



Performance responses of weaned pigs when fermented soybean meal (NF8) was replaced with a modified grain by-product (Gold Pro™)

FURST-McNESS COMPANY

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#203

ABSTRACT

The objective of this study was to determine in a commercial research environment if performance could be maintained when fermented soybean meal was replaced as a protein source with a modified, fermented corn by-product (Gold Pro™) at graded levels in the diet: 10% NF8 (NONE), 5% NF8 + 5% Gold Pro™ (PARTIAL) and 10% of Gold Pro™ (COMPLETE). The experiment involved 472 weaned pigs (21 days of age, 6.6 kg) that were allocated to either NONE, PARTIAL or COMPLETE replacement treatment diet, allocated by weight and weaning age, and blocked within the barn. A commercial wean-to-finish barn was used (29 pigs per pen, 4-6 pens per treatment) with a FANCOM feed system. To test the immediate post-weaning effect of the protein replacement, pigs were placed immediately onto treatments upon arrival. There was no adaptation period. Pens of pigs were weighed and feed disappearances were recorded on day 0, 7 and 21, which were used to calculate ADG, ADFI and FCR. To replicate commercial production as closely as possible, pigs that did not respond to treatment with injectable antibiotic were tagged and removed to sick pens. At the end of the trial it was determined if pigs that were removed from trial had died (% mortality) or remained as viable pigs (% morbidity). Medical treatments were recorded daily. Data was analyzed as a randomized complete block design using GLM procedure in Minitab with Tukey's test to determine differences between dietary treatments. There were no differences for (P>0.10) for days 0-21 ADG, ADFI or FCR. There were no differences (P>0.10) observed for % morbidity/pen. However, pigs fed the PARTIAL and COMPLETE feed had a lower % mortality/pen (P<0.01) in contrast with pigs fed the NONE treatment. There was a trend (P<0.10) for pigs fed the NONE treatment to have more medical treatments/pen compared to pigs fed the PARTIAL and COMPLETE treatments. In conclusion, Gold Pro™ can be used as an alternative protein ingredient to replace fermented soybean meal in weaned pig starter rations without loss of growth performance, and may have benefits on health.

BACKGROUND

The use of diets that are animal protein-free are becoming more common in use due to feed biosecurity concerns. However, many of the traditional animal proteins (spray dried plasma, red blood cells) provided large amounts of branched chain amino acids to starter diets. Most vegetarian protein sources are naturally low in valine, isoleucine, leucine and the vegetarian feeding ingredient Gold Pro™ is uniquely high in branched chain amino acids.

OBJECTIVES

The objective of this study was to determine in a commercial research environment if performance could be maintained when fermented soybean meal was replaced as a protein source with a modified, fermented corn by-product (Gold Pro™) at graded % levels in the diet.

DIETARY TREATMENTS

- NONE – 10% NF8
- PARTIAL – 5% NF8 + 5% Gold Pro™
- COMPLETE – 10% Gold Pro™



MATERIALS & METHODS

- 472 weaned, commercial nursery pigs (avg. 6.6 kg & 21 days of age)
- Blocked by environment & allocated by pen & weaning age
- Housed in a commercial wean-to-finish barn
- 21-day study
- 3 dietary treatments (4-6 reps/trt)
- FANCOM feeding system
- Diets met or exceeded 2012 NRC requirements

Performance

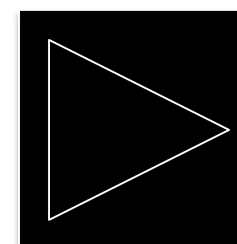
- Pens of pigs weighed on day 0, 7 and 21
- Feed disappearance measured
- ADG, ADFI and FCR calculated

Morbidity, Mortality, & Treatments

- Medical treatments recorded daily
- Pigs unresponsive to injectable treatments
 - Tagged & moved to sick pen
- Morbidity – tagged pigs that remained as viable pigs
- Mortality – pigs that died

Statistical Analysis

- RCBD
- Minitab
 - GLM procedure
 - Tukey's test to determine differences
- Experimental Unit = pen
- Means reported as Adjusted Means





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DIETS

Table 1: Composition of Phase 1 (6.3-9.1 kg)

