152 **Effects of daily and non-daily injection of recombinant porcine somatotropin (rpST) on performance and carcass characteristics of finishing pigs.** D. Zimmerman*, K. J. Prusa and N. D. Stewart, Iowa State University and Pitman-Moore.

The trial was designed to measure effects of amount and frequency of injection of recombinant porcine somatotropin (rpST) on performance and carcass characteristics of pigs. Treatments were injection of 0, 1 and 3 mg rpST daily, 2 and 6 mg rpST every other day and 6 mg rpST twice weekly. Treatments were initiated at 70 kg BW and were repeated in three blocks of pens. Each pen contained two gilts and two barrows. At 113 kg BW, one gilt and one barrow were randomly removed for slaughter. The remaining pigs were slaughtered at 131 kg BW. Pigs had continuous access to water and feed (16% crude protein; 1.0% lysine). Growth for the entire period and carcass composition averaged over the two slaughter weights are presented:

	Treatments, mg rpST*						CV, %
Item	0d	1d	3d	2od	6od	6tw	
ADG, kg	.869	.890	.900	.880	.962	.915	7.8
ADFI, kg	3.20[b]	2.92[c]	2.65[d]	2.89[cd]	2.96[bc]	3.13[bc]	5.8
Feed:gain	3.69[b]	3.29[c]	2.95[d]	3.30[c]	3.08[d]	3.42[c]	3.6
Dress, %	73.5	73.0	72.8	72.6	72.5	73.4	1.7
LMA, cm^2	35.1[b]	37.0[bc]	42.9[d]	35.7[b]	38.6[c]	37.1[bc]	11.3
BF, cm	2.87[b]	2.46[c]	1.62[e]	2.51[c]	2.06[d]	2.59[c]	17.9

*Abbreviations: d = daily; od = every other day; tw = twice weekly
[bcde]Means in a row without a common superscript differ, P < .05.

Rate of BW gain and dressing % were not affected (P > .05) by treatments. ADFI and backfat depth off center at 10th rib (BF) were minimized and feed:gain and loin muscle area (LMA) were maximized in pigs injected daily with 3 mg rpST. The responses to rpST were similar (P > .05) for pigs injected with 1 mg daily, 2 mg every other day and 6 mg twice per week. Therefore, injection of rpST every other day and twice weekly had less effect on feed efficiency and carcass characteristics than did daily injections.

Key Words: Somatotropin, Growth, Carcass Composition, Pig

153 **Feed intake pattern of group housed pigs monitored by a computerized feed intake system.** Y. Hyun*, M Ellis and F K McKeith, Department of Animal Sciences, University of Illinois, Urbana

The objective of this study was to determine the feed intake pattern of the three sexes of pig (entire male[E], barrows [B], and gilts [G]) using an electronic feed intake recording device(F.I.R.E, Hunday Electronics) This device records the feed intake of individual animals at each visit to the feeder. One hundred and twenty crossbred pigs were grown from 30kg for a 10 week period to a mean end weight of 81.5kg (s d. 9.2). They were housed in eight, mixed sex groups of 15 pigs, with 5 pigs of each sex in each group. Four dietary treatments were used with two pens being randomly allotted to each treatment The dietary treatments were comprised of differing protein levels. During the grower period (30 to 55 kg), diets ranging in crude protein content from 14 to 19% were used, and diets ranging in crude protein content from 13 to 17% were used for the remainder of the study Mean feed intake per visit (MFI), mean frequency of feeder visits per day (MFV), mean feeder occupation time per visit (MFO), feed intake per day (FID), feeder occupation time per day (FOD), and mean feed consumption rate (MFR) were calculated for each week of the study and body weights were recorded at the start and end of each week. Data were analyzed using the GLM procedure of SAS with the effects of diet, sex, diet x sex interaction, and body weight (fitted as a covariate) being included in the model. Data for MFI, MFV, MFO, FID, and FOD were transformed into a logarithmatic function and that for MFR were transformed to a square root function to obtain normal distributions Results are for sex means averaged across diets. B had longer FOD than E or G (65.7 v 61.9 v 62.6 min/day, sem 1.07 resp.; P<.05) which resulted from more frequent visits (12.1 v 11.1 v 11.6 visits/day, sem .20, for B, E, and G resp.; P<.01). B also had higher FID (1.53 v 1.46 v 1.46 kg/day, sem .0176, resp.; P<.05). No significant effect of sex was observed for MFI, MFO and MFR (P> 0.05). Visits to the feeder were greatest between 9.00 and 11.00 hrs. and lowest between 21.00 and 2.00 hrs There were positive correlations between MFI and MFO (.70), body weight and MFR (.65), and age and MFR (.61). Negative correlations between MFV and MFI (-.67), MFV and MFO (-.55), and MFR and MFO (-.51) were found However, correlations between growth rate and feed intake traits were generally low (<.30)

