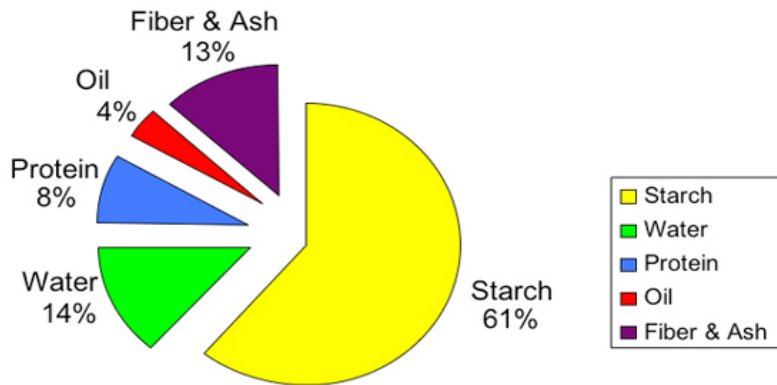


# Debunking Myths around Corn Gluten Meal

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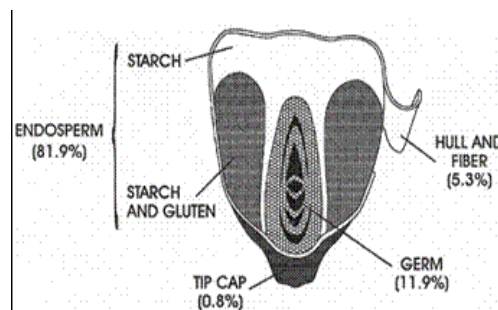
Corn has been a staple food source for humans for centuries providing an excellent source of energy at a reasonable cost. Corn contains approximately 60% carbohydrate, 8% protein and 4% fat (in the form of oil). Each of these nutrients found in corn provides unique benefits to the animals. The following figure demonstrates the approximate composition of corn grains.



Typical composition of #2 yellow corn

## Understanding terms about corn & corn co-products:

- Ground corn or corn meal is whole corn that is finely chopped & ground.
- Corn grits is a carbohydrate source. It is the portion of ground corn containing little to no bran (fiber) or germ.
- Corn gluten meal is a dried protein portion where a great deal of the carbohydrate, oil and fiber is removed.
- Corn bran is the outer coating of the corn kernel and is largely fiber.



Let's look at the benefits provided by the nutrients found in corn.

Oil in corn provides 2.25 times the metabolizable energy per unit weight as carbohydrate. How is this helpful in pet foods? By incorporating corn, we can increase the energy of the diet without increasing the volume of food consumption. Within the oil content, corn is specifically high in linoleic acid. Linoleic acid is a dietary essential fatty acid as dog and cat bodies cannot synthesize it. Therefore, it **MUST** be added to dog and cat diets. Linoleic acid is a component of the ceramide in skin and thus contributes to a healthy coat and skin.

Starch (complex carbohydrates) in the corn provides an excellent source of energy at a reasonable cost. It's a myth that corn is not digested by dogs and cats. When corn is ground and cooked, over 90% of the carbohydrate portion of corn can be digested.

The protein portion of corn is called "Corn gluten". Its digestibility is as high as 95% in the small intestine. Corn gluten meal's amino acid profile is quite different from meat-based protein sources. It is particularly high in the sulphur containing amino acids, cystine and methionine. It is beneficial in acidifying urine which helps in dietary management of urinary calculi. Another benefit of corn gluten meal is that it has relatively low levels of ash and very low phosphorus. Low phosphorus in the diets of the kidney patients is a desirable feature and corn gluten meal fulfills that role.

Another key nutrient that corn supplies is a blend of carotenoids. Carotenoids are nutrients that are converted to vitamin A. Other biologic functions that involve carotenoids are vision, skin health, reproduction, and bone and muscle growth. They also have a role as antioxidants.

In Summary, the benefits of corn are:

- (1) Ground and cooked corn is more than **90% digestible**.
- (2) Corn is an excellent source of linoleic acid, which is a **dietary essential fatty acid**.
- (3) When combined with meat, chicken or fish, corn provides an **excellent source of complimentary protein** which is rich in methionine & cysteine (sulphur containing amino acids).

(4) Whole corn is an excellent source of **insoluble dietary fibers** (corn bran) which provides bulk in the digestive system.

### **Corn Gluten Meal (CGM):**

Corn gluten meal (CGM) is a co-product from corn wet milling, the process responsible for production of corn sweeteners and corn syrup. In the wet milling process, corn is cleaned and then steeped in a water/sulfur dioxide mixture at 50°C. This acidic stew activates the inherent lactobacillus organisms, which begin to break down the corn seed.<sup>1</sup>

The water and germ are then separated from the flint and protein by a water cyclone and the resulting material is ground. Hulls are removed by screening and the protein is separated from the starch by centrifugation. The protein (gluten) mash is then dried and sized.

Corn gluten consists of four major classes of protein: Albumins, globulins, glutelins and zein (prolimines). While corn gluten doesn't have the same level of functionality as wheat gluten for bread production, it does retain some functional proteins that are beneficial in extrusion.<sup>1</sup>

### Separation of corn parts



## Why add CGM in petfoods?

Most of the available CGM contains about 70% protein. It is an excellent source of methionine & cysteine, which are beneficial while acidifying the urine to prevent and/or manage urinary calculi. Because of this, CGM is typically combined with another animal or plant protein source.

Additionally, when compared to other proteins, CGM has a low level of ash (< 2.0%) and a full complement of vitamins and xanthophylls such as zeaxanthin and lutein.<sup>1</sup>

Zeaxanthin and lutein are antioxidants and protect the vision.

### **Facts, myths and misconceptions about corn:**

<b>Misinformation about corn &amp; CGM</b>	<b>Facts about corn &amp; CGM</b>
(1) Corn is not digested by dogs and cats	No mammal can digest the intact corn kernel. However, when corn kernels are ground and cooked, corn is >90% digestible.
(2) Corn & CGM are cheap ingredients and added to cheapen the food	High quality of corn and CGM are expensive ingredients.
(3) Corn and CGM are fillers	The term “filler” means that it has no nutritional or beneficial value to the pet. Both, corn and CGM, provide a number of beneficial nutrients to improve the animal health
(4) Corn & CGM cause allergies in pets	The incidence of “True food allergies” is very low. In fact, animal proteins are potentially more allergic than plant proteins. Studies show an incidence rate of 1.5% of adverse reactions to food may be caused by corn or CGM.
(5) The cob is added along with corn kernels	Cob is never added in the pet foods.

### References:

1. Aldrich, G., Pet Food Industry Magazine, May, 2007

2. Evaluation of selected high-starch flours as ingredients in canine diets.  
Murray SM, Fahey GC Jr, Merchen NR, Sunvold GD, Reinhart GA. *J Anim Sci.* 1999 Aug;77(8):2180-6.