first week of lactation (Ravel, D'Allaire, Bigras-Poulin, unpublished observations 1995). Although energy intake during the gestation period was slightly higher than what is currently recommended (27.3 vs. 26 MJ DE d^{-1}) to avoid feed consumption problems during the lactation period, it did not seem to have adverse effects on subsequent lactation feed intake in our study [Harker and Cole, unpublished data, cited by Cole (1989)].

The number of meals per day did not influence feed consumption, even though fresh food was offered more frequently and the presence of humans was increased. These results corroborate the findings of NCR–89 (1990), but do not support those of Libal and Wahlstrom (1983) who reported an increased daily intake of 15% in sows fed thrice versus once a day. Recently, Weaver and Aherne (1993) fed sows to appetite either 24 or two times per day. Feed intake was 15% lower in sows fed hourly (6.1 vs. 7.2 kg). The authors suggested that sows may prefer to eat at certain times of the day, possibly in the morning and late afternoon and that feed intake should be encouraged during these periods. Additional meals would then only served as a complement.

Table 5. Average birth weight and weight gain (kg) of piglets during the lactation period from primiparous sows fed two or three times a day with (wet) or without (dry) supplemental water at meal time. Least-square means ± SEM

	Wet feeding effect			Meal frequency effect		
	Wet meal	Dry meal	*P*	2 meals	3 meals	*P*
Birth weight	1.42 ± 0.03	1.40 ± 0.03	>0.1	1.44 ± 0.03	1.38 ± 0.03	>0.1
1–3	0.34 ± 0.01	0.34 ± 0.01	>0.1	0.34 ± 0.01	0.34 ± 0.01	>0.1
3–7	0.91 ± 0.02	0.90 ± 0.02	>0.1	0.92 ± 0.02	0.89 ± 0.02	>0.1
7–14	1.87 ± 0.03	1.87 ± 0.03	>0.1	1.91 ± 0.03	1.82 ± 0.03	0.0183
14–21[z]	1.91 ± 0.04	1.87 ± 0.04	>0.1	1.90 ± 0.04	1.88 ± 0.04	>0.1
1–21	5.03 ± 0.06	4.98 ± 0.06	>0.1	5.07 ± 0.06	4.93 ± 0.06	>0.1

[z]21-d adjusted weight.

Table 6. Reproductive performances of sows[z] fed two or three times a day with (wet) or without (dry) supplemental water at meal time during the first lactation period

	Wet feeding		Dry feeding	
Variables	2 meals *n*=47	3 meals *n*=47	2 meals *n*=43[y]	3 meals *n*=45
Anestrus	2 (4%)	—	—	2 (4%)
WEI[x] ≤ 7 d	42 (89%)	43 (91%)	39 (91%)	35 (78%)
WEI > 8 d	3 (6%)	4 (9%)	4 (9%)	8 (18%)
Non conception	3 (6%)	7 (15%)	5 (12%)	5 (11%)
Farrowing rate	42/45 (93%)	40/47 (85%)	38/43 (88%)	38/43 (88%)
Proportion of sows with 2nd litter	42/47 (89%)	40/47 (85%)	38/43 (88%)	38/45 (84%)
Litter size at 2nd parity (± SD)	10.86 (3.71)	10.69 (3.34)	10.48 (3.06)	10.97 (3.09)

[z]No significant wet feeding or meal frequency effects found.
[y]One sow was excluded from that group at weaning following a fracture of the hind leg.
[x]WEI, weaning-to-estrus interval.

Wet-fed sows ate 5.0% more feed during the lactation period than dry-fed sows; the greatest difference was observed for the first 2 wk of lactation, with 6.1% and 5.5% more feed consumed for the first and second week, respectively. For the total lactation period, this corresponded to a daily difference of 4.0 MJ ME, 43.3 g protein, and 2.6 g lysine. The difference in feed intake was lower than that observed by O'Grady and Lynch (1978) and Danielsen and Nielsen (1984) who reported a 12% increase in feed consumption for wet-fed sows compared with dry-fed sows. However, their studies were not exclusively done with primiparous sows. It is possible that the influence of wet feeding is greater in adult sows since their maintenance requirements are higher, and perhaps, they have a greater gut capacity. Although the ITP (1991) recommends 3 L of water per kg of feed, 1.5 L was used in our study because of the limited capacity of the trough. However, since water refusals were noted at almost every meal, the amount was probably sufficient.

