270P Effect of two ratios of supplemental β-mannanase to β-glucanase on grower pig growth performance. M. Gandarillas*[1,3], Z. Rambo[1], D. Kelly[1], J. Ferrel[2], and B. Richert[1], *[1]Purdue University, West Lafayette, IN, [2]ChemGen Corp., Gaithersburg, MD, [3]Pontificia Universidad Católica de Chile, Santiago, Chile.*

One hundred 36 crossbred pigs were used to determine the effect of 2 ratios of supplemental β 1,3 glucanase to β 1,4 mannanase (7:10 vs. 3:2) in corn-soybean meal diets with 25% corn dried distillers grains with solubles and supplemental phytase on pig growth performance during the grower (BW = 21 to 56 kg) period. Pigs were blocked by initial BW (20.8 ± 0.032 kg) and allocated in a randomized complete block design of mixed gender pens to 4 treatments. Treatments included: 1) negative control (NC) – no supplemental enzymes; 2) NC + 1000 phytase units/kg (PHY); 3) PHY + 0.08 MU/kg glucanase + 0.112 MU/kg mannanase (PHY+7:10); 4) PHY + 0.09 MU/kg glucanase + 0.058 MU/kg mannanase (PHY+3:2). All diets were formulated to meet (available P) or exceed (all other nutrients) NRC requirements of swine. There were 2 - 21 d phases with individual pig BW and pen feed disappearance recorded at d 0, 21, and 42 to calculate pen ADG, ADFI, and G:F. From d 0 to 21, pigs fed PHY and PHY+3:2 had 5.1% greater ADG ($P < 0.05$) and 6% greater G:F ($P < 0.05$) than NC. Additionally, PHY had greater ADG ($P < 0.05$) than PHY+7:10. There were no treatment differences in d 0–21 ADFI. No differences were observed in d 21–42 ADG among treatments. During d 21–42, PHY tended to have higher ADFI than PHY+7:10 ($P < 0.10$). Day 21–42 G:F was 6.6% greater with PHY+7:10 over NC and PHY ($P < 0.05$), with PHY+3:2 being intermediate. Overall, (d 0–42) PHY and PHY+3:2 tended to have greater ADG than NC ($P < 0.10$) with PHY+7:10 being intermediate (809, 842, 824, 841 g/d, respectively). Day 0–42 ADFI tended to be lower for PHY+7:10 compared with PHY ($P < 0.10$). Overall G:F was greater for PHY+7:10 over NC ($P < 0.05$) and PHY+3:2 tended to be greater than NC ($P < 0.10$), with PHY being intermediate (0.462, 0.473, 0.487, 0.480, respectively). Adding 1000 phytase units/kg plus 0.09 MU/kg glucanase and 0.058 MU/kg mannanase (3:2 ratio) improved ADG and final BW in grower pigs; however, feed efficiency was greater using an enzyme ratio of 7:10 in phytase supplemented diets.

Key Words: β-mannanase, β-glucanase, pig growth, phytase

271P Effects of XFE Liquid Energy and choice white grease on nursery pig performance. W. Ying*[1], J. M. DeRouchey[1], M. D. Tokach[1], S. S. Dritz[1], R. D. Goodband[1], J. L. Nelssen[1], W. E. Schiefelbein[2], and R. L. Odgaard[2], *[1]Kansas State University, Manhattan, [2]XFE Products, Des Moines, IA.*

