

Director's Digest



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DETERMINATION OF THE VALUE OF FEATHER MEAL IN BROILER DIETS

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The nutritive and economic values of feather meal are higher than commonly recognized. Our experiments show that the metabolizable energy of feather meal should be about 3.07 Kcal/g, not the 2.36 Kcal/g reported by the NRC. This results in an increase in the economic value of feather of about \$31.00/ton in corn and soybean oil meal based broiler diets.

We have two main reasons for suspecting the metabolizable energy of feather meal was underestimated. First, our earlier studies with poultry by-product meal had shown that chick assays with high levels of inclusion of the test ingredient gave low estimates. This has been observed by others for meat meal as well. Second, since almost all the energy in feather meal comes from protein (and the oil is believed to be 100% absorbed), protein digestion and absorption would only be about 60% to give the ME value listed in most tables. We think it should be above 80%.

All the table value estimates of the metabolizable energy of feather meal came from a few determinations with chicks fed 40% feather meal. We found that indeed when 40% feather meal is fed the values are close to those reported by the NRC and others. However, when a lower level, 20% is fed, the metabolizable energy value is higher.

When chicks are fed the high levels of animal protein, they just can not digest and absorb it like they can at much lower feeding levels. It is the metabolizability at low, practical levels, that is important. The chick assays are not reliable when low levels, 5 or 10% are fed. Therefore the estimate of

3.07 Kcal/g is from extrapolating from the 20 and 40% levels and from the rapid assays with roosters.

The meaningful question to answer is just how important the difference in metabolizable energy is in economic terms. To evaluate this, the technique of parametric linear programming was used. Model broiler starter and finisher diets were formulated using National Research Council specifications for nutrient requirements and Feedstuffs Magazine prices for Atlanta in January 1989.

This technique answers the question of how much the nutrients in feather meal are worth compared to purchasing the same nutrients from other ingredients whose prices are known. The values listed in TABLE 1 are the highest ones at which feather meal would be included in the diets. If the prices were raised \$1.00 per ton, feather meal would not be used at all.

Conversely, if the price of feather meal were lowered \$1.00 per ton, savings to the producer would be \$0.05/ton (assuming a usage rate of 5%). At the published market price of \$287/ton a producer would be saving \$7.08/ton of broiler starter. This is a very large savings for companies producing thousands of tons of feed weekly.

TABLE 1 illustrates several very interesting points about the values of ingredients relative to one another. First, when the ME content of feather meal goes up, its economic value goes up and the use of poultry oil goes down. Therefore the value of feather meal will be closely related to the value of poultry oil.

Second, the value of feather meal is higher in corn-soy based diets than in wheat-soy based diets. Wheat has about 60% more protein than corn. When wheat is the major source of energy, more wheat protein is present, and so the protein in feather meal is less valuable.

Third, the nutrient requirements of the diet in question are very important. The value of feather meal is very low in a wheat-soy based finisher. In the finisher diet more energy and less protein are required. There is already an excess of protein when wheat, soybean meal and poultry oil supply most of the energy. The protein in feather meal is therefore essentially without value under these circumstances.

In conclusion, feather meal should be worth more to broiler producers than the current market value. The actual value will depend on the particular diets that the producer is feeding. What is feather meal worth to each producer? That is dependent on the nutrient composition of the ingredients he can buy, the nutrients specified for each diet, and the prices of all the other ingredients that can be substituted for feather meal.

Table I. The value of feather meal in typical broiler rations using January 1989 Atlanta prices.*

	<u>M.E. Content of FM</u>	
Corn-Soy Based Diets	<u>2.36 Kcal/g</u>	<u>3.07 kcal/g</u>
Starter	\$397/ton	\$429/ton
Finisher	399	430
Wheat-Soy Based Diets		
Starter	371	398
Finisher	94	113

*Value determined by parametric linear programming.

The market price of Feather Meal was \$287.50/ton.