

The ProVIA logo is a green rounded rectangle with the word "PROVIA" in white, uppercase letters. A small trademark symbol (TM) is located at the top right of the word.

PROVIA™

Results of a Collaborative Feeding Trial

**Confluence Genetics Ultra-High Protein,
Low Oligosaccharide Soybean Meal from
ProVIA™ Soybeans in Broiler Diets –
Performance Compared to
Conventional Soybean Meal**



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GENETICS

ABSTRACT

A 42-day broiler feeding trial was conducted in collaboration between Confluence Genetics, Inc. and a large poultry integrator. The study aimed to evaluate the impact of Confluence Genetics (CG) Ultra-High Protein, Low Oligosaccharide (UHP-LO) soybean meal (SBM) derived from ProVIA™ soybeans on broiler performance and carcass traits in isocaloric and isonitrogenous diets. Two dietary treatments were tested to assess the effects of UHP-LO SBM relative to conventional SBM. Results demonstrated that replacing conventional SBM with Confluence Genetics UHP-LO SBM can improve broiler performance and potentially lower the cost of production, as birds fed UHP-LO SBM demonstrated significantly higher final body weight and improved feed conversion ratio. These findings confirm the enhanced nutritional benefits of the increased metabolizable energy and crude protein content of CG UHP-LO SBM in broiler diet formulations, suggesting the potential for increased economic returns for poultry producers when using this product.

INTRODUCTION

Animal nutrition aims to minimize feed costs while maximizing animal performance. As a key protein source, soybean meal (SBM) plays a crucial role in broiler diet formulation. Efficient use of SBM is essential, given that feed represents the largest expense in broiler production. UHP-LO SBM offers enhanced amino acid content and reduced anti-nutritional factors compared to conventional SBM, with 14% higher crude protein content and a >90% reduction in the oligosaccharides raffinose and stachyose. Due to a combination of these factors, as well as increased sucrose levels, UHP-LO SBM offers higher levels of metabolizable energy compared to conventional SBM.

Confluence Genetics (CG) Ultra-High Protein, Low Oligosaccharide (UHP-LO) SBM has shown potential to improve broiler performance and costs in previous trials, but additional trials with end-user partners will continue to guide commercial formulation. In the first trial conducted with the large poultry integrator that sponsored this study – referred to as integrator two or trial two in previous reports – it was observed that broilers fed with UHP-LO SBM showed significant gains over conventional SBM, including a 5.1% improvement in final body weight, a 3.2% improvement in feed conversion ratio, and a 0.8% improvement in carcass yield. To validate these results, a large-scale 42-day pen trial was conducted in association with the same large poultry integrator to assess whether feeding UHP-LO SBM as a complete replacement for conventional SBM could deliver feed cost savings while improving broiler performance.

The positive outcomes of this study, which replicated the results of the first trial, demonstrates the consistent performance-enhancing benefits of UHP-LO SBM and presents an opportunity for broiler producers to optimize their feed formulations.

OBJECTIVE OF THE TRIAL

Evaluate Confluence Genetics Ultra-High Protein, Low Oligosaccharide (UHP-LO) soybean meal (SBM) as a complete replacement of conventional SBM to reduce diet costs while improving broiler performance.

METHODS

The trial involved 3,840 YP x 708 straight run broilers. A four-phase feeding program based on corn and soybean meal (SBM) was used, with diet changes taking place at approximately 11, 22, and 36 days of age. Isocaloric and isonitrogenous diets were fed as crumbles for the first 10 days, followed by pellets through the conclusion of the trial. UHP-LO SBM is recommended to be formulated with an energy level of at least 80 kcal per pound higher than the conventional SBM, based on evidence of increased energy digestibility due to its higher protein content, lower antinutritional factor content and higher sucrose levels (Perryman and Dozier, 2012; Parsons et al, in preparation). Treatments were as follows: Conventional SBM; UHP-LO SBM formulated with a metabolizable energy level of +80 kcal per pound over the control SBM. For the UHP-LO SBM dietary treatment, 100% of the SBM source in the diet came from UHP-LO SBM (Table 1). Recommended nutritional specifications for UHP-LO SBM can be found in Table 2. Each dietary treatment was assigned to 16 pens, with 60 birds per pen. Mortality and mortality weights were recorded daily. Feed consumption and body weights were measured by pen to calculate feed efficiency. At the conclusion of the trial, all birds were tagged and processed; carcass traits were measured for 4 birds per pen (2 males and 2 females) per dietary treatment. Data was analyzed to rule out any significant block or pen effects. Outliers were detected using the standard interquartile range method and removed. Response variables were analyzed using a general linear mixed model to evaluate the effect of diet. Significance was determined at a p-value of less than 0.05.

