

Sow and Piglet Performance during Lactation and Sow Rebreeding Performance for SowMax Self Feeders and Hand Feeding – Final Report

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The main purpose of this project is collect lactation and rebreeding data from sows that are either fed by hand or by SowMAX self-feeders. A secondary objective is to estimate differences in the amount of labor required to manage sows using each type of feeding system, especially during lactation. One-half of the farrowing crates in two farrowing rooms were retrofitted with SowMAX feeders. Farrowing occurs every other week at the Swine Educational Unit (n=24 sows per group) so at the present time we have been able to collect data on 36 sows in crates with SowMax feeders and 34 sows that are being fed by hand. At the time of this report, none of the sow that were fed during lactation with SowMax and were subsequently rebred have farrowed a second litter.

There were significant interactions between season (Winter versus Summer) and feeding Strategy (SowMax versus Hand-Feeding) for sow and piglet performance and sow daily feed intake patterns. Consequently, these data are presented within each season. Sow and piglet performance during lactation are shown in Tables 1 and 2 while sow daily feed intake patterns are shown in Figures 1 and 2. Tables 3 and 4 contain sow rebreeding performance and baby piglet death losses, respectively. There were no significant interactions between season and feeding strategy for these data so the means in these tables were averaged across seasons.

The data in all the Tables are the mean values and the standard errors. The last column in each table is the p value which is a measure of how different the means are statistically. In a general sense, the p value can be thought of in the following manner. If the experiment was repeated 1000 times, then one would expect same result as indicated by the p value due to chance. For example, in Table 1 the p-value for total feed intake is 0.043. Sows fed with the SowMax feeders consumed 17.2 lbs more feed during lactation compared with those fed by hand. What this means is that there is a less than 5% chance that this difference is simply due to chance and random events and a 95% chance that it is due to the SowMax feeder. Conversely, the body weight of sows after farrowing has a p value of 0.671. What this means is that there is more than a 50% chance that the differences observed are, in fact, due to chance or random events and not related to the way they were fed (SowMax versus Hand Feeding). The **p values in bold** are those that are less than 0.05 which is considered to be highly significant in the scientific literature. In other words, there is a 95% probability that the current difference is due to the feeding system. The *p values in bold italics* are ones with p values between 0.05 and 0.20. These are considered important trends in scientific literature. Usually what happens with trends is that as more data is collected (more observations) then their p values move closer to 0.05.

In general, total feed intake and daily feed intake appear to be superior for sows being fed with the SowMax feeders. This was particularly true during the summer months. Daily sow feed intake was consistently greater during the summer with the SowMax feeders after the first week of lactation compared with Hand Feeding. This was also true during the winter months was

mainly due to a more consistent feed intake pattern over the entire lactation with less variation from day to day. This was the main reason for the interaction between the feeder type and season. During the summer sows had a similar pattern of daily feed intake with both feeding systems. However, sows in crates with SowMax feeder simply ate more. In contrast, during the winter, the increase in feed intake for the SowMax feeder sows was due mainly to the lack of several transient periods of decreased feed intake which were prevalent when sows were had fed. There was also definitely less feed wastage on a dry matter basis with the SowMax feeders and, at least in our system, they required less labor and maintenance (cleaning) by workers that are feeding the sows, especially during the summer months when sow water consumption is high.

The increased feed intake during lactation resulted in better pre-weaning weight gain by the piglets. There were no differences in piglet mortality or rebreeding performance between treatments. A rather interesting observation was the lower body temperature during the last week in lactation of the sows on the SowMax feeders. This was even more pronounced during the summer months and most likely is responsible for the increased daily feed intake in these sows. This is most likely due to them being able to regulate their feed intake during the day. It has been shown that after consumption of a single large meal the core body temperature increases compared with intake of the same amount that is distributed evenly over a longer period of time. It appears the sows actually do regulate their feed intake, at least in part, based on the temperature of the ambient environment so having feed available constantly appears to be especially beneficial during the summer months.

Table 1. Sow and Piglet Performance during Lactation during the Winter months. Response variables based on 36 litters (sows) for SowMax feeding and 34 litters (sows) for Hand Feeding.