The average weight loss, 2.6–5.3 kg, for all groups of sows in our study was minimal. However, weight change varied considerably among sows, ranging from -32.8 to +18.6 kg. The average weight loss observed was lower than the 6.1–20 kg loss reported in the literature for first-parity sows (Mullan and Close 1989; Stahly et al. 1990; Young et al. 1990). Pettigrew (1992) reported that nutrient requirements for growth and milk production are rarely met during the lactation period. A weight loss of 5 kg during this period seems acceptable and can be compensated for during the subsequent gestation (Etienne et al. 1989).

The ad libitum feeding within 12–16 h after parturition may have helped reduce the utilization of body reserves, as shown by the lack of weight and backfat losses in the first week in most groups of sows. Stahly et al. (1979), using a similar regime, reported that most of the weight and backfat losses occurred during the first week of lactation, even though the feed intake was high and similar to that of the subsequent 2 wk in their study. In our experiment, the greatest weight loss was noted during the last week of lactation, although feed intake was at its maximum. These results suggest that nutrient requirements could not be met even with 7.2 kg d^{-1} of feed, 98.6 MJ ME, 1080 g protein, and 64 g lysine. Stahly et al. (1990) noted that when lysine intake is increased from 20 to 47 g per day, weight loss was decreased from 20 to 4.4 kg. Backfat loss was also minimal in our study compared to that reported in the literature, less than 1.5 vs. 2–8 mm (Reese et al. 1984; Mullan and Close 1989; Baidoo et al. 1992).

Although feed intake was only influenced by wet feeding, an increased frequency of daily meals and the use of wet feeding reduced the mobilization of body reserves. Wet feeding reduced the weight loss, whereas the increased number of daily meals was associated with a lower backfat loss. The lower weight loss can only partly be attributable to a higher feed intake considering the magnitude of these differences. Surprisingly, sows fed thrice a day lost less backfat than those fed twice, even though feed intake was similar. The reason why a greater frequency of daily meals reduced the utilization of fat reserves is unclear. One hypothesis would be that a higher number of meals allowed a more even use of energy throughout the day. A relationship may exist between feeding frequency and certain blood metabolites and metabolic hormones, such as insulin and insulin-like growth hormone. More regular increased blood concentrations in these hormones may decrease the utilization of body reserves.

The feeding strategies evaluated did not improve sow and piglet performances. The lack of differences could be related to the high feed intake observed in all groups. King and Dunkin (1986a,b) reported that 50 MJ DE and 700 g of pro-

tein are required daily to minimize the weaning-to-estrus interval and optimize milk production. Lysine intake should be at 40 g d^{-1} to increase milk production and decrease mobilization of muscular reserves (Etienne et al. 1989; Stahly et al. 1990). To meet these requirements, sows should have eaten an average of 4.5 kg d^{-1} of the lactation diet used in our study; less than 3% of all sows did not consume the suggested level of nutrients for optimal performance.

Furthermore, the average weight and backfat losses were not severe in any group. It is reported that sows may lose up to 5 kg without any deleterious effects on subsequent reproductive performance (Etienne et al. 1989). Williams and Mullan (1989) also reviewed several studies on the effect of nutrition on reproductive performances. They concluded that the interval from weaning to oestrus was minimal when sows were weaned after a 3-wk lactation and at a liveweight of 150 kg or more. Most sows also completed their lactation with at least 20 mm of backfat, which might be adequate to sustain optimal reproductive performance, as suggested by the work of Whittemore and Morgan (1990) who reported that sows with 20–24 mm of backfat had a weaning-to-estrus interval of 5 d, whereas those with more or less than these values had a longer interval.

The experiment was also conducted in well controlled environmental conditions and during the spring, when feed consumption and reproductive performance are not generally considered to be problematic. The health status of the herd and the genetic potential of the animals may also have contributed to the growth performances of piglets, which averaged 238 g d^{-1}. Although our results on the effects of these regimes on sow performances failed to show a benefit, we believe that some of the feeding strategies evaluated in this controlled study could be useful during periods in which sows eat less, such as in the summer, or in some herds that have feed consumption problems. Moreover, a significant difference in mobilization of body reserves was noted between the treatments, even though the feed intake observed was already high for primiparous sows. Whether these feeding regimes would have a more pronounced effect on thin sows or different genotypes needs further investigation.

CONCLUSION

Feed intake during the lactation period was only influenced by wet feeding. Both an increased frequency of daily meals and the use of wet feeding led to reduced mobilization of body reserves. Wet feeding reduced the weight loss, whereas the increased number of daily meals was associated with a lower backfat loss. However, the feeding strategies evaluated did not significantly improve sow and piglet performances possibly because, feed intake was considered high for all treatment groups, and weight and backfat losses were not severe in any group.

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