

Agri *Resource*

METABOLIZABLE ENERGY Evaluating Poultry Feed Ingredients

Proper formulation of poultry diets is imperative to ensure optimal poultry production. Understanding the nutritional requirements of poultry, in combination with the nutritional value of individual feed ingredients, ensures that the formulation of the poultry feed is financially sound.

In order to assist poultry producers in evaluating feed ingredients, Agri Analysis now offers a Metabolizable Energy (MEn) value on a number of poultry feed ingredients:

- corn grain
- wheat
- wheat midds
- oats and oak products
- bakery by-products
- distillers
- soybeans, expeller*
- soybeans, solvent*
- soybeans, heat-treated, meal*
- corn gluten meal (65% crude protein)

* Soybean processes are clarified on page 2

Why test for Metabolizable Energy (MEn)?

Energy is the most expensive nutrient in a diet! Thus, it is helpful to have an analytical measure of energy when poultry producers are formulating diets. By definition, the energy in a feed ingredient is referred to as the net energy (NE). While NE will provide a more accurate available energy result, it is very difficult to assay and is not used routinely. Instead, poultry producers utilize Metabolizable Energy (MEn) as the current system of choice when looking to compare the quality of individual feed ingredients and formulate a finished feed.

In order to offer this at our laboratory, we can calculate MEn of individual feed ingredients by adding Ash analysis to 3 of our existing feed test packages: AG4, AG5, or AG7. Customers that would prefer not to have MEn calculated on their feed ingredients can still request these packages without the addition of ash.

To obtain MEn values on your poultry feed ingredients, request one of the following tests:

<u>Code</u>	<u>Test</u>
AG4A	Dry Matter, Crude Protein, Fat, Crude Fiber, P, Ca, Ash, & MEn
AG5A	Dry Matter, Crude Protein, Fat, Crude Fiber, P, Ca, Na, Ash, & MEn
AG7A	Dry Matter, Crude Protein, Fat, Crude Fiber, Na, Ash, & MEn

Table 1: Composition of Some Feeds Commonly Used for Poultry (data on an as fed basis)

Feed name Description	Dry Matter %	MEn (kcal/kg)	Protein %	Fat % (Ether Extract)	Crude Fiber %
Corn grains	89	3,350	8.5	3.8	2.2
Wheat, hard winter	87	2,900	14.1	2.5	3.0
Wheat midds	88	2,000	15.0	3.0	7.5
Oats & oat products	89	2,550	11.4	4.2	10.8
Barley	89	2,640	11.0	1.8	5.5
Soybeans, heat-treated, meal	90	3,300	37.0	18.0	5.5
Soybean meal, expeller	89	2,230	44.0	0.8	7.0
Soybean meal, solvent	90	2,440	48.5	1.0	3.9
Bakery by-products	92	3,862	10.5	11.7	1.2
Distillers	94	1,972	27.8	9.2	12.0
Corn gluten meal (60% crude protein)	90	3,720	62.0	2.5	1.3

Reference: Nutrient Requirements of Poultry: Ninth Revised Edition (1994)

*** Soybean processing terms**

Raw soybeans are processed into meal by any of the following 4 methods:

Solvent Extraction:

Soybeans are first cracked and de-hulled, then heated to approximately 60 degrees Celsius C for about 10 minutes. After the cracked beans are heated they proceed through a series of grinding rollers where they are flaked. The flakes are allowed to cool to about 45 degrees C and are then conveyed to the extraction equipment where the oil is removed by the solvent in one of several countercurrent extraction systems. The extracted flakes then proceed to dryers where the solvent is volatilized. From there the flakes are conveyed to a toaster and finally cooled and ground.

Expeller Extraction:

Soybeans are initially cleaned, cracked and dried. The dried soybeans are then transported to tempering devices and heated uniformly. From the tempering bins, the soybeans are fed into expeller presses. A central revolving shaft creates pressure within the press causing the extraction of oil from the ground soybeans. The extracted beans leave the presses in the form of flakes which are then ground.

Extrusion:

Soybeans are fed into an extruder barrel where a central revolving shaft forces the beans through the extruder. The technique creates sufficient heat through friction to destroy the trypsin-inhibiting enzymes. Steam is frequently injected during the process. No oil is removed from the soybeans during extrusion. The beans are processed into meal through pressure and heat of friction.

Roasting:

Roasting of soybeans involves a revolving cylinder which lifts the beans through jets of flame. Soybeans leaving the cylinders may reach a temperature of 65 degrees C.