Key Words: feed intake, electronic feeding, feeding behavior, pigs

154 **Evaluation of modified potato starch in diets for the early-weaned pig.** C. A. Kerr*, R.D. Goodband, M. D. Tokach, J. L. Nelssen, B. T. Richert, and J. R. Bergstrom. Kansas State University, Manhattan.

Two growth trials were conducted to compare the effectiveness of replacing either corn or lactose with modified potato starches in diets for conventionally and early-weaned pigs. In Exp. 1, 198 pigs (initially 4.2 kg and 19 ± 2 d of age) were used to determine if modified potato starch (potato starch 1, enzymatically hydrolized to contain 1.5% glucose, 4.5% maltose, 8.5% maltotriose, and 85.5% sugars as higher glucose polymers) could replace a portion of the lactose in a high nutrient dense diet. Pigs were allotted by weight into each of six dietary treatments with either five or six pigs per pen and six replications per treatment. The control diet contained 10% dried whey (7.2% lactose), 7.5% spray-dried porcine plasma, 2.5% select menhaden fish meal, and 1.75% spray-dried blood meal. Additional treatments were formulated by adding 7 or 14% modified potato starch or lactose in place of corn. A positive control diet also was formulated containing 29% dried whey (providing the same amount of lactose as the 10% dried whey plus 14% lactose diet). All diets were formulated to contain 1.5% lysine and 17.88% soybean meal and were fed in a meal form. From day 0 to 14 postweaning, increasing dietary lactose tended to improve (linear, P < .11) ADG and ADFI. Added potato starch did not improve ADG but increased ADFI (linear, P < .05) compared with pigs fed the control diet. In Exp. 2, 180 pigs (3.9 kg and 15 ± 4 d of age) were used to evaluate the effects of two modified potato starches (potato starch 1 or potato starch 2, a further hydrolyzed potato starch with a greater percentage of sugars as either glucose or maltose) as a replacement for either corn or lactose in a segregated early-weaning diet (SEW). There were six pigs per pen and six replications per treatment. Pigs were fed a control diet containing 15% dried whey, 12% added lactose, 6% porcine plasma, and 6% select menhaden fish meal. Modified potato starch 1 or 2 (12%) replaced either corn or the added lactose on an equal weight basis. From d 0 to 7 postweaning, pigs fed modified potato starch 1 had greater (P < .10) ADG and ADFI than those fed modified potato starch 2. Pigs fed diets with either starch substituted for corn had greater ADG (P < .05) than those fed diets with either starch substituted for lactose. From d 0 to 14 and d 0 to 21, pigs fed diets containing either modified potato starch substituted for corn tended (P < .10) to have greater ADG than those fed the control diet. Pigs fed diets with either modified starch substituted for lactose had similar ADG to those fed the control diet. In conclusion, these results suggest that potato starch can improve growth performance of pigs when replacing corn and can replace a portion of the lactose in an SEW diet without adversely affecting performance.

Exp. 1	10%	Potato starch 1, %		Lactose, %		29%	
Item	Dried whey	7%	14%	7%	14%	Dried whey	CV
d 0 to 14							
ADG, g[ab]	290	299	304	304	322	349	13.2
G/F	.68	.65	.64	.67	.66	.69	10.8

[a]Linear effect of lactose (P < .11). [b]14% starch vs 29% dried whey (P < .05).

