

How does this process allow the diversification of revenue streams in ethanol production?

# Corn dry fractionation – a breakthrough in diversification

The corn-based ethanol industry is about to get a much-needed boost.

New breakthroughs in corn dry fractionation are going to provide a tremendous boost to yields and the bottom line. Cereal Process Technologies (CPT) uses dry fractionation technology prior to the ethanol process to separate components without liquids.

The technology is operational in four commercial facilities, including a commercial ethanol plant and a pilot facility. It is proven technology with new developments that greatly enhance the value. CPT is now interested in developing partnerships in the US and around the globe with forward-thinking companies.

## How does it work?

Dry fractionation occurs without water. There is no drying and there is no

wastewater. The goal of dry fractionation really is to focus on high value products. Fractionation allows diversification of revenue streams to protect against the decline of the primary revenue stream - ethanol.

There are warning signals as to why we should diversify. Ethanol and ethanol prices are under continuous attack. It is an ongoing process and it is something we must deal with now. Regulatory tinkering around the world is also an ongoing process and a battle we are going to have to face.

Market volatility is getting worse, not better. Between trade wars, pandemics and politics, just being more efficient is not enough. Sometimes you just cannot cost cut your way to profitability.

So what is dry fractionation? Basically, it is the process of milling corn into its three components.

The endosperm, the germ



The concentrated starch stream

and the bran or fibre. It has been adopted by every other agricultural processing industry over decades. Why? Because it is the most economical, efficient and cleanest method of separating the components of grains and oilseeds.

With roughly 85% of the oil residing in the germ, it can be extracted naturally and efficiently. Fractionation also yields pristine fibre that is never wet and never heated and a cleaner, more concentrated endosperm which goes into the ethanol plant and frees up processing capacity. With new breakthroughs in cellulosic technology, there is no such thing as 'starch loss'.

## Endosperm – The concentrated starch stream

Fractionation removes most of the non-fermentables, which results in natural high protein dried distillers grains (DDG).

Fractionation is the pathway to value-added

products. It allows products to be produced from the endosperm such as ethanol, alcohol for sanitisers and phosphorous-free feed.

It allows new products from the germ such as food grade corn oil, biodiesel, renewable diesel, food and feed products. It also opens food grade markets for the corn germ meal, and there are companies developing those products right now. It creates Hi-Pro DGG only, no low-pro DGG. When you remove the non-fermentable components, your only DDG stream is hi-pro. There are also higher value products from the fibre such as biogas, cellulosic ethanol and other bio-based fibre products. There is no drying in the CPT process and no wastewater in the CPT process. With a dry-mill ethanol plant, this is the only way to get food grade corn oil.

Corn fractionation takes place before entering the ethanol plant. From that process, germ comes out in its whole form along with the bran or fibre. These products

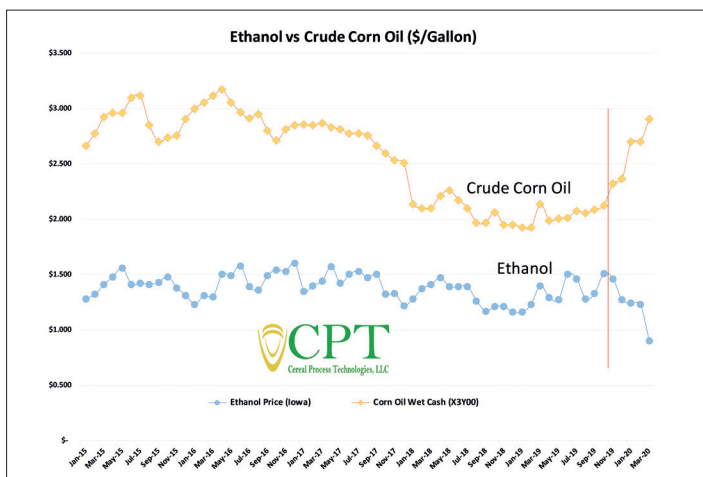
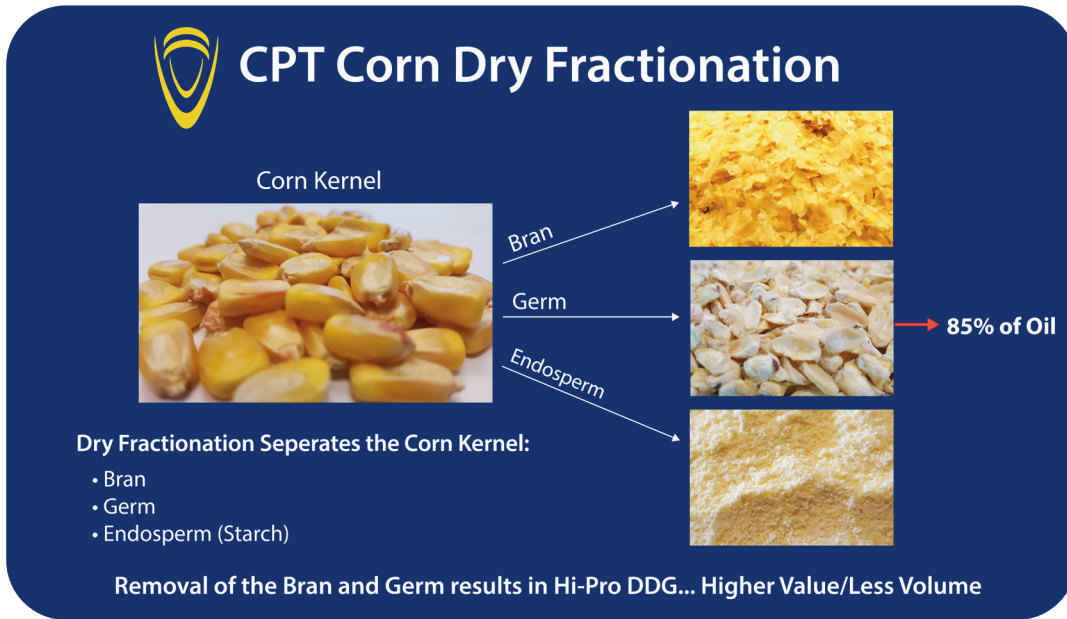


