

# ROOTED IN AGRICULTURE



The history of U.S. ethanol—and indeed all domestic renewable liquid fuels—begins on the humble American farm. The industry’s growth in recent decades and its success today derive to a great extent from the thousands of farmers who worked together around the country to literally build a new market from the ground up. They invested their hard-earned money in rural biorefineries, promoted the benefits of ethanol in their communities, and collaborated with others to advocate for supportive policy. Thanks to the foresight and tenacity of those visionary farmers, today’s 200 ethanol biorefineries across the United States are living up to the potential that was first identified by some of our nation’s foremost inventors, such as Alexander Graham Bell, Henry Ford and Thomas Edison.

Notably, of the more than 310,000 jobs supported by the ethanol industry in 2024, more than two-thirds were tied to agriculture.

Modern-day facilities use state-of-the-art technologies to produce ethanol and valuable coproducts from the starches, sugars, protein and fiber found in grains and other feedstocks, and American farmers themselves are actively involved in many of the ethanol biorefining businesses through ownership, investment, or leadership roles. Corn is the predominant feedstock for U.S. ethanol production; however, many plants can process grain sorghum and cellulosic materials, including the growing use of corn kernel fiber.

Over 92 percent of U.S. grain-based ethanol produced today is processed by dry mills, with the remaining volume processed by wet mills.

In dry milling, the entire grain kernel is ground into meal, then slurried with water to form a mash. Enzymes are added to the mash to convert starch to sugar. The mash is first cooked, then cooled and transferred to fermenters. Yeast is added and the conversion of sugar to alcohol begins. After fermentation, the resulting “beer” is separated from the remaining stillage. The ethanol is distilled and dehydrated, then blended with about 2 percent denaturant (such as gasoline) to render it undrinkable.

It is then ready for shipment. The stillage is sent through a centrifuge that separates the solids from the solubles. These coproducts eventually become distillers grains and distillers corn oil.

Just as ethanol production starts with farm feedstock, so too does it give back to the farm—especially in the over 35 million metric tons of distillers grains as feed for livestock. Learn more about this on Page 12.



# What Comes from Corn

On average, 1 bushel of corn (56 pounds) processed by a dry mill ethanol biorefinery produces:

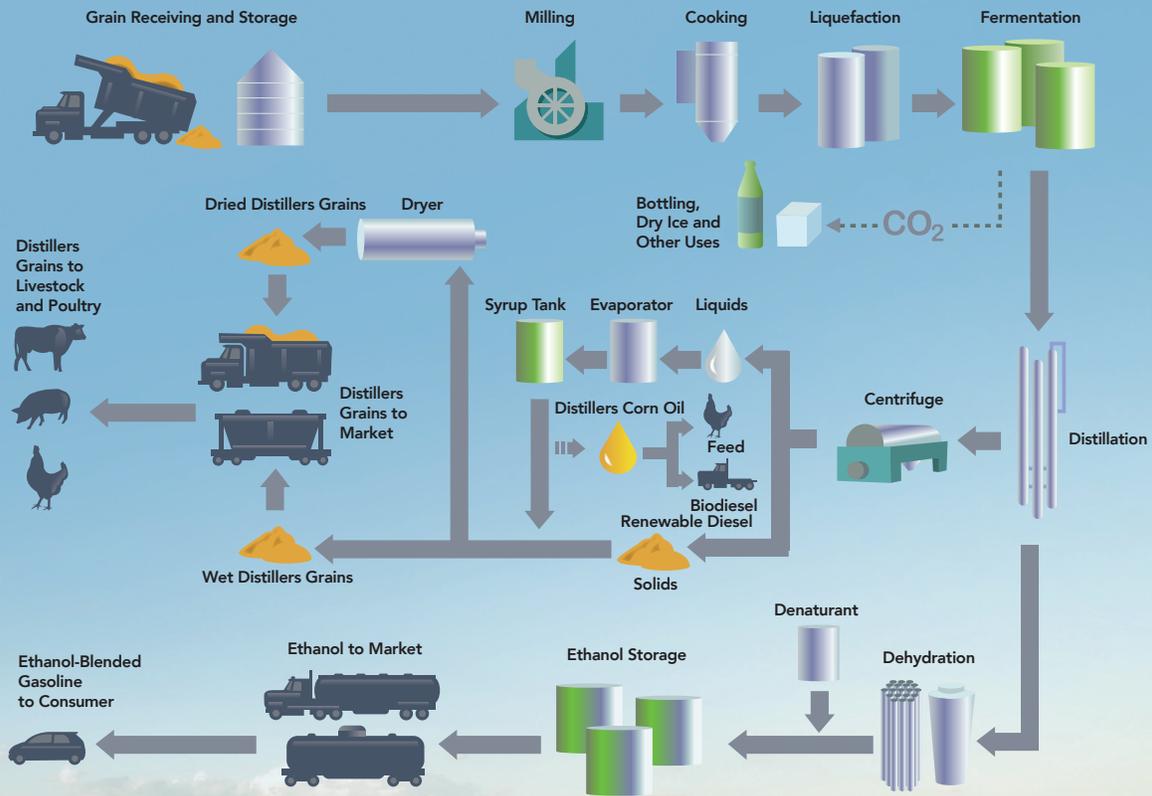
- 2.9 gallons Denatured fuel ethanol
- 14.5 pounds Distillers grains animal feed (10% moisture)
- 0.9 pounds Distillers corn oil
- 16 pounds Captured biogenic carbon dioxide (CO<sub>2</sub>)\*



In 2024, ethanol biorefineries captured roughly 2.7 million tons of CO<sub>2</sub> for dry ice production, bottling, food processing, and other uses.

Source: RFA based on U.S. Dept. of Agriculture data  
 \*Approximately 30 percent of U.S. dry mills capture CO<sub>2</sub> from fermentation

## DRY MILL ETHANOL PROCESS



Source: RFA

## Ethanol's Value-Added Proposition

Based on average prices and product yields in 2024, a typical dry mill ethanol plant was adding approximately \$2.06 of additional value—nearly 50%—to every bushel of corn processed.

Source: RFA based on U.S. Dept. of Agriculture data  
 Estimate based on Jan.-Nov. 2024 data

Corn Cost per Bushel

\$ 4.20



Value of Outputs per Bushel	
Ethanol	\$ 4.71
Distillers Grains	\$ 1.16
Distillers Corn Oil	\$ 0.39
<b>TOTAL</b>	<b>\$ 6.26</b>