

# Fermented soybean meal for newly weaned piglets



A.D. Beaulieu, Ph.D. A. G. van Kessel, Ph.D. and P. Leterme, Ph.D. and D. Gillis, B.Sc.

Soybean meal contains a variety of anti-nutritional factors which limit its inclusion into the diets of young piglets. It has been shown that fermentation of soybean meal (fSBM) effectively removes trypsin inhibitors, oligosaccharides and phytic acid and improves digestibility of nutrients, including amino acids.

These improvements however, are not consistently observed, and work is required which determines the variability among fSBM produced from different plants. Results from this project indicate pigs receiving approximately 17% HP5010 fSBM in their diets had reduced body weight relative to the pigs receiving a comparable amount of a commercial SBM product, Hamlet 300.

There is some evidence that suggests improvements in feed efficiency when fSBM replaced SBM in the diet of nursery pigs. However, in many of these experiments the fSBM is used as only a partial replacement of the SBM, being used as an additive to a typical post-weaning diet. For example, various projects have observed an improvement in feed efficiency when either 3.75 or 7.5% fSBM or 5% fSBM was included in diets of post-weaning piglets. Results suggest that fSBM may be a suitable replacement for antibiotics.

Other research has also indicated that while the inclusion of fSBM in the diet of post-weaning piglets is “better” (based on performance and health indicators) than a diet with a high inclusion of SBM, piglets still do better when receiving a diet with reduced levels of soy proteins. This suggests that optimization of the fermentation procedure is required. This project set out to determine if differences exist in palatability and nutrient content of fSBM from different sources and if these differences can be attributed to specific processing methods.

standard SBM and was formulated to contain 22% SBM in the finished diet. Individual fSBM's were substituted so that CP, NE and the lysine/NE ratio was comparable in all diets, and assumed the AA/CP ratio was constant in all the SBM ingredients.

## RESULTS

On day 14 and 21, pigs receiving approximately 17% HP5010 fSBM in their diets had reduced body weight relative to the pigs receiving a comparable amount of a commercial SBM product, Hamlet 300. Average daily gain was consistently

“Although only speculative some of these results may indicate reduced palatability with the fSBM product.”

This project examined five different fermented soybean meals (fSBM), standard 46% soybean meal (SBM), and two commercial products, Pepsogen and Hamlet protein. Piglets were fed diets in 3 phases, where phases were 3, 18 and 14 days for phase 1, 2, 3 respectively and diets were formulated to meet all requirements of pigs in each weight range. The control diet contained the

highest on the soybean meal diet (treatment 1), this achieved significance, relative to the HP5010 on days 10 to 14 ( $P < 0.05$ ). Differences in feed intake followed a similar pattern. A significant treatment effect was only observed during the 15 to 21 period when a difference between the soybean meal and HP5010 diet was observed. Piglets receiving the control diet had higher feed

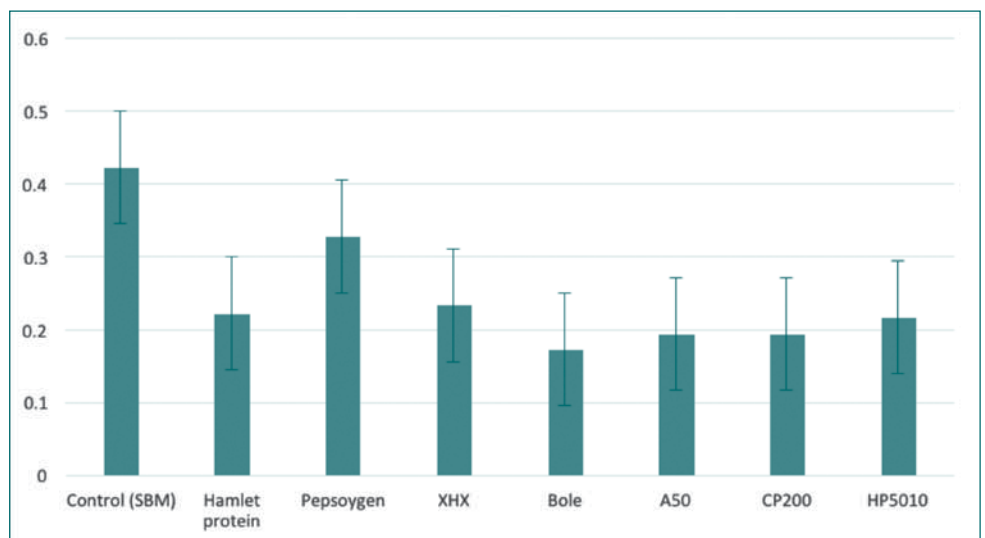
**Table 1. Performance of post-weaning piglets receiving diets containing diets with fSBM replacing a standard SBM**

