

Atlantic Poultry Research Institute

APRI FACTS



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EXTRUDED FULL-FAT SOYBEANS FOR BROILER TURKEYS

Introduction

High feed prices and the termination of feed freight assistance has forced Atlantic poultry producers into finding cost-effective feed alternatives. Since there are no oil extraction plants for soybeans in the Atlantic region, if the crop is grown this means homegrown full-fat soybeans can be used as a lower priced protein supplement due to the elimination of freight charges for transportation from Ontario and the Western provinces. In addition to being a high quality protein source, oil retained within the whole bean makes soybeans an excellent source of energy. Raw soybean use by poultry is limited by heat-labile trypsin inhibitors, therefore soybeans have to be heat treated before use to destroy the inhibitor. A previous study indicated that roasted soybeans can partially or totally replace soybean meal in turkey diets. A leaner bird was produced using roasted soybeans in the starter diet (Burgoyne et al. 1997). Extrusion offers an alternative method of processing the raw soybeans where roasting is unavailable.

Trial

Extruded soybeans were incorporated into a corn-based turkey starter diet at a level of 15% and compared to a control diet using the normal soybean meal. The grower and finisher diets tested contained

extruded full-fat soybeans and soybean meal in one of the following ratios: 0:100, 33.3:66.6, 66.6:33.3, and 100:0, with nutrient compositions as described in Table 1.

Table 1: Diet Characteristics

Age (Days)	Diet	CP (%)	Energy (kcal/kg)
0-21	Starter	26	3000
22-63	Grower	20	3176
64-84	Finisher	17	3252

Results

At 21 days of age, the birds fed the starter diet with 15% extruded soybeans ate less feed, gained less weight and had a poorer feed conversion (Table 2). Birds fed the grower/finisher diets with the soybean meal partially or totally replaced with extruded soybeans had heavier body weights and were more efficient at 63 days of age. However, at 84 days of age, body weights were not different (Figure 1) and birds fed extruded soybeans were less efficient (Figure 2). Using extruded soybeans in the starter diet did not affect carcass protein or fat content. Partial or complete replacement of soybean meal by extruded soybeans in the grower/finisher diets resulted in more carcass protein and less fat content at 63 days of age (Figure 3), however this effect disappeared at 84 days of age.

Industry Impact

Extruded full-fat soybeans can partially or totally replace soybean meal efficiently in turkey diets up to 63 days of age. The use of locally grown soybeans will eliminate the costs of long distance transport of this feedstuff. A leaner bird was produced using the extruded full-fat soybeans in the grower diets. Using local supplies of soybeans, extruded or roasted at local facilities, means a potential economic gain in providing the poultry industry with a lower priced alternative feedstuff that can be easily incorporated into poultry rations.

Table 2: Effect of Extruded Soybeans in the Starter Diet on Growth Performance

Variable	Level of Extruded Soybeans in Starter Diets (%)	
	0	15
Weight Gain (kg/bird) ¹		
1-21 d	0.48a	0.35b
Feed Consumption (kg/bird)		
1-21 d	0.60a	0.51b
Feed Efficiency (feed/gain)		
1-21 d	1.26b	1.45a

¹Average day-old body weight=0.051 kg

a,b Means are significantly different (P<0.05)

Figure 1. Effect of Extruded Soybeans in the Grower and Finisher Diets on Body Weights

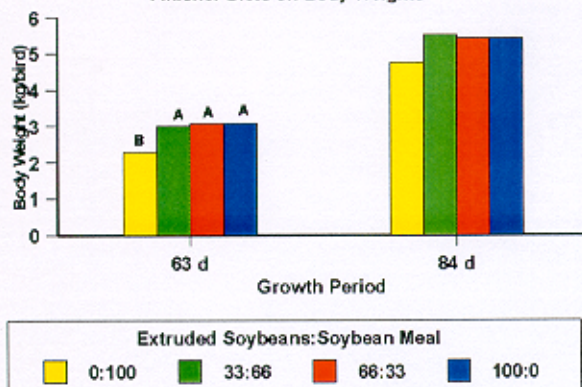


Figure 2. Effect of Extruded Soybeans in the Grower and Finisher Diets on Feed Efficiency

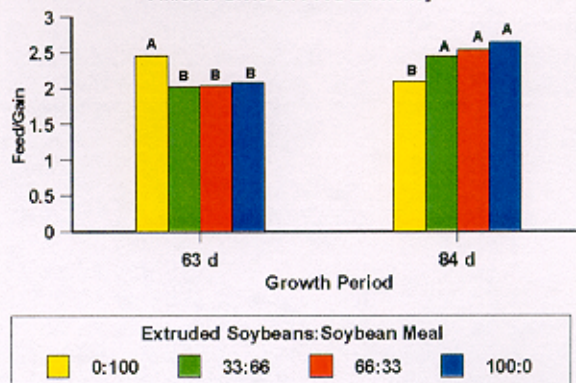
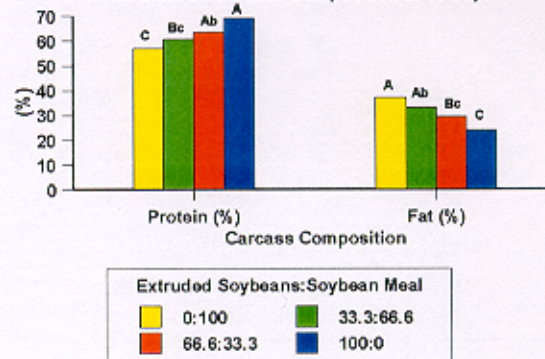


Figure 3. Effect of Extruded Soybeans in the Grower and Finisher Diets on Carcass Composition at 63 Days



Reference

Burgoyne, K.L, MacLean, J.L., and Anderson, D.M. 1997. APRI Fact Sheet #2.

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 Ontario Soybean Growers' Marketing Board
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