animal. Data was analyzed using Proc Mixed in SAS with pig as the experimental unit and pig (treatment) as the random effect according to a completely random design. There was no effect of treatment ($P > 0.05$) on relative abundance of genera. *Lactobacillus* appeared to be the dominant genus, and pigs were assigned to either high (≥ 50%) or low (≤ 50%) relative abundance categories. Within each treatment, 50% or more of the animals were classified within the high relative abundance group for *Lactobacillus*. Seventeen OTU (Operational Taxonomic Unit) comprised the *Lactobacillus* genus, and 2 OTU appeared to be dominant. These, *L. amylovorus* and *L. johnsonii,* contributed 33, 39.5, 43.9, and 40.3% of the CON, MESMB+SDP, MESBM+FM, and MESBM, respectively. Animals not characterized by low relative abundance for *Lactobacillus* were colonized by genera commonly associated with pathogenic bacteria, specifically *Terrisporobacter, Clostridium,* and *Streptococcus*. This evidence suggests that strategies to increase intestinal *Lactobacillus* populations may contribute to competitive exclusion of potential pathogenic bacteria. Production based diets that utilize MESBM as an alternative protein source can potentially induce beneficial microbial composition shifts in the ileum of weaned pigs.

Key Words: microbially enhanced soybean meal, weaned pigs, bacteria

331 Effects of Feeding Increasing Levels of HP 300 on Nursery Pig Performance. A. M. Jones*[,1], J. C. Woodworth[1], J. M. DeRouchey[1], G. E. Fitzner[2], M. D. Tokach[1], R. D. Goodband[1], S. S. Dritz[1], [1]*Kansas State University, Manhattan, KS,* [2]*Hamlet Protein, Findlay, OH*

Weaned pigs (n=1,215; 337 × 1050 PIC, Hendersonville, TN; initially 5.1kg) were used in a 43-d growth trial to determine the effects of feeding increasing levels of enzymatically treated soybean meal (HP 300) on nursery pig performance. Pigs were weaned at approximately 16 to 19 d of age, weighed and allotted by BW to 1 of 5 dietary treatments in a randomized complete block design and placed in pens with 27 pigs/pen and 9 pens/treatment. Diets were fed in two phases (d 0 to 7 and d 7 to 22), followed by a common phase 3 diet fed from d 22 to 43. Treatments included a control diet that was corn-SBM-based with 7.5% and 5.6% fish meal in phase 1 and 2, respectively; 3 diets formulated to contain increasing HP 300 (Hamlet Protein, Findlay, OH) ranging from 6.7 to 20% in phase 1, and 5 to 15% in phase 2 with equal increases in HP 300 and reductions in fish meal and soybean meal between treatments. A fifth treatment that had the same amount of SBM as the fish meal-control diet, but with HP 300 replacing fish meal on an equal SID Lys basis was included. From d 0 to 22 (treatment period), ADG, ADFI, and d 22 BW decreased (linear, P<0.05) as HP 300 increased. Overall (d 0 to 43), pigs fed increasing HP 300 from d 0 to 22 had a marginally significant reduction in ADFI (linear, P=0.071) and decreased final BW (linear, P=0.045). However, no differences were observed for growth performance among pigs fed the fish meal control diet and pigs fed the diet with HP 300 replacing only fish meal. In conclusion, increasing HP 300 in nursery pig diets resulted in poorer feed intake and final BW.

Key Words: fish meal, HP 300, nursery pig

332 Evaluating the Effects of Replacing Fish Meal with HP 300 on Nursery Pig Performance. A. M. Jones*, J. C. Woodworth, J. M. DeRouchey, M. D. Tokach, R. D. Goodband, S. S. Dritz, *Kansas State University, Manhattan, KS*

A total of 350 barrows (initial BW = 6.2 ± 0.01 kg) were used in a 21-d growth trial to determine the effects of replacing fish meal with enzymatically treated soybean meal (HP 300) on nursery pig

	Control	HP 300 Low	HP 300 Medium	HP 300 High	HP 300 replacing fish meal	SEM	HP 300 Linear, $P <$
BW d 22, kg	10.1	9.8	9.6	9.6	9.8	0.18	0.008
BW d 43, kg	21.0	20.6	20.4	20.3	20.5	0.29	0.045
d 0-22 ADG, g	219	202	200	199	207	6.7	0.020
ADFI, g	336	328	317	314	329	5.5	0.001
G:F	0.643	0.609	0.622	0.625	0.624	0.0126	0.406
d 0-43 ADG, g	361	353	348	349	351	6.4	0.120
ADFI, g	530	518	511	511	517	8.2	0.071
G:F	0.680	0.681	0.680	0.681	0.679	0.0034	0.963

Control vs. HP 300 replacing fish meal ($P > 0.10$).