TABLE 1: TRIAL TREATMENT DIETS BY FEED PHASES

Feed Phase	Ingredient (lbs)	Conventional SBM	CC UHP-LO SBM
Phase 1	Corn	1165.9	1233.1
	Conventional SBM	728.2	0.0
	UHP-LO SBM	0.0	619.3
	Animal Fat	26.5	5.0
	Soy Hulls	0.0	62.4
	Other Ingredients	79.4	80.2
Phase 2	Corn	1278.5	1343.6
	Conventional SBM	621.5	0.0
	UHP-LO SBM	0.0	528.6
	Animal Fat	25.6	5.0
	Soy Hulls	0.0	47.6
	Other Ingredients	74.4	75.2
Phase 3	Corn	1376.5	1450.9
	Conventional SBM	528.9	0.0
	UHP-LO SBM	0.0	449.8
	Animal Fat	27.9	5.0
	Soy Hulls	0.0	26.8
	Other Ingredients	66.7	67.5
Phase 4	Corn	1415.4	1505.3
	Conventional SBM	494.7	0.0
	UHP-LO SBM	0.0	420.9
	Animal Fat	32.2	5.0
	Soy Hulls	0.0	10.5
	Other Ingredients	57.7	58.3

TABLE 2: NUTRIENT SPECIFICATION FOR CONFLUENCE GENETICS UHP-LO SOYBEAN MEAL

All amino acid values shown are total amino acids. Equivalent amino acid digestibility to conventional soybean meal was assumed for formulation.

Nutrient	Unit	CG UHP-LO Soybean Meal
Moisture	%	9.64
Crude Protein	%	53.45
Metabolizable Energy Poultry	Kcal/lb	80 kcals higher than control soy
Crude Fat	%	0.48
Crude Fiber	%	2.64
Ash	%	6.46
Calcium	%	0.26
Phosphorus - Available	%	0.27
Phosphorus - Total	%	0.65
Lysine	%	3.48
Methionine	%	0.74
Methionine + Cystine	%	1.52
Arginine	%	3.98
Tryptophan	%	0.67
Valine	%	2.67
Glycine	%	2.26
Histidine	%	1.45
Phenylalanine	%	2.82
Threonine	%	2.06
Leucine	%	4.15
Isoleucine	%	2.59
Choline	mg/pound	1250.00
Sodium	%	0.03
Potassium	%	2.07
Sulfur	%	0.43
Dry Matter	%	90.36

Nutrient composition was measured by the University of Missouri-Columbia, College of Agriculture, Food and Natural Resources Agricultural Experiment Station Chemical Laboratories.

RESULTS AND DISCUSSION

Weights, feed conversion ratios (FCR), and livability results are shown in Table 3. The UHP-LO SBM treatment was shown to have significantly increased final body weights and significantly improved mortality-adjusted FCR compared to the conventional SBM treatment. Bird livability was not significantly affected by diet. Carcass yield traits are summarized in Table 4. No significant differences were observed in white meat yield among treatments measured as a percentage of live weight or in pounds. Overall, these findings validate the advantages of incorporating UHP-LO SBM as a high-protein, energy-dense ingredient in broiler diet formulations. A comparison between the results of the first trial conducted with this large poultry integrator and these study findings are presented in Table 5. Consistent results were reported across the two studies, including increased final body weight and improved feed conversion ratio.

TABLE 3: FINAL WEIGHT, FEED CONVERSION RATIO, FEED CONVERSION ADJUSTED FOR MORTALITY AND LIVABILITY

	Final body weight adjusted by mortality (lbs)	Mortality adjusted FCR	Mortality and body weight adjusted FCR*	Livability (%)
Conventional SBM	5.49 a	1.517 a	1.515 a	96.79 a
CG UHP-LO	5.61 b	1.486 b	1.475 b	96.67 a

a,b Means in the same column that do not have a common superscript differ ($P > 0.05$)

*Feed conversion adjusted to the average bird size of the trial using a factor of 0.15 pounds equivalent to 0.01 points of feed conversion

TABLE 4: CARCASS YIELD

	White meat (lbs)	White meat (% of live weight)
Conventional SBM	1.44	26.19
CG UHP-LO	1.47	26.28

All differences among treatments were found non-significant ($P > 0.05$)

TABLE 5. RELATIVE FINAL WEIGHT AND FEED CONVERSION ADJUSTED FOR MORTALITY FOR TRIAL 1 AND TRIAL 2 WITH THE SAME LARGE POULTRY INTEGRATOR

CC UHP-LO Relative to Conventional SBM (percentage point difference)	Final body weight adjusted by mortality (lbs)	Mortality adjusted FCR
Trial 1	+ 5.1%	- 3.2%
Trial 2 (This Study)	+ 2.2%	- 2.6%

CONCLUSIONS

The findings from this study demonstrate the value of Confluence Genetics Ultra-High Protein, Low Oligosaccharide (UHP-LO) soybean bean meal (SBM) as a performance-enhancing ingredient in broiler diets. The higher crude protein, amino acid content, and energy density, as well as reduced levels of anti-nutritional factors, in UHP-LO SBM creates value through optimized feed formulations. The findings of this study validate previous trial results and suggest consistent performance benefits associated with UHP-LO SBM, including significantly higher final body weight and improved feed conversion ratio compared to conventional SBM. These results confirm that UHP-LO SBM can be used as a premium feed ingredient to drive both profitability and efficiency in the poultry industry.

REFERENCES

1. Perryman, K. R., & Dozier, W. A. III. (2012). Apparent metabolizable energy and apparent ileal amino acid digestibility of low and ultra-low oligosaccharide soybean meals fed to turkey chickens. Poultry Science, 91(11), 2556-2563. <https://doi.org/10.3382/ps.2012-02379>

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