Exp. 2		Starch for corn		Starch for lactose		
Item	Control	Potato 1	Potato 2	Potato 1	Potato 2	CV
d 0 to 14						
ADG, g[a]	245	281	268	250	254	11.1
G/F[b]	.87	.85	.88	.77	.94	11.7

[a]Mean of pigs fed starch substituted for corn vs control (P < .10).
[b]Mean of pigs fed Potato starch 1 vs Potato starch 2 (P < .01).
Key Words: Pigs, Potato starch, Lactose.

155 **Influence of oat products on growth performance of weanling pigs.** M. M. Rantanen*, R. H. Hines, J. D. Hancock, M. R. Cabrera, and L. L. Burnham, Kansas State University, Manhattan.

Two 38-d growth assays were conducted to determine the value of oats and oat products as replacements for corn in diets for weanling pigs. In Exp. 1, 120 weanling pigs (avg initial BW of 5.6 kg) were used. Treatments were: 1) a corn-based control; 2) whole oats; 3) ground oat groats; and 4) oat flour. For d 0 to 10 postweaning, the diets had 1.55% lysine and at d 10, the pigs were switched to diets with 1.3% lysine. At d 24 postweaning, all pigs were changed to the same sorghum-based diet with 1.15% lysine. The diets were fed in pelleted form. For d 0 to 24, pigs fed whole oats consumed more feed and had lower G/F (P < .08) than pigs fed oat groats and oat flour. Pigs fed oat flour had greater ADG and G/F compare to those fed ground oat groats (P < .02). Overall (d 0 to 38), the same trends were noted, i.e., pigs fed whole oats tended to consume more feed and gain less efficiently than those fed oat groats and oat flour (P < .07), and pigs fed oat flour tended to have greater G/F (P < .08) compared to those fed oat groats. In Exp. 2, 180 weanling pigs (avg initial BW of 5.7 kg) were used. Treatments were: 1) a corn-based control; 2) whole oats; 3) roasted oats; 4) ground oat groats; 5) steam-flaked oat groats; and 6) oat flour. During d 0 to 24, pigs fed whole oats and roasted oats had lower ADG and G/F (P < .03) than pigs fed the oat groats treatments and oat flour, primarily because of the relatively poor performance for pigs fed roasted oats. Pigs fed whole oats had greater ADG (P < .01) compared to pigs fed roasted oats, and pigs fed steam-flaked oat groats had improved G/F (P < .001) compared to those fed ground oat groats. During the overall feeding period (d 0 to 38), pigs fed the dehulled oat products (oat groats, steam-flaked oat groats, and flour) tended to have greater G/F (P < .01) than pigs fed whole and roasted oats. Pigs fed whole oats had greater ADG and ADFI (P < .02 and .01, respectively) compared to those fed roasted oats, and steam-flaked oat groats tended to give improved G/F (P < .06) compared to ground oat groats. In conclusion, diets formulated with processed oat products, such as steam-flaked oat groats and oat flour, improved early growth performance of weanling pigs

Item	Corn	Whole	Groats	Flour	CV
d 0 to 24					
ADG, g	372	381	350	400	7.8
ADFI, g	504	522	468	472	9.1
G/F	.738	.730	.748	.847	5.1
d 0 to 38					
ADG, g	390	400	363	404	12.4
ADFI, g	627	658	586	604	9.7
G/F	.622	.608	.619	.669	6.1

Item	Corn	Whole	Roasted	Groats	Flaked	Flour	CV
d 0 to 24							
ADG, g	395	395	354	390	395	395	7.0
ADFI, g	486	495	440	486	449	463	8.6
G/F	.813	.798	.805	.802	.880	.853	4.6
d 0 to 38							
ADG, g	486	477	445	477	481	459	10.0
ADFI, g	708	713	663	704	681	667	8.2
G/F	.686	.669	.671	.678	.706	.688	5.0

KEY WORDS: Pigs, Growth, Oats, Carbohydrate