Two experiments were conducted to evaluate the effects of XFE Liquid Energy (LE; XFE Products, Des Moines, IA) and choice white grease (CWG) on nursery pig growth. In Exp. 1, 150 nursery pigs (TR4 × 1050, 12.3 kg BW) were used in a 21-d trial. Pens were randomly allotted to 1 of 5 dietary treatments with 6 pens per treatment. Treatments included a corn-soybean meal-based control diet, the control diet with 2 or 4% CWG, and control diet with 2 or 4% LE. Overall (d 0 to 21), pigs fed LE had greater ($P < 0.04$) ADG and ADFI than control pigs. Pigs fed CWG had better (linear, $P < 0.05$) ADG and G:F than control pigs. Pigs fed CWG had better ($P < 0.02$) G:F compared with pigs fed LE. In Exp. 2, 228 nursery pigs (TR4 × 1050, 6.4 kg BW) were used in 30-d trial. Pens were randomly allotted to 1 of 6 dietary treatments with 7 pens per treatment. Pigs were fed in 2 phases, with phase 1 diets containing 4.5% fishmeal and 10% dried whey. The 6 dietary treatments were arranged in a 2 × 3 factorial with main effects CWG (0 or 4%) and LE (0, 2, or 4%). Overall (d 0 to 30), a CWG × LE interaction was observed for ADFI (quadratic, $P < 0.03$). Feeding LE in diets without CWG resulted in decreased ADFI; however, adding LE to diets containing CWG increased ADFI. Pigs fed CWG had lower ($P < 0.01$) ADFI and greater ($P < 0.01$) G:F than pigs fed no CWG. Feeding LE had no effects on ADG. Feeding CWG improved G:F in both experiments. The alcohol based LE product improved ADG without affecting G:F in Exp. 1. However, a similar response was not observed in Exp. 2.

Table 1. Effects of LE and CWG on growth performance

Exp.1			Control	2% CWG	4% CWG	2%LE	4%LE	SEM
d 0 to 21	ADG[abc], g		628	660	670	674	665	14
	ADFI[b], g		964	1000	958	1018	1012	20
	G:F[acd]		0.65	0.66	0.70	0.66	0.66	0.01
Exp.2		**0%LE, 0% CWG**	**2%LE, 0% CWG**	**4%LE, 0% CWG**	**0%LE, 4% CWG**	**2%LE, 4% CWG**	**4%LE, 4% CWG**	**SEM**
d 0 to 30	ADG, g	403	380	396	370	403	394	13
	ADFI[ef], g	631	591	622	550	588	565	17
	G:F[f]	0.64	0.64	0.64	0.67	0.69	0.70	0.01

[a]CWG vs. control, $P < 0.05$; [b]LE vs. control, $P < 0.05$; [c]CWG linear effect, $P < 0.05$; [d]CWG vs. LE, $P < 0.05$; [e]CWG×LE quadratic effect, $P < 0.05$; [f]CWG effect, $P < 0.01$.

Key Words: choice white grease, liquid energy, pig

272P Determination of digestible and metabolizable energy content of a corn-soybean co-extruded feedstuff for swine. K. Koch*, R. C. Bott, R. C. Thaler, and C. Hostetler, *South Dakota State University, Brookings.*

A metabolism trial was conducted to establish the digestible (DE) and metabolizable (ME) energy content of a corn-soybean co-extruded feedstuff for growing pigs. The test product is composed of 60% corn and 40% soybeans, which are then processed by extrusion. The experiment utilized 12 crossbred barrows, with an average initial body weight of 59.9 ± 1.4 kg, in a 2 period, crossover design. Barrows were housed individually in metabolism housing units. Dietary treatments included a basal diet (97.1% corn), and the test diet. The test diet was comprised of 70% basal diet and 30% corn-soybean co-extruded feedstuff on an as-fed basis. DE values for corn and soybeans, from the swine NRC, were used to calculate the basal and test diets to have 3630 kcal/kg and 3672 kcal/kg, respectively, on an as-fed basis. Barrows were blocked by treatment and split-rationed to include a morning and evening feeding. Daily rations were fed at 3 percent of individual body weight for a 9 d adjustment period, followed by a 4 d collection period. Throughout the collection period, total collections of feces and urine were performed during each morning feeding. Samples were pooled within barrow, frozen, and stored at 0°C until analysis of fecal and urinary energy was performed using isoperibol bomb calorimetry. Gross energy of dietary treatments was calculated using isoperibol bomb calorimetry. Digestible energy of treatments was determined by subtracting fecal energy from gross energy provided to barrows by each respective treatment. Metabolizable energy was determined by subtracting urinary energy from calculated digestible energy. On a dry-matter basis, the test diet contained 3908 kcal/kg DE and 3833 kcal/kg ME which was significantly greater than the