($P < 0.10$) to have greater G:F than pigs fed LL diets. For d 21 through 35 ($P < 0.09$) and 0 through 35 ($P < 0.04$), pigs fed LL diets had greater ADFI than pigs fed HL diets. Pigs fed enzyme had increased ADFI ($P < 0.05$) d 21 through 28 and tended ($P < 0.10$) to have improved ADG (984 vs. 937 g/d) from d 21 through 35. For all time periods, pigs fed the CWG diet had greater G:F ($P < 0.02$), during d 21 through 35 and 0 through 35 had greater ADG ($P < 0.04$), and for periods 7 through 21 ($P < 0.01$) and 0 through 35 ($P < 0.07$) had reduced ADFI compared to pigs fed the HL diet. Pigs harvested on d 7 fed enzyme diets had increased ($P < 0.02$) carcass yield and tended to have increased ($P < 0.06$) loin depth. Pigs fed LL diets had increased ($P < 0.05$) backfat (BF) depth compared to pigs fed HL diets on d 7. Pigs fed HL diets harvested on d 21 had reduced ($P < 0.01$) BF depth and increased ($P < 0.02$) percent lean versus pigs fed LL diets; pigs fed CWG had increased ($P < 0.02$) BF depth d 21 and d 35 and reduced ($P < 0.03$) percent lean d 21 compared to pigs fed the HL diet. Overall, pigs fed HL diets had reduced ($P < 0.03$) BF depth and increased ($P < 0.06$) percent lean when compared to pigs fed LL and CWG diets. In conclusion, pigs fed HL diets had reduced ADFI but improved G:F compared to pigs fed LL diets, which was further enhanced by addition of fat to treatment 3. Pigs fed mannanase numerically improved growth rate by 5% and G:F by 3% the last 2 wk of the study, with a greater response in the low lysine diets (ADG: 7.8%, d 21–35, 3.1% overall and G:F: 5.5%, d 21–35), which may warrant further study in ractopamine diets.

Key Words: lysine, mannanase, ractopamine

123 **Effects of corn particle size and diet form on finishing pig growth performance and carcass characteristics.** J. E. Nemechek[1,*], M. D. Tokach[1], K. F. Coble[1], C. W. Hastad[2], J. M. DeRouchey[1], S. S. Dritz[1], R. D. Goodband[1], *[1]Kansas State University, Manhattan, [2]New Fashion Pork, Jackson, MN.*

A total of 960 pigs (PIC TR4 × Fast Genetics York-AND × PIC Line 02; initially 34.3 kg BW) were used in a 101-d trial to determine the effect of corn particle size and diet form on finishing pig growth performance and carcass characteristics. There were 8 pens per treatment and 20 pigs per pen. Treatments were arranged in a 2 × 3 factorial with main effects of diet form and particle size. Diet forms were meal or pellet. Particle sizes were 650 µ, 350 µ, or an equal blend of the 650 µ and 350 µ ground corn. Diets were fed in 4 phases with the same corn–soybean meal–based diet containing 30% dried distillers grains with solubles (DDGS) (Phases 1 to 3) or 15% DDGS (Phase 4) used for all treatments. Overall (d 0 to 101), linear diet form × particle size interactions were observed ($P < 0.02$) for ADFI and G:F due to ADFI decreasing and G:F increasing as particle size was reduced for pigs fed meal diets but not for pigs fed pelleted diets. Pigs fed pelleted diets had increased ($P < 0.001$) ADG, G:F, and HCW compared with pigs fed meal diets. As corn particle size decreased, ADG and ADFI decreased (linear, $P < 0.02$). Carcass yield, backfat, and loin depth were not influenced ($P > 0.26$) by particle size or diet form. In summary, pigs fed pelleted diets had improved growth performance compared with those fed meal diets, with the greatest improvement in G:F observed when diets contained the coarsest ground (650 µ) corn. Feed efficiency improved as corn particle size decreased for pigs fed meal diets but not for those fed pelleted diets.

Key Words: particle size, pig, pellets

124 **In utero heat stress alters body composition during the early finishing phase (60 to 80 kg) in pigs.** J. S. Johnson[1,*], M. V. Sanz Fernandez[1], J. F. Patience[1], J. W. Ross[1], N. K. Gabler[1], M. C. Lucy[2], T. J. Safranski[2], R. P. Rhoads[3], L. H. Baumgard[1], *[1]Iowa State University, Ames, [2]University of Missouri, Columbia, [3]Virginia Tech, Blacksburg.*

The detrimental effects of heat stress (HS) on animal productivity have been well documented. However, whether gestational HS interacts with a future environmental insult to alter tissue deposition during the early finishing phase in pigs is unknown. Study objectives were to compare the subsequent rate and quantity of tissue accretion in finisher pigs exposed to differing in utero and postnatal thermal environments. Pregnant gilts were exposed to thermal neutral (TN; cyclical 15°C nighttime and 22°C daytime; $n = 9$) or HS (cyclical 27°C nighttime and 37°C daytime; $n = 11$) conditions during the entire gestation. Twenty-four offspring from gestational TN (GTN; $n = 6$ gilts and 6 barrows; 62.4 ± 0.7 kg BW) and gestational HS (GHS; $n = 6$ gilts and 6 barrows; 61.9 ± 0.8 kg BW) gilts were euthanized as part of an initial slaughter group (ISG). After the ISG, 48 pigs from GTN ($n = 12$ gilts and 12

Table 123.

Diet form:	Meal			Pellet			
Particle size:	650 µ	50% 650 µ + 50% 350 µ	350 µ	650 µ	50% 650 µ + 50% 350 µ	350 µ	SEM
ADG, kg	0.90	0.89	0.86	0.94	0.93	0.92	0.010
ADFI, kg	2.41	2.37	2.26	2.35	2.37	2.35	0.030
G:F	0.372	0.375	0.382	0.399	0.392	0.391	0.003
HCW, kg	88.6	89.5	87.7	93.1	92.3	90.4	0.915
Yield, %	74.1	74.3	74.6	74.5	74.4	74.3	0.402
Backfat, mm	15.7	15.8	15.8	16.4	15.7	16.4	0.411
Loin depth, mm	66.6	65.5	66.1	66.3	67.2	65.3	1.037
Lean, %	55.6	55.2	55.3	55.2	55.9	55.1	0.326