

CRUCIAL COPRODUCTS



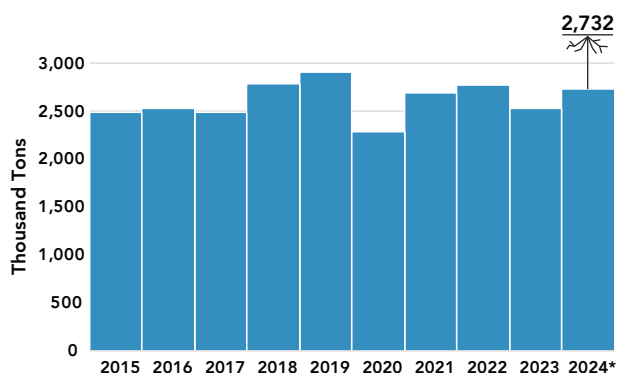
America's ethanol biorefineries deliver more than just high-octane, low-carbon fuel to the world. They also are among the largest global suppliers of high-protein, low-cost animal feed for livestock, poultry, and aquaculture. In 2024, U.S. ethanol producers generated 36 million metric tons (mmt) of distillers grains and corn gluten feed and meal.

In addition, biorefineries produced over 4.5 billion pounds of distillers corn oil (DCO)—a record amount. Ethanol producers continued to pursue optimized DCO production, as demand continued to surge. From its value as a poultry feed ingredient to its use as a major feedstock for renewable diesel, biodiesel, and even sustainable aviation fuel production, DCO demand has never been hotter.

U.S. biorefineries not only satisfy animal nutrition needs domestically, but they also export about one-third of the distillers grains they produce to customers around the world. In 2024, more than 50 countries purchased a cumulative 12.2 mmt of U.S. distillers grains. Half of these exports landed in Southeast and East Asia. Meanwhile, Mexico accounted for 21 percent of total U.S. distillers grains exports shipped, extending the country's title as the top DDGS importer for the eighth consecutive year.

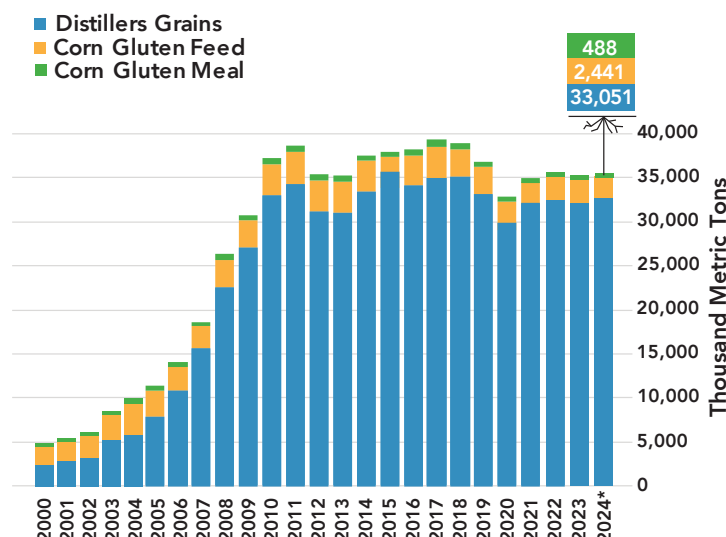
Additionally, biogenic CO₂ produced via fermentation continues to serve as an increasingly valuable coproduct from ethanol biorefineries, with a diversity of uses, such as beverage carbonation, dry ice, wastewater treatment, welding and many other commercial applications. In 2024, ethanol producers across the country turned their focus to emerging opportunities for captured CO₂, ranging from geological sequestration to utilization in new chemical, fuel, and industrial product applications.

ANNUAL BIOGENIC CO₂ CAPTURED AT U.S. ETHANOL FACILITIES



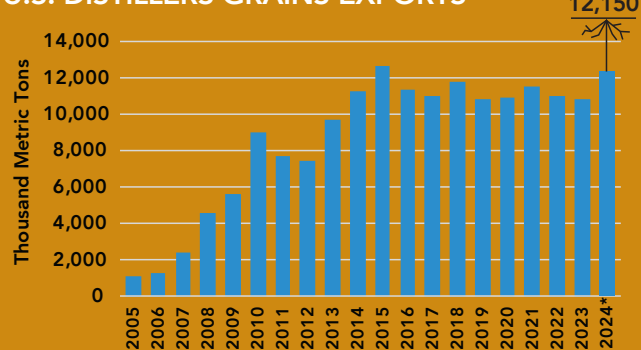
Source: RFA based on U.S. Dept. of Agriculture data
*Projected based on Jan.-Nov. data

U.S. ETHANOL INDUSTRY COPRODUCT ANIMAL FEED OUTPUT



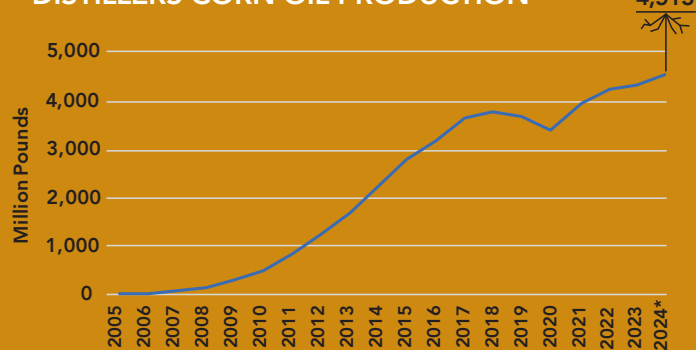
Note: All coproducts converted to 10% moisture basis
Sources: RFA and U.S. Dept. of Agriculture
*Forecast based on Jan.-Oct. 2024 data

