

Wet ethanol production process yields more ethanol and more co-products

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Using a wet ethanol production method that begins by soaking corn kernels rather than grinding them, results in more gallons of ethanol and more usable co-products, giving ethanol producers a bigger bang for their buck - by about 20 percent.

"The conventional [ethanol production](#) method has fewer steps, but other than distillers dried grains with soluble, it doesn't have any other co-products," said University of Illinois Agricultural Engineer Esha Khullar. "Whereas in both wet and dry fractionation processes, the result is ethanol, distillers dried grains with soluble, as well as germ and fiber. [Corn](#) fiber oil for example can be extracted from the fiber and used as heart-healthy additives in buttery spreads that can lower cholesterol."

In comparing the wet and dry fractionation methods, Khullar's research team found that when using the wet fractionation method, the result is even higher ethanol concentrations coming out of the fermenter and better quality co-products than the dry method.

In the wet process, the [corn kernels](#) are soaked, washing the germ, which Khullar says is a cleaner separation. "There's not a lot of starch sticking to the germ. That's why you get higher oil concentrations."

After the kernels are soaked they are ground to produce a slurry. The slurry is soaked with enzymes so that it raises the specific gravity to a point where the germ starts floating and can be fished out from the top.

Khullar explained that in the dry fractionation method, the kernel is crushed, flattening out the germ. "The germ is still attached to a certain part of the endosperm and you still have a few starch pieces sticking to it. You have a very high starch content germ from the dry fractionation and that lowers the oil content. That's why there's a big difference in the wet process versus the dry process."

Dry and wet fractionation methods have been developed to separate out the germ and pericarp fiber before fermentation which is more efficient because the [germ](#) and fiber are non-fermentable. "It's better to removed them before the process. That way you have more starch in the fermenter. And you don't have to heat them and bump them and cool them," Khullar said.

The process doesn't require developing any new equipment. "It's just a modification of things that are already being done in the corn processing industry and can be done pretty easily," Khullar said.

More information: Ethanol Production from Modified and Conventional Dry-Grind Processes Using Different Corn Types was published in a 2009 issue of *Cereal Chemistry*.

Source: University of Illinois at Urbana-Champaign ([news](#) : [web](#))

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