Response Variables	Treatments		P value
	SowMax Self Feeding	Hand Feeding	
Body weight after farrowing (lbs)	413 ± 10	403 ± 11	0.862
Body weight at weaning (lbs)	374 ± 12	352 ± 14	0.251
Weight loss during lactation (lbs)	39 ± 6	51 ± 7	0.211
Daily feed intake (lbs)	14.1 ± 0.3	13.3 ± 0.3	0.071
Total lactation feed intake (lbs)	296.3 ± 5.4	279.1 ± 4.7	0.043
Peak lactation feed intake (lbs)	17.8 ± 1.3	16.4 ± 1.7	0.179
Daily feed wastage – as fed (lbs)	2.3 ± 0.9	3.8 ± 1.0	0.326
Daily feed wastage – dry matter (lbs)	1.8 ± 0.3	3.3 ± 0.4	0.003
Rectal Temperature – day 17 (oF)	100.7 ± 0.1	101.2 ± 0.1	0.028
Number of pigs born alive	11.0 ± 0.3	10.9 ± 0.3	0.745
Number of mummies per litter (%)	1.5 ± 0.2	1.3 ± 0.3	0.673
Number of stillborns per litter (%)	6.1 ± 0.3	6.3 ± 0.4	0.816
Number of pigs weaned	9.9 ± 0.3	9.6 ± 0.3	0.442
Pre-weaning mortality (%)	10.0 ± 0.8	12.0 ± 1.2	0.113
Piglet birth weight – day 1 (lbs)	2.8 ± 0.3	3.0 ± 0.3	0.784
Piglet weaning weight – day 20 (lbs)	19.5 ± 1.0	17.8 ± 1.1	0.178
Piglet weight gain (lbs)	16.7 ± 0.7	14.8 ± 0.6	0.048
Labor daily feeding – 6 sows (min)	3.6 ± 0.8	6.5 ± 1.3	0.043
Labor daily cleaning feeders (min)	4.3 ± 1.3	7.4 ± 1.5	0.056

Table 2. Sow and Piglet Performance during Lactation during the Summer months. Response variables based on 38 litters (sows) for SowMax feeding and 37 litters (sows) for Hand Feeding.

Response Variables	Treatments		P value
	SowMax Self Feeding	Hand Feeding	
Body weight after farrowing (lbs)	425 ± 12	412 ± 11	0.671
Body weight at weaning (lbs)	389 ± 15	372 ± 14	0.325
Weight loss during lactation (lbs)	36 ± 3	40 ± 3	0.213
Daily feed intake (lbs)	12.1 ± 0.3	10.3 ± 0.3	0.011
Total lactation feed intake (lbs)	241.9 ± 4.8	212.1 ± 6.1	0.013
Peak lactation feed intake (lbs)	14.8 ± 1.0	12.3 ± 1.0	0.050
Daily feed wastage – as fed (lbs)	4.4 ± 0.9	6.8 ± 1.0	0.193
Daily feed wastage – dry matter (lbs)	2.8 ± 0.3	4.7 ± 0.3	0.002
Rectal Temperature – day 17 (oF)	101.2 ± 0.1	102.3 ± 0.1	0.001
Number of pigs born alive	11.0 ± 0.3	10.9 ± 0.3	0.814
Number of mummies per litter (%)	1.8 ± 0.2	1.9 ± 0.3	0.735
Number of stillborns per litter (%)	7.1 ± 0.3	7.3 ± 0.4	0.672
Number of pigs weaned	9.7 ± 0.3	9.6 ± 0.3	0.543
Pre-weaning mortality (%)	11.8 ± 0.6	11.9 ± 0.9	0.769
Piglet birth weight – day 1 (lbs)	2.9 ± 0.3	2.7 ± 0.3	0.438
Piglet weaning weight – day 20 (lbs)	17.9 ± 0.7	16.8 ± 0.8	0.163
Piglet weight gain (lbs)	15.0 ± 0.7	14.1 ± 0.6	0.123
Labor daily feeding – 6 sows (min)	4.8 ± 1.1	7.5 ± 1.1	0.041
Labor daily cleaning feeders (min)	6.3 ± 1.0	9.4 ± 1.4	0.031

Table 3. Sow Performance during Rebreeding and the first 14 days of Gestation. Response variables based on 68 sows for SowMax Feeding and 66 sows for Hand Feeding.

Response Variables	Treatments		P value
	SowMax Self Feeding	Hand Feeding	
Weaning-to-estrus interval (days)	4.8 ± 0.2	5.2 ± 0.2	0.563
Weight at weaning (lbs)	381 ± 15	365 ± 14	0.214
Weight into gestation (lbs)	401 ± 12	381 ± 15	0.265
Weight change – 14 days (lbs)	20 ± 5	16 ± 2	0.231
Body Condition Score at weaning	2.7 ± 0.2	2.6 ± 0.2	0.987
Body Condition Score into gestation	2.7 ± 0.2	2.6 ± 0.2	0.815
Change in Body Condition Score	0	0	----
Daily feed intake - rebreeding (lbs)	5.9 ± 1.1	4.8 ± 1.0	0.432
Labor daily feeding – 6 sows (min)	1.8 ± 0.3	3.4 ± 0.4	0.007

Table 4. Causes of Baby Pig Deaths for Sows fed with SowMax and by hand during lactation.

