



Wet vs. Dry

Byproducts of ethanol industry can vary based on type of production, source and individual load.

by Troy Smith

Grain ethanol really isn't a new fuel alternative. According to Nebraska Corn Board spokesman Randy Klein, ethanol was used to fuel lamps even before the Civil War. As early as the 1920s, it was used as a fuel octane enhancement when blended (10%) with gasoline. Nor do the byproducts of distillery processes represent a novel source of animal nutrition. The mash left over from making whiskey — either by legitimate distillers or moonshiners — has been fed to livestock for more than 100 years.

But the rapidly growing ethanol industry has brought increased availability of a variety of byproduct feeds. They vary by the ethanol production processes from which they result and by the further-processing measures manufacturers are applying to make byproduct feeds more marketable. The speed with which all of this is occurring has caused

some confusion among livestock producers.

The situation has spawned a flurry of educational meetings through which Extension educators and feed manufacturers present information and dispel misconceptions. In most cases, the take-home message is that not all corn-milling industry byproducts are created equal. For example, very different byproducts result from wet milling versus dry-grind processes associated with ethanol production.

Wet milling involves soaking or steeping whole corn to soften the kernels, after which further processing separates components used in a variety of products. In general, ethanol is not the primary focus for wet milling processors. They go after the starch fraction of the corn kernel for use in products for human consumption including dried cornstarch, corn syrup and high-fructose sweetener.

Oil is extracted and sold as corn oil. Some starch may also be converted to dextrose and fermented to create ethanol. The principal wet milling byproduct used for livestock feed is corn gluten meal.

Typically, fuel ethanol production is the primary goal of dry-grind processors. While corn has become the most common raw material, sorghum and other grains can be used in this process. The grain is ground, heated and fermented, converting the starch into alcohol (ethanol). Distillation to remove the ethanol leaves wet distillers grains and distillers solubles. Either byproduct can be sold separately, or the solubles can be condensed into syrup and added back to the distillers grains.

Many livestock producers misunderstand the differences between distillers grains and corn gluten feed. Generally, corn gluten feed's energy value is equal to, or slightly higher than, that of corn grain. Dried corn gluten feed's energy content is lower than corn's. Distillers grains, which still contains fat (11-12%), offers about 15% more energy than corn grain.

With regard to protein, corn gluten feed levels usually range from 19-24% crude protein (dry-matter basis), compared to about 30% for distillers grains. Also, 80% of the protein in corn gluten feed is rumen degradable. About 35% of the protein in distillers grains is rumen degradable, with 65% consisting of undegradable protein, which bypasses the rumen and is absorbed in the intestine.

The greatest differences among distillers grains products currently marketed relate to moisture content, but products are reported to be variable in nutrient content too. Unfortunately, the various terms and associated acronyms can lend confusion to the

discussion of product differences.

Wet distillers grains (WDG), sometimes called distillers wet grains (DWG), contain 65-75% moisture. And while condensed distillers solubles are sold as a separate feed product, it has become common for processors to add solubles back to distillers grains. Therefore, producers can choose wet distillers grains with solubles (WDGS), which is about 30% dry matter or dried distillers grains with solubles (DDGS) marketed at about 90%

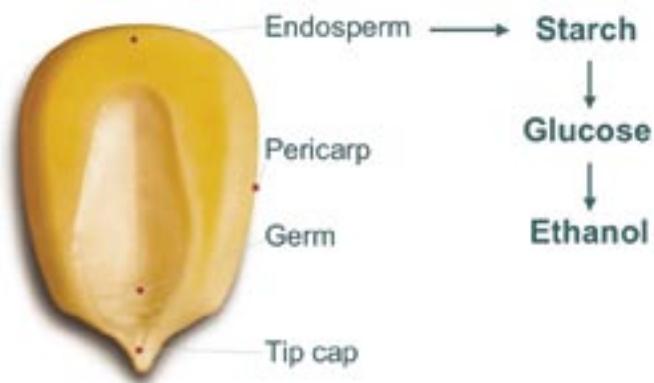
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dry matter. Some manufacturers, seeking to reduce some of the bulk and weight associated with wet product, offer modified distillers grains with solubles (MDGS) at 50% dry matter.

That's a lot of alphabet soup to digest, so the specialists advise producers to do their homework before deciding which byproduct feed best suits their own operation. Because nutrient analyses vary among types of byproduct feeds, their sources, and individual loads from a common source, testing of each load is preferred. That may not be practical when using a product of limited shelf life, so the minimum dry matter should be determined to assess how many tons or pounds of dry matter are purchased and fed to cattle. **HW**

Editor's Note: Article based on information supplied by South Dakota State University, University of Nebraska and Iowa State University.

Figure 1: The corn kernel



National Corn Growers Association

Figure 2: The wet-milling process

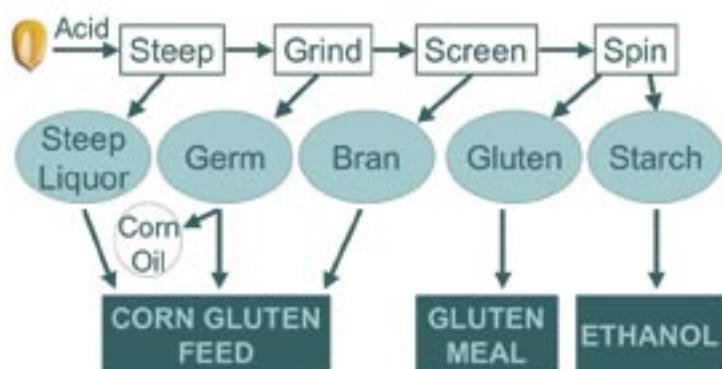


Figure 3: The dry-milling process