	SBM control	Pep	Hamlet	Experimental fSBM				SEM	P-value	
				XHX	Bole	A50	CP200			HP5010
<b>Body weight, kg</b>										
d 0	6.37	6.45	6.45	6.38	6.39	6.42	6.5	6.46	0.05	0.39
d 3	6.15	6.2	6.27	6.25	6.07	6.11	6.23	6.13	0.07	0.27
d 9	6.56	6.64	6.79	6.69	6.51	6.53	6.64	6.51	0.10	0.33
d 14	7.70ab	7.54ab	8.17a	7.78ab	7.58ab	7.56ab	7.56ab	7.18b	0.21	0.07
d 21	10.20ab	9.75ab	10.60a	10.20ab	9.79ab	9.69ab	9.59ab	9.05b	0.29	0.02
d 28	13.40	13.10	13.60	13.40	12.70	12.80	12.40	12.10	0.43	0.12
d 35	17.90	18.00	18.30	18.20	17.30	17.20	17.30	16.50	0.61	0.42
<b>Average daily gain, g/d</b>										
d 0-3	-73.7	-82.8	-57.6	-42.8	-107.8	-104.1	-93.0	-111.8	19.30	0.098
d 4-21	232.2a	202.7ab	227.8a	218.1ab	203.3ab	192.3ab	186.0ab	168.1b	14.2	0.02
d 22-35	551.8	589.1	549.6	570.9	535.3	534.7	547.7	535.2	29.8	0.85
<b>Average daily feed intake, g/d</b>										
d 0-3	50.8	39.9	46.7	55.6	37.8	40.7	42.6	46.8	7.8	0.70
d 4-21	287.0	266.7	290.2	283.1	284.8	255.9	261.1	236.1	12.8	0.06
d 22-35	809.7	845.0	833.4	869.2	819.9	812.1	85.8	749.1	50.8	0.80
<b>Feed conversion</b>										
d 0-3	-2.46	-0.62	-1.91	-18.95	-5.31	51.6	4.69	-1.15	22.3	0.46
d 4-21	0.81a	0.76ab	0.78ab	0.77ab	0.71b	0.75ab	0.71b	0.71ab	0.02	0.02
d 22-35	0.69	0.70	0.67	0.66	0.66	0.68	0.70	0.74	0.03	0.41

intake relative to those receiving the HP5010 fSBM in their diet ( $P < 0.05$ ). Although only speculative, since as there were no significant treatment effects, some of these results may indicate reduced palatability with the fSBM product. The number of piglets with evidence of diet consumption during the initial 48 hours post-weaning was numerically increased on the soybean meal diet, relative to the fSBM supplemented diet.

**Conclusion**

There was no evidence in this experiment that fSBM was superior to a standard SBM in improving growth or feed intake of the newly weaned pig. Further work is required to determine if palatability of the fSBM's was a factor. 🐷



*Figure 2. The proportion of piglets (mean ± SEM) exhibiting evidence of feed intake in the initial 46 hours post-weaning. Effect of treatment,  $P = 0.29$ .*