

# APRI FACTS

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**FACTSHEET #16**  
**July 2002**

## **EFFECT OF FEEDING HEMP SEED MEAL TO LAYING HENS**

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### **Introduction**

In Canada, it has been legal to grow cannabis cultivars with low levels of tetrahydrocannabinol since 1998. Hemp is grown for fibre or for seed, which is rich in long chain unsaturated fatty acids. Pressing the seed leaves a high protein meal containing variable amounts of oil.

Poultry diets are usually formulated around a cereal as the main source of energy, with an oilseed meal as the major supplement to the protein in the cereal. Hemp seeds contain 32 to 38% oil (Hullar et al., 1999; Yazicioğlu and Karaali, 1983) which is pressed from the seed and marketed as a health-promoting product because of the balance of long chain fatty acids (Erasmus, 1993). Studies have shown that linoleic acid is important for obtaining maximum egg size while linolenic acid is beneficial for human health.

The scientific literature is almost devoid of mention of hemp seed meal use in animal feeds. In recent years it has been demonstrated that hemp seed can be fed to pigeons and the meal has been investigated for feeding to fish and cattle. Hemp seed meal provided in the diets of laying hens may provide an alternate feed source rich in protein, while providing energy and altering the fatty acid composition of eggs produced.

### **Trial**

HSM from a cultivar normally grown for fibre (Unica-b) was provided in the diets of laying hens at levels of 0, 5, 10, and 20% (Table 1). These diets were provided for 4 weeks, starting at 42 weeks of age. The HSM contained 30.7% CP, 16.4% oil, and estimated to have 2840 kcal/kg AME.

**Table 1. Diet Composition**

Ingredient	DIET (%)			
	1	2	3	4
Corn	58.8	56.6	54.4	50.0
SBM	27.4	24.5	21.7	15.9
<b>HSM</b>	<b>0</b>	<b>5.0</b>	<b>10.0</b>	<b>20.0</b>
Ground Limestone	9.89	9.88	9.87	9.86
Poultry Fat	2.01	2.03	2.05	2.09
Calcium Phosphate	1.06	1.12	1.19	1.31
Salt	0.27	0.27	0.28	0.28
Vit/Min. Premix	0.50	0.50	0.50	0.50
DL methionine	0.043	0.043	0.043	0.042

### **Results**

Egg production, feed consumption, feed efficiency, and body weight were not affected by increasing levels of HSM in the diets (Table 2).

**Table 2. Effect of Level of HSM on Hen Production**

Parameter	LEVEL OF HSM (%)			
	0	5	10	20
<i>Egg Production (Hen-d-%)</i>	85.2	91.6	82.7	85.5
<i>Feed Consumption (g/bird/d)</i>	101.3	102.3	102.0	103.7
<i>Feed Efficiency (feed/egg)</i>	1.91	1.79	1.97	1.96
<i>Body Weight Change (g)</i>	-37.0	-21.4	-41.4	-37.4

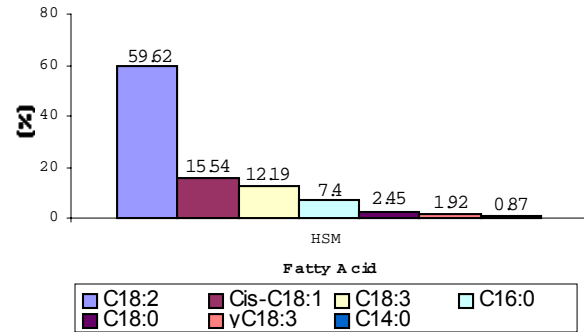
There was no significant effect of diet on albumen height, egg weight, or the weight of any of the three egg components (Table 3).

**Table 3. Effect of Hemp Seed Meal on Egg Quality**

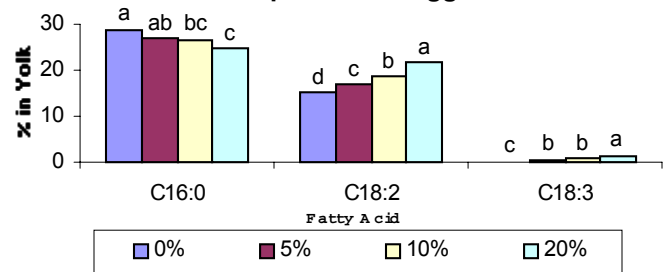
Parameter	LEVEL OF HSM (%)			
	0	5	10	20
<i>Albumen Height (mm)</i>	7.9	8.1	8.1	7.9
<i>Egg Weight (g)</i>	62.71	62.24	62.61	62.46
<i>Yolk Weight (g)</i>	16.56	16.48	16.68	16.65
<i>Albumen Weight (g)</i>	40.56	40.14	40.46	40.23
<i>Shell Weight (g)</i>	5.59	5.55	5.47	5.57

The predominant fatty acid in the HSM was linoleic acid (C18:2), with important amounts of oleic acid (Cis-C18:1),  $\alpha$ -linolenic acid (C18:3), and palmitic acid (C16:0), and lesser amounts of stearic acid (C18:0),  $\gamma$ -linolenic acid ( $\gamma$ C18:3), and myristic acid (C14:0) (Fig. 1). The ratio of Omega-6 (linoleic plus  $\gamma$ -linolenic acid) to Omega-3 ( $\alpha$ -linolenic) fatty acids in the HSM was 5:1. Increasing the amount of HSM in the diet lowered the percentage of palmitic acid in the yolk, and increased the percentages of linoleic and  $\alpha$ -linolenic acids (Fig. 2).

**Figure 1. Fatty Acid Composition of HSM**



**Figure 2. Effect of Dietary HSM on Fatty Acid Composition of Egg Yolk**



## Conclusions

Hemp seed meal can be fed to laying hens with no adverse effects. It is a valuable source of protein, energy, and long chain fatty acids. Providing hemp seed meal in the diets of laying hens alters the fatty acid composition of the eggs.

## References

- Erasmus, U. 1993.** Fats that Heal, Fats that Kill, 3<sup>rd</sup> edition. Alive Books, Burnaby, BC, Canada.
- Hullar, I., Meleg, I., Fekete, S. and Romvari, R. 1999.** Poultry Sci. 78:1757-1762.
- Yazicioğlu, T. and Karaali, A. 1983.** Fette. Seifen Anstrichm. 85:23-29.

### Funding Source:

Nova Scotia Department of Agriculture & Fisheries – Agri-Focus 2000, APRI, and thanks to Annapolis Valley Hemp for the gift of the hempseed meal.

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