Response Variables	Treatments		P value
	SowMax Self Feeding	Hand Feeding	
Total Piglet Deaths	89	93	----
Crushing (%)	43.5	44.2	0.897
Starve-outs (%)	37.5	35.6	0.745
Low viability (%)	14.0	13.4	0.634
Diarrhea (%)	4.8	5.6	0.723
Ruptures (%)	1.2	1.2	0.738
Savaging (%)	0	0	----

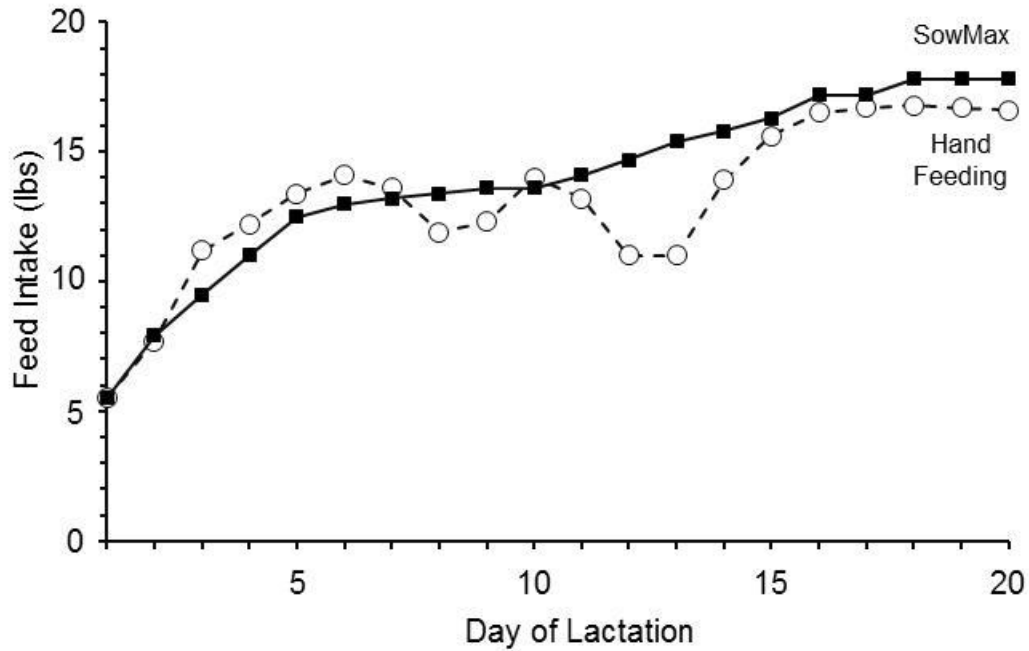


Figure 1. Daily feed intake patterns during lactation for sows on SowMax self feeders and sows being fed twice daily by hand during the Winter months. SowMax feeders were filled at 0630 as needed. Hand feeding occurred at 0630 and 1430 daily.

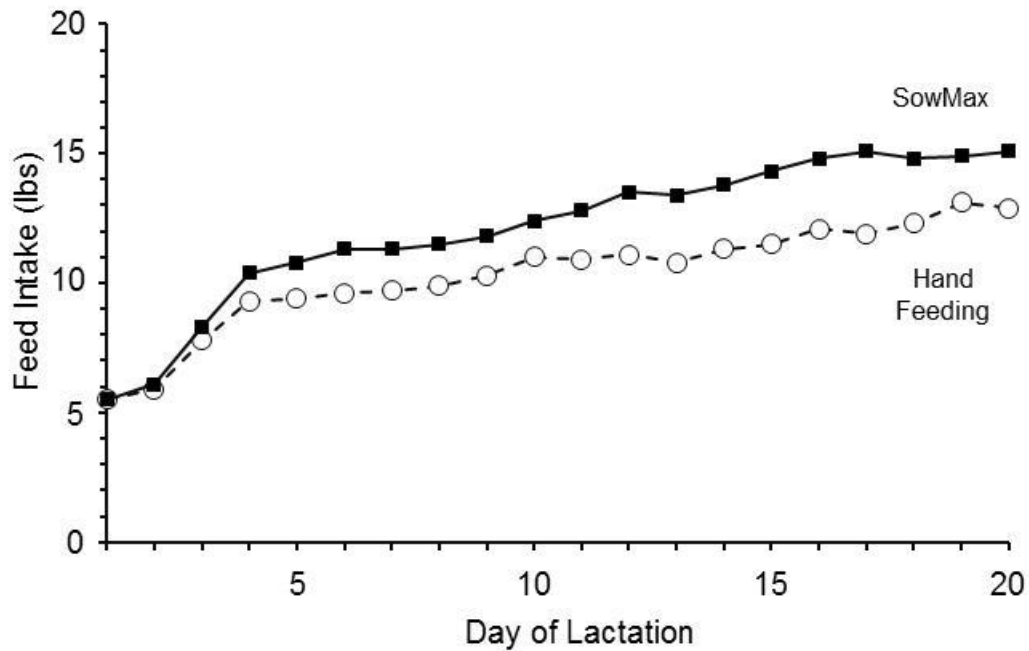


Figure 2. Daily feed intake patterns during lactation for sows on SowMax self feeders and sows being fed twice daily by hand during the Summer months. SowMax feeders were filled at 0630 as needed. Hand feeding occurred at 0630 and 1430 daily.