U.S. DISTILLERS GRAINS EXPORTS



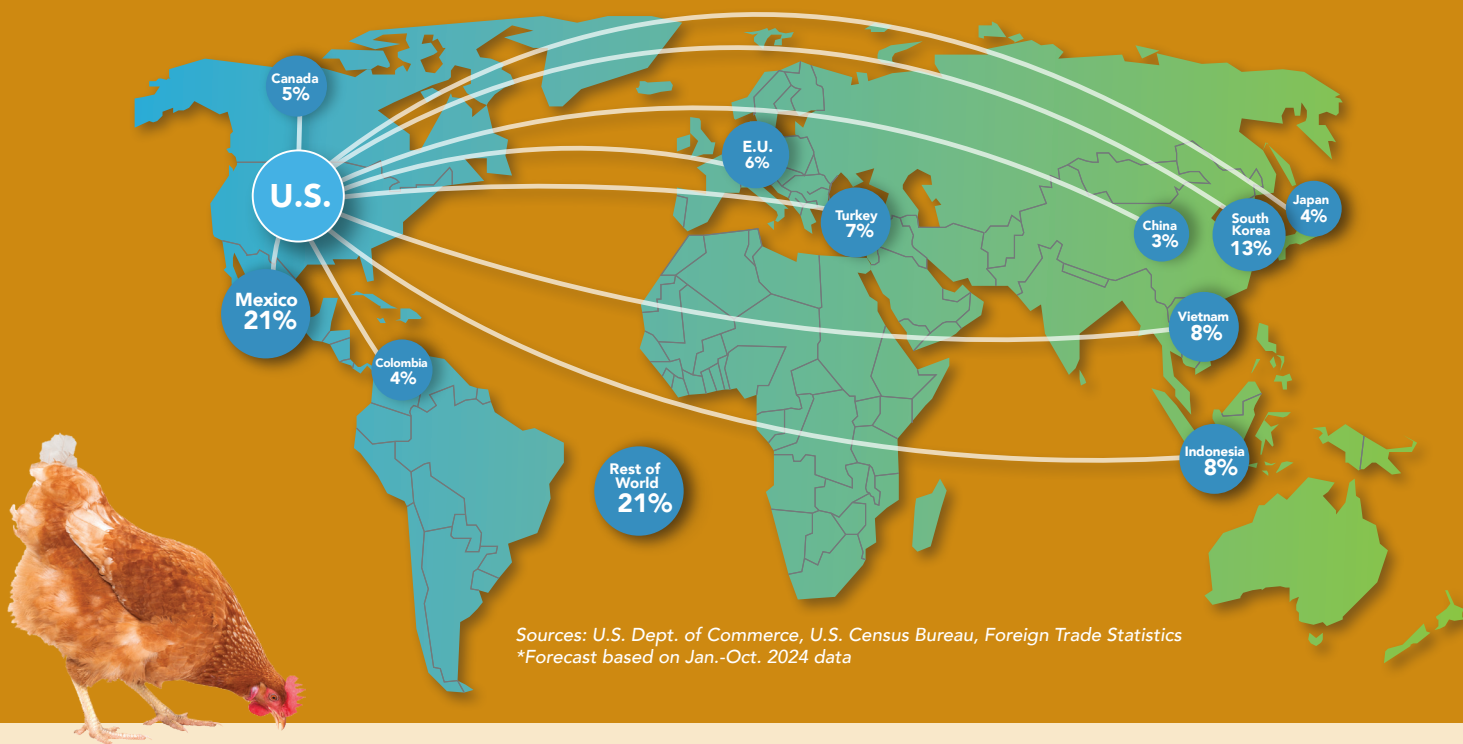
Sources: U.S. Dept. of Commerce, U.S. Census Bureau, Foreign Trade Statistics
*Forecast based on Jan.-Oct. 2024 data

DISTILLERS CORN OIL PRODUCTION



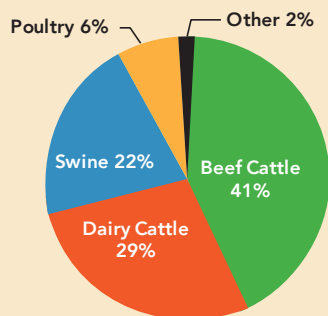
Sources: RFA and U.S. Dept. of Agriculture
*Forecast based on Jan.-Oct. 2024 data

TOP DESTINATIONS FOR U.S. DISTILLERS GRAINS EXPORTS IN 2024



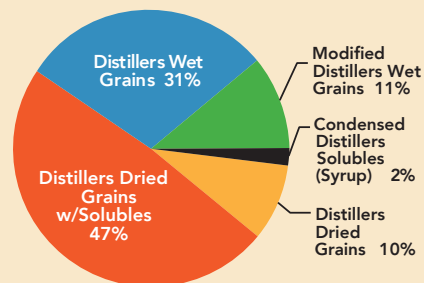
Sources: U.S. Dept. of Commerce, U.S. Census Bureau, Foreign Trade Statistics
*Forecast based on Jan.-Oct. 2024 data

2024 DISTILLERS GRAINS CONSUMPTION BY SPECIES



Source: Distillers grains marketing companies

2024 DISTILLERS GRAINS PRODUCTION BY TYPE, AS-IS BASIS



Source: U.S. Dept. of Agriculture
Based on Jan.-Oct. 2024 data