INGREDIENT	NONE	PARTIAL	COMPLETE
Crumbled Nursery Concentrate	35.00	35.00	35.00
Corn	32.17	36.96	40.69
Soybean Meal	16.99	11.87	7.83
NF8	10.00	5.00	-
Gold Pro™	-	5.00	10.00
Nursery Premix	2.50	2.50	2.50
Choice White Grease	1.00	1.00	1.00
Monocalcium Phosphate	0.86	0.86	0.85
Limestone	0.75	0.86	0.99
CTC 50	0.40	0.40	0.40
Denagard 10	0.18	0.18	0.18
DL-Methionine	0.06	0.06	0.06
L-Lysine HCl	0.05	0.23	0.37
L-Threonine	0.04	0.08	0.11
L-Tryptophan	-	-	0.02
TOTAL	100.00	100.00	100.00

Table 2: Composition of Phase 2 (9.1-11.3 kg)

INGREDIENT	NONE	PARTIAL	COMPLETE
Corn	42.55	46.97	51.38
Soybean Meal	23.90	19.18	14.47
Crumbled Nursery Concentrate	17.50	17.50	17.50
NF8	10.00	5.00	-
Gold Pro™	-	5.00	10.00
Nursery Premix	2.50	2.50	2.50
Limestone	1.03	1.17	1.30
Choice White Grease	1.00	1.00	1.00
Monocalcium Phosphate	0.88	0.87	0.87
CTC 50	0.40	0.40	0.40
Denagard 10	0.18	0.18	0.18
DL-Methionine	0.05	0.05	0.05
L-Lysine HCl	0.03	0.19	0.35
L-Tryptophan	-	-	0.01
TOTAL	100.00	100.00	100.00

CONCLUSION

- Gold Pro™ is a stabilized corn-yeast fermentation product that has been shown in this trial to be an effective protein ingredient for newly-weaned pigs.
- Gold Pro™ was shown to be able to replace NF8 in this trial.
- Numerically, feed intake was improved with increasing levels of Gold Pro™ in the diet.

- Pigs fed increasing levels of Gold Pro™ were found to have lower mortality and treatments, suggesting that Gold Pro™ may support the health of the piglets.
- Gold Pro™ can be used in diets to provide branched amino acids at high levels without utilizing other more traditional sources of those amino acids (plasma, red blood cells).

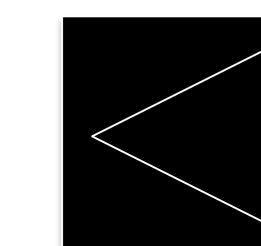
RESULTS

Table 3: Summary of Growth Performance and Health Status for d 0-21

	BW, kg				
	NONE	PARTIAL	COMPLETE	SE	P-value
d 0	6.6	6.5	6.6	0.14	0.391
d 7	7.3 ^a	7.3 ^a	7.5 ^b	0.14	0.050
d 21	12.9	12.7	13.0	0.35	0.608
Growth Performance					
	NONE	PARTIAL	COMPLETE	SE	P-value
ADG, g	303	296	303	19.3	0.829
ADFI, g	413	405	430	27.4	0.455
FCR	1.36	1.37	1.41	0.051	0.379
Health Status					
	NONE	PARTIAL	COMPLETE	SE	P-value
Morbidity/pen, %	0.69	0.99	0.25	1.836	0.936
Mortality/pen, %	3.80 ^a	1.20 ^b	0.00 ^b	1.048	0.005
Treats/pen	4.8 ^c	1.4 ^d	1.7 ^d	1.71	0.069

^{a,b}Means with different superscripts in the same row differ at P < 0.05.

^{c,d}Means with different superscripts in the same row differ at 0.05 < P > 0.10.



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Table 1. Summary of Performance Day 0 to 21

	NONE	PARTIAL	COMPLETE	SE	P-value
ADG, g	303	296	303	19.3	0.829
ADFI, g	413	405	430	27.4	0.455
FCR	1.36	1.37	1.41	0.051	0.379
% Morbidity/pen	0.69	0.99	0.25	1.836	0.936
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Key Words: Weaned Pigs, Protein, Ingredient,