	Negative	Fish meal	HP 300 replacing fish meal				
	control	control	SID Lys basis	kg for kg	15% HP 300	SEM	$P <$
d 0 to 21							
ADG, g	247^{yz}	278^{x}	253^{yz}	269^{xy}	245^{z}	10.2	0.080
ADFI, g	382^{ab}	407^{a}	354^{bc}	379^{abc}	352^{c}	11.1	0.003
G:F	0.649^{b}	0.687^{a}	0.713^{a}	0.709^{a}	0.693^{a}	0.0115	0.002
Final BW, kg	11.54^{b}	12.30^{a}	11.64^{b}	12.12^{ab}	11.48^{b}	0.238	0.042

^{a,b,c} Means within the same row with different superscripts differ (P<0.05).

^{x,y,z} Means within the same row with different superscripts differ (P<0.10).

performance. Pigs were weaned at 21-d of age, placed in nursery pens according to BW, and fed a common pelleted starter diet for 3-d, at which time pigs were weighed and pens allotted to 1 of 5 dietary treatments in a complete randomized block design with 5 pigs/pen and 14 pens/treatment. A composite sample of fish meal and HP 300 (Hamlet Protein, Findlay, OH) was collected and analyzed for AA content and proximate analysis to use in diet formulation. Diets were corn soybean-meal based with 10% spray-dried whey and formulated to contain 1.35% standardized ileal digestible (SID) Lys and balanced on an NE basis. The 5 treatments were: 1) a negative control (no specialty protein products); 2) diet with 6% fish meal; 3) diet with 9.1% HP 300 replacing fish meal on a SID Lys basis; 4) diet with 6% HP 300 replacing fish meal on a kg/kg basis; and 5) diet with 15% HP 300 included at the expense of SBM and fish meal. Overall (d 0-21), ADG (P<0.10) was marginally decreased and ADFI (P<0.05) decreased when pigs were fed 15% HP 300 compared with pigs fed the fish meal control. Pigs fed the negative control diet had the poorest G:F (P<0.05), with the other treatments not different from each other. Furthermore, pigs fed the fish meal control diet had increased (P<0.05) final BW compared to pigs fed the negative control, HP 300 replacing fish meal on a SID Lys basis, and 15% HP 300 diet. In conclusion, nursery pigs fed diets with fish meal had improved performance compared with those fed the control diet.

Key Words: nursery pig, HP 300, fish meal

333 Evaluating the Effects of Fish Solubles in Whole Fish Meal on Nursery Pig Performance. A. M. Jones*[,1], J. C. Woodworth[1], M. D. Tokach[1], S. Herbert[2], J. Smith[2], D. Berry[2], B. D. Goodband[1], J. M. DeRouchey[1], S. S. Dritz[1], *[1]Kansas State University, Manhattan, KS, [2]Daybrook Fisheries, New Orleans, LA*

A total of 700 barrows (Line 200 × 400, DNA, Columbus, NE; initially 6.5 kg) were used in a 21-d growth trial evaluating the effects of fish solubles in whole fish meal on nursery pig performance. Pigs were weaned at approximately 21-d of age, placed in nursery pens according to BW, and fed a common pelleted starter diet for 3-d, at which time pigs were weighed and pens were allotted to 1 of 5 dietary treatments in a randomized complete block design with 5 pigs/pen and 28 pens/treatment. Dietary treatments included a corn soybean meal-based control diet and 4 diets containing 6% fishmeal (LT Prime Menhaden Fishmeal Daybrook Fisheries Inc., New Orleans, LA). One batch of fish meal contained 0.87% fish solubles and the second batch contained 24.35% solubles. The 2 batches were then blended to provide dietary treatments with fish meal containing 0.87, 8.70, 16.52, and 24.35% fish solubles. A composite sample from each batch of fish meal was collected and analyzed for AA content and proximate analysis and used in diet formulation. Dietary treatments contained 10% spray-dried whey and formulated to contain 1.35% standardized ileal

		Fish Solubles, %					$P <$[1]
	Control	0.87	8.70	16.52	24.35	SEM	Control vs. Fish meal
d 0 to 21							
ADG, g	293	322	309	322	321	14.9	0.001
ADFI, g	412	442	431	447	449	13.9	0.001
G:F	0.711	0.729	0.717	0.722	0.716	0.0133	0.258
Final BW, kg	12.7	13.2	13.1	13.4	13.3	0.15	0.001

[1]Fish solubles%, not different (P>0.10) for all growth criteria.