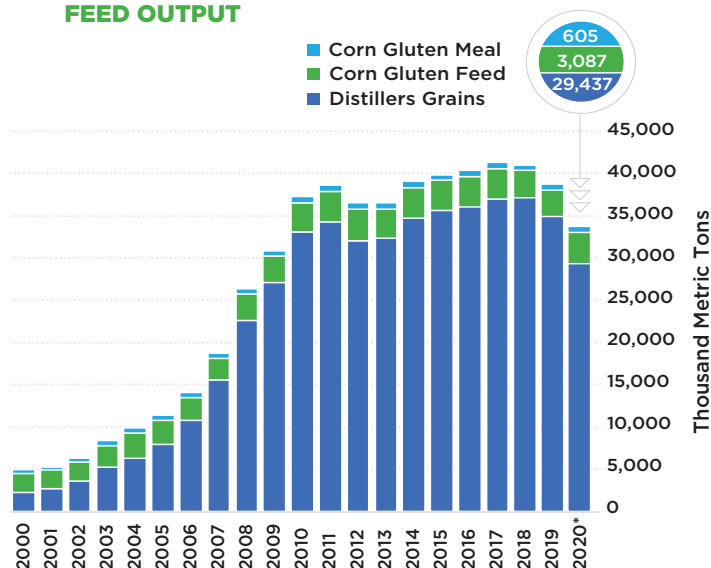


COPRODUCTS ON THE RISE

If there was