Figure 1 shows the price of ethanol against crude corn oil



The fractionation process

do not need any drying. Very simply, it is a one-step germ, one-step fibre, Hi-Pro DGG and no waste-water process.

The ethanol plant will still make ethanol, the primary product, but it will also produce cellulosic ethanol from the fibre and food grade corn oil from the germ. You can make de-oiled germ, which can be used as a feed or food ingredient, or put back into the plant to capture any remaining starch. The plant will still make distillers corn oil, just not as much.

Crude food grade corn oil (unrefined) from the corn germ is valued at about 0.49 cents (€0.41) per round. With fractionation and extraction, the plant can recover more than one pound of oil per bushel of corn. For example, if you are crushing 40 million bushels per year times 49 cents (€0.41) per pound, there would be an additional \$20 million (€16.8 million) in revenue per year just based on the oil.

The bran or fibre is removed without degradation. This gives you both high yield and high fibre quality. It is easily measurable for cellulosic calculations because the fibre is in a separate stream. Unadulterated fibre is a building block for fuel, feed, food and bio-based products.

*“Between trade wars, pandemics and politics, just being more efficient is not enough. Sometimes you just cannot cost cut your way to profitability”*

In finance, diversification is defined as “the process of allocating capital in a way that reduces exposure to any one particular asset or risk”. CPT believes ethanol companies must take advantage of downturns. We

know downturns are part of regular business cycles, so why not reduce the risk?

As you can see from Figure 1, a gallon of food grade corn oil is worth more than a gallon of ethanol. In fact, as the ethanol value

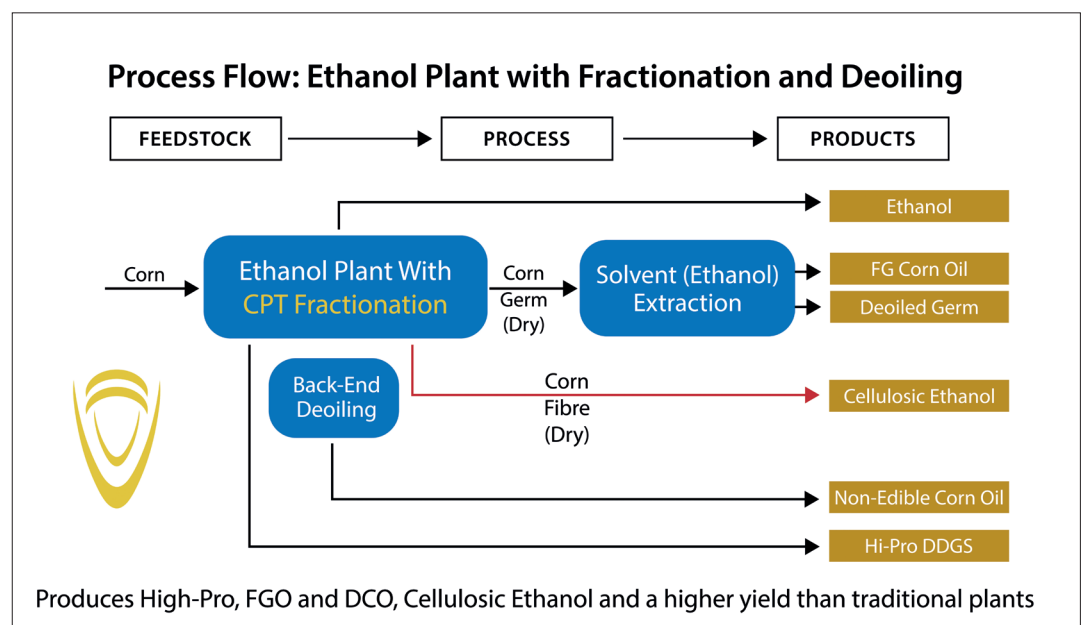
dropped, food grade corn oil increased in value over the same period of time. So diversification really is a method to spread out your risk and actually hedge your overall operation.

In regular plants, non-fermentable components become DDGs. With dry fractionation, the bulk of the non-fermentable components, which contain oil, fibre and other valuable components are removed at the front-end, so you get higher protein and higher quality DDG.

There is less protein degradation since particles with less oil dry more evenly. In addition, the load in the dryer will be cut in half, giving you better control of the dryer and lower dryer expense. The thermal load is reduced by about 35% because there is less DDG to dry.

Another significant advantage is a reduction in phosphorus and mycotoxins because they are removed on the front-end. CPT Fractionation leads to better products, better yields, added value and reduced risk for ethanol companies. ●

**For more information:**  
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The process flow