

**POULTRY
INTEGRATOR**

Results of a Collaborative Feeding Trial

**Turkey Performance Through the Use of
Confluence Genetics Ultra-High Protein,
Low Oligosaccharide Soybean Meal in
Comparison to Conventional Soybean Meal**



confluence[™]
GENETICS

ABSTRACT

A 20-week turkey 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) on turkey performance and carcass traits in isocaloric and isonitrogenous turkey diets. Three 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 potentially improve turkey performance and lower the cost of production, as birds fed UHP-LO SBM demonstrated numerically higher final body weight, improved feed conversion ratio, and improved white meat yield. These findings confirm the enhanced nutritional benefits of the increased metabolizable energy and crude protein content of CG UHP-LO SBM in turkey 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 turkey diet formulation. Efficient use of SBM is essential, given that feed represents the largest expense in turkey production. Confluence Genetics (CG) Ultra-High Protein, Low Oligosaccharide (UHP-LO) SBM has shown potential to improve broiler performance and reduce broiler live costs in previous trials, but this product had not yet been tested in turkey production systems. 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. To prove out the nutritional benefits of UHP-LO SBM in turkey diets, a large-scale 20-week pen trial was conducted in association with a large turkey integrator to assess whether feeding UHP-LO SBM as a complete replacement for conventional SBM could deliver feed cost savings while maintaining, or improving, turkey performance and carcass characteristics. The positive outcomes of the study present a real opportunity for turkey nutritionists and the poultry industry by demonstrating the potential of UHP-LO SBM to improve the nutritional and economic efficiency of turkey diets while maintaining overall performance.

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 maintaining, or improving, turkey performance.

TABLE 1: TURKEY TRIAL TREATMENT DIETS BY FEED PHASES

Feed Phase	Ingredient (lbs)	Conventional SBM	CG UHP-LO SBM	CG UHP-LO no energy credit
Phase 1	Corn	652.5	831.2	814.0
	Conventional SBM	725.2	0.0	0.0
	UHP-LO SBM	0.0	591.6	587.6
	Animal Fat	127.9	83.8	104.2
	Meat & Bone Meal	200.0	200.0	200.0
	Other Ingredients	294.4	293.4	294.2
Phase 2	Corn	942.4	1102.5	1108.9
	Conventional SBM	654.2	0.0	0.0
	UHP-LO SBM	0.0	534.6	507.7
	Animal Fat	124.9	85.3	101.8
	Meat & Bone Meal	200.0	200.0	200.0
	Other Ingredients	78.5	77.6	81.6
Phase 3	Corn	1005.5	1140.1	1132.1
	Conventional SBM	578.5	0.0	0.0
	UHP-LO SBM	0.0	480.7	471.1
	Animal Fat	149.2	114.4	130.5
	Meat & Bone Meal	200.0	200.0	200.0
	Other Ingredients	66.8	64.8	66.3
Phase 4	Corn	1005.5	1140.1	1132.1
	Conventional SBM	578.5	0.0	0.0
	UHP-LO SBM	0.0	480.7	471.1
	Animal Fat	149.2	114.4	130.5
	Meat & Bone Meal	200.0	200.0	200.0
	Other Ingredients	66.8	64.8	66.3
Phase 5	Corn	1055.7	1196.6	1181.6
	Conventional SBM	506.3	0.0	0.0
	UHP-LO SBM	0.0	394.6	395.7
	Animal Fat	187.1	155.0	168.9
	Meat & Bone Meal	198.0	200.0	200.0
	Other Ingredients	52.9	53.8	53.8
Phase 6	Corn	1180.7	1289.9	1278.4
	Conventional SBM	389.1	0.0	0.0
	UHP-LO SBM	0.0	300.8	301.6
	Animal Fat	186.6	161.6	172.2
	Meat & Bone Meal	196.0	200.0	200.0
	Other Ingredients	47.6	47.7	47.8
Phase 7	Corn	1257.6	1349.1	1339.7
	Conventional SBM	318.9	0.0	0.0
	UHP-LO SBM	0.0	244.9	245.5
	Animal Fat	197.2	176.7	185.3
	Meat & Bone Meal	182.0	184.0	184.0
	Other Ingredients	44.3	45.3	45.5

METHODS

The trial involved 3,072 male Select Genetics turkeys. A seven-phase feeding program based on corn and soybean meal (SBM) was used, with diet changes taking place at approximately 0, 42, 65, 58, 99, 113, and 126 days of age. Isocaloric and isonitrogenous diets were fed as crumbles for the first 6 weeks, followed by pellets through the conclusion of the trial. Diets included an anticoccidial (Coban®, Elanco Animal Health) (Table 1). 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 as recommended, where the UHP-LO SBM is credited with a metabolizable energy level of +80 kcal per pound over the control SBM; and UHP-LO SBM formulated with no metabolizable energy credit. For each of the UHP-LO SBM dietary treatments, 100% of the SBM source in each diet comes from UHP-LO SBM (Table 1). Recommended nutritional specifications for UHP-LO SBM can be found in Table 2. The conventional SBM dietary treatment was assigned to 10 pens, and the two UHP-LO SBM dietary treatments were assigned to 11 pens each, with 96 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 10 birds per dietary treatment. Response variables were analyzed using a general linear mixed model to evaluate the effect of diet. Data was analyzed to rule out any significant block or pen effects. Significance was determined at a p-value of less than 0.05.

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

Equivalent amino acid digestibility to conventional soybean meal was assumed for formulation.

Nutrient	Unit	Soybean Meal CC UHP-LO
Moisture	%	12.00
Crude Protein	%	53.75
Metabolizable Energy Poultry	Kcal/lb	80 kcals higher than control soy
Crude Fat	%	0.68
Crude Fiber	%	2.66
Ash	%	6.27
Calcium	%	0.26
Phosphorus - Available	%	0.27
Phosphorus - Total	%	0.65
Lysine Total	%	3.37
Methionine Total	%	0.74
Methionine + Cystine	%	1.50
Arginine	%	3.98
Tryptophan	%	0.62
Valine	%	2.67
Glycine	%	2.24
Histidine	%	1.47
Phenylalanine	%	2.82
Threonine	%	2.05
Leucine	%	4.17
Isoleucine	%	2.58
Choline	%	1250.00
Sodium	%	0.03
Potassium	%	2.07
Linoleic Acid	%	0.37
Sulfur	%	0.43
Dry Matter	%	88.00

RESULTS AND DISCUSSION

Turkey weights, feed conversion ratios (FCR), and livability results are shown in Table 3. Birds were weighed at placement and then weighed weekly using a cart scale. No significant differences were observed in average final body weights or mortality-adjusted FCR between turkeys fed diets containing conventional soybean meal (SBM), UHP-LO SBM formulated as recommended, or UHP-LO SBM formulated with no energy credit. However, positive numerical trends were observed for UHP-LO SBM formulated as recommended, with this treatment exhibiting numerically larger birds and improved FCR. Bird livability was not significantly affected by diet, but this performance metric also showed a numerical trend favoring UHP-LO SBM formulated as recommended. These findings highlight the potential advantages of incorporating UHP-LO SBM as a high-protein, energy-dense ingredient in turkey diet formulations.

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

	Livability (%)	Final body weight adjusted by mortality (lbs)	Mortality adjusted FCR	Mortality and body weight adjusted FCR
CG UHP-LO	74.0	49.99	2.332	2.157
CG UHP-LO no energy credit	71.4	47.22	2.466	2.388
Conventional SBM	71.4	48.76	2.426	2.294

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

*FCR adjusted to 45 pounds utilizing 0.035 points FC per pound of weight

White meat yield is summarized in Table 4. No significant differences were observed in white meat yield among treatments, either measured as a weight (lbs) or as a percentage of live weight. However, a positive numerical trend was observed for UHP-LO SBM formulated as recommended, with this treatment showing higher white meat yield by weight compared to the other two treatments. These results highlight the potential advantages of UHP-LO SBM, which combines higher energy content with lower levels of anti-nutritional factors. This combined benefit may improve white meat yield at scale, contributing to increased revenue from premium meat cuts.

TABLE 4. WHITE MEAT YIELD

	White meat	Hot carcass yield (%)
CG UHP-LO	14.84	29.7%
CG UHP-LO no energy credit	14.00	29.6%
Conventional SBM	14.01	28.7%

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

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 superior ingredient in turkey 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. Specially, the performance of the treatment diet formulated with UHP-LO SBM with the 80 kcal/lb energy credit validates prior academic studies demonstrating higher levels metabolizable energy in a commercial production setting. The diets for this treatment had lower levels of added fat, which did not impact growth performance in a negative way. The inclusion of UHP-LO SBM was shown to improve growth performance and livability compared to turkeys fed conventional SBM, as well as enhance yields of high-value white meat. These results confirm the suitability of UHP-LO SBM as a premium feed ingredient capable of driving both profitability and production efficiency in the poultry industry.

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About Confluence

Confluence Genetics is a seed innovation company where the forces of nature and technology converge—unlocking the genetic diversity of soy quality traits through proprietary genetics, its AI-driven CropOS® platform, and its Crop Accelerator. Confluence Genetics collaborates with strategic partners throughout the agribusiness value chain to meet the demand for better feed, food, and fuel. More information can be found at confluence.ag.

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