

# Influence of Sow Lactation Feeding System on Sow and Piglet Performance

L. Kelln, D.A. Columbus, and A.D. Beaulieu



Dan Columbus



Denise Beaulieu



## SUMMARY

Electronic feeding systems are available commercially for delivery of feed to sows during lactation. These feeding systems have multiple advantages over manual feed delivery including collection of feed intake data, delivery of fresh feed, and reduced feed wastage. However, electronic feeding systems are costly to install and maintain. The objective of this study was to determine the impact of a modified feeding system on sow and piglet performance during lactation. The feeding systems were manual feeding (meal-fed by hand), a commercially available electronic sow feeder (delivery of small meals at sow request), and a modified system. The modified system consisted of a feed drop tube that extends to just above the base of the feeder. The tube was kept full of feed and required the sow to manipulate the tube to release feed.

Results indicate sow body weight, body condition score, and back fat did not differ across treatments ( $P > 0.05$ ). Litter growth performance was reduced on the electronic feeder compared to manual fed sows in week 3 but did not result in any difference in overall litter weight. Sow feed intake was significantly higher with manual feeding compared to the electronic or modified feeding system in the first week post-farrowing but no difference was observed in week 3 ( $P > 0.05$ ). All three feeding systems evaluated resulted in similar performance of the sow and litter, however, both the electronic sow feeding system and the modified feeding system resulted in lower feed usage than manual feeding. Based on current average feed prices this reduced feed usage would result in approximately \$8.50 savings per lactation.

## INTRODUCTION

Feed is the single largest cost associated with producing pork, ranging from 50-70% of the total cost of production. When looking to save money in their feeding programs, producers typically consider the finishing herd as it represents approximately two-thirds of the total feed cost. One area that can be easily overlooked is lactation feeding strategies and delivery.

Traditionally most producers feed lactating sows manually, feeding sows up to three times per day in order to maximize feed intake and optimize litter performance. However, providing large quantities of feed may result in increased feed wastage or spoilage and may also result in an oversupply of feed to sows resulting in negative effects on subsequent reproductive performance. One technology pork producers have utilized to maximize lactation performance is electronic feeding systems for sows during lactation. These systems have multiple advantages over manual feed delivery including ensuring there is always fresh feed available, reduction in labour costs and keeping detailed records of feed intake which allows for management changes on an individual sow or whole-herd basis. However, these feed systems can be costly to install and maintain.

*“All three feeding systems resulted in similar sow and litter performance, however, the electronic and modified feeding system resulted in a significant reduction in feed wastage”*

A simple feeding system was developed which consisted of a feed drop tube extending to approximately one inch above the base of the feeder, and required the sow to manipulate the tube to release small quantities of feed.

## MATERIALS AND METHODS

A total of 45 sows (15 per treatment) were randomly assigned to 1 of 3 feed systems. The three feeding systems were: 1) manual meal feeding by hand, 2) electronic sow lactation feeder (Gestal, JYGA Technologies, Saint-Lambert-de-Lauzon, QC), and 3) a modified feeding system. The modified system consisted of a feed drop tube that extended to just above the bottom of the feeder. This tube was kept full of feed and required the sow to manipulate the tube in order to access feed. Sows were fed a standard lactation diet for the duration of the study.

Prior to being moved into the farrowing room (approximately 7 days prior to their expected farrowing date), sow body weight, backfat thickness and body condition score (5-point scale) were measured. Upon farrowing, total pigs born alive was recorded. Within 24-h of farrowing, piglets were cross-fostered to equalize the number of piglets per sow. Number of piglets born alive, number of piglets after cross-fostering and initial litter weight was recorded. Sow feed intake was monitored daily and any wasted feed (e.g., due to spoilage) was removed from the feeder and weighed. Litter weight was recorded weekly on days 7, 14, and 21 and any mortalities recorded. At weaning (21 days), sow body weight, backfat thickness, and body condition score were again recorded as well as days to first estrus.

In order to compare the three feeding systems, an economic analysis based on estimates of costs associated with installation of the different feed systems and on sow feed intake and average feed costs were performed using the Prairie Swine Centre Enterprise Model.

## RESULTS AND DISCUSSION

Initial sow body weight, backfat thickness, body condition score, and total number of piglets born alive were similar across all treatment groups. The feeding system had no impact on the final body weight, backfat thickness, or body condition score, which all decreased during lactation. Sow feed intake (feed disappearance) was significantly higher with manual feeding compared to either the electronic or modified feeding system in week one and two of lactation and over the entire lactation period (d 0 -21) with the greatest difference in feed intake observed during the first week post-farrowing. There was no effect of feeding system on sow feed intake (feed disappearance).

Litter average daily gain was higher with manual feeding compared to electronic feeding during the third week post-farrowing. However, there was no impact of feeding system on total litter weight overall. Final litter weight was similar across treatments and there was no treatment effect on piglet mortality or number of piglets weaned per litter.

All three feeding systems evaluated resulted in similar performance of the sow and litter. Both the electronic sow feeding system and the modified feeding system resulted in lower feed intake (feed disappearance) during the first two weeks of lactation. This is most likely the result of decreased feed wastage as there was no difference in sow or litter performance. These results also suggest that feed intake measures with manual feeding may not be accurate or indicative of actual sow feed intake given the amount of feed wastage that occurs with this system.

### Economic Analysis

Results from the project were analyzed using the Prairie Swine Centre Enterprise Model. On average the use of an electronic or modified feeding system reduced feed disappearance by 19.7%. This reduction was analyzed for an economic return to the producer. Results indicate producers who would adopt this technology would realize a net benefit of \$.85/market hog or \$.845/sow lactation, not including the cost and maintenance of the system implemented. Ease of adoption was also assessed and indicated that the modified sow feeding system was ranked "easy" to adopt while the

**Table 1: Sow characteristics and performance**

	Feeder			SEM	P-VALUE
	MANUAL (n=15)	ELECTRONIC (n=15)	MODIFIED (n=14)		
<b>Body weight (kg)</b>					
Initial	286.7	272.9	288.3	10.3	0.49
Final	263.7	241.3	257.3	10.8	0.31
Change	23.0	31.6	31.0	4.2	0.26
<b>Body condition score (1-5)</b>					
Initial	3.1	3.3	3.2	0.12	0.71
Final	2.7	2.7	2.8	0.14	0.80
Change	0.47	0.53	0.44	0.17	0.92
<b>Backfat (mm)</b>					
Initial	16.8	17.0	16.9	0.39	0.90
Final	15.4	14.7	15.5	0.57	0.54
Change	1.39	2.33	2.05	0.54	0.41
Liveborn	14.8	13.0	13.3	0.8	0.21
<b>Feed Disappearance (kg/d)</b>					
Week 1	5.13a	3.46b	2.68b	0.32	<0.001
Week 2	6.80a	5.55b	5.12b	0.35	<0.01
Week 3	5.95	5.36	5.87	0.32	0.41
Total	5.69a	4.80b	4.49b	0.29	0.01

electronic system would be rated "moderate". The adoption scale considers three main components: cost involved, labour involved and time required to implement change. Easy to adopt projects are those projects that could be adopted between 0-6 months and require a minimal amount of capital and labour components.

## CONCLUSION

All three feeding systems resulted in similar sow and litter performance, however, both the electronic and modified feeding system resulted in a significant reduction in feed wastage and, therefore, an estimated saving in feed costs of \$8.50 per lactation compared to manual feeding. The modified feeding system is a viable option for feed delivery to sows during lactation but does not provide the additional benefits of automated feed intake collection and individual sow feed intake assessment. Pork producers should base their choice of feeding system on their individual needs and the value that additional data would provide.

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