

Atlantic Poultry Research Institute

APRI FACTS



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FULL-FAT OIL SEEDS FOR LAYING HENS

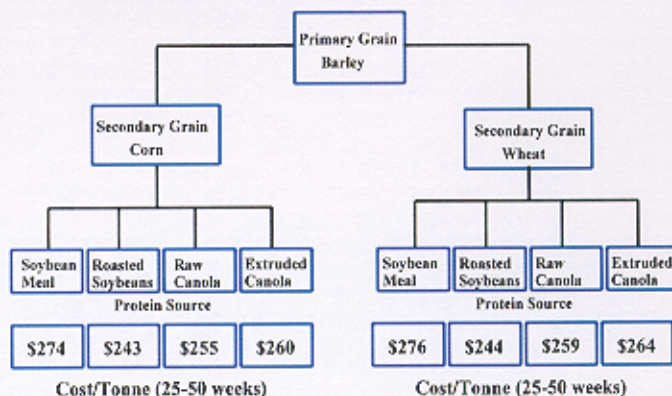
INTRODUCTION

Traditionally, imported soybean meal and corn has been the primary sources of plant protein and cereal grain in poultry diets. Poultry rations are typically generated using computer-formulated least-cost rations based on the choice of ingredients and in the current market price. Using locally grown ingredients, could be of great economic advantage to the producer. Both full-fat soybeans and full-fat canola are grown in Atlantic Canada. Full-fat oil seeds can be used as partial replacements for soybean meal and animal or vegetable fat in laying hen diets. The trypsin inhibitor raw soybean limits its use in poultry diets unless heat is used to destroy the inhibitor. On the other hand information on the effects of heat treatment of canola seeds is limited. Western Canada uses combinations of barley and canola meal intensively which bodes well for our region. Barley is a major cereal grain crop grown in the Atlantic region. Previous APRI research indicates barley could be used in layer diets up to a level of 60% with optimum economic returns occurring at a level of 45% (Hamilton and Proudfoot 1993).

Trial

The effects of using full-fat oil seeds as partial replacements of soybean meal (SBM) and animal fat in barley-based diets was studied. Corn or wheat was the secondary grain source. Leghorn were fed a diet containing soybean meal, or 20% roasted soybeans (RSB), or 10% raw (RWCS) or 10% extruded canola seeds (EXCS) (Figure 1).

FIGURE 1. DIETARY TREATMENTS



RESULTS

Productive Performance:

Throughout the trial, birds fed SBM, RSB, RWCS or EXCS had similar:

- body weights
- feed consumption
- feed efficiency
- egg specific gravities
- egg Haugh Units

The source of protein resulted in significant differences in:

- hen-day egg production (Table 1)
- egg weights (Table 2)

Table 1. Effect of Protein Source on Hen-Day Egg Production (HD)

HD (%)	Protein Source				
	SBM	RSB	RWCS	EXCS	
56-60 wks		81.5 ^b	88.2 ^a	81.7 ^b	79.8 ^b
60-64 wks		83.3 ^{ab}	87.9 ^a	80.3 ^b	79.8 ^b

a,b Means within the same row with different letters differ significantly ($P \leq 0.05$)

Hens fed the roasted soybean and barley diet had significantly higher hen-day production (Table 1) 56-60 weeks of age and higher compared to those fed the RWCS and EXCS 60-64 weeks of age.

Table 2. Effect of Protein Source on Egg Weights

Wt (g/egg)	Protein Source			
	SBM	RSB	RWCS	EXCS
32 wks	61.5 ^{ab}	63.9 ^a	60.0 ^b	61.6 ^{ab}
36 wks	61.3	64.1	61.1	61.8
40 wks	62.5 ^b	65.3 ^a	60.8 ^b	63.0 ^{ab}
44 wks	63.7 ^b	66.2 ^a	62.3 ^b	63.7 ^b
48 wks	62.5 ^b	66.6 ^a	63.3 ^b	64.2 ^{ab}
52 wks	64.1	68.0	63.7	65.0
56 wks	65.3	68.0	64.4	66.1
60 wks	65.2	67.9	63.3	65.8
64 wks	66.8	69.5	65.5	67.4

a,b Means within the same row with different letters differ significantly ($P \leq 0.05$)

Birds fed the RSB diet consistently produced heavier eggs (Table 2) starting at 32 weeks of age. At 44 weeks of age, eggs from the RSB-fed birds were significantly heavier than those from the other protein sources. Also of interest is that the EXCS followed a similar pattern as being heavier than the 2 other treatments throughout the trial.

Throughout the trial, using corn or wheat as the secondary grain source in the barley-based diets did not significantly affect productive performance.

Comparative Cost of Diets:

Without prices for local canola established full-fat canola seeds prices were related to the full-fat canola seeds available for the crushing industry (Winnipeg Commodity Exchange). From Figure 1, using the diets fed from 25-50 weeks of age as the example, diets containing either roasted soybeans or canola seeds, raw or roasted, were less expensive than those containing soybean meal.

Industry Impact

Results suggest full-fat oil seeds are potential partial replacements for soybean meal and supplemental animal fat, (especially roasted soybeans) during the later stages of production. Using locally grown full-fat oil seeds eliminates the costs of long distance transport of these feedstuffs. Using local supplies means a potential economic gain in providing the poultry industry with a cost effective alternative feedstuff, that can be easily incorporated into layer diets. The current trial also indicates no beneficial impact from extruding full-fat canola seeds, therefore, eliminating the cost of processing. Optimizing the use of barley with locally grown full-fat oil seeds offers potential alternatives which can be incorporated into least-cost feed formulations for laying hens.

Reference

Hamilton, R.M.G. and Proudfoot, F.G. 1993. Can. J. Anim. Sci. 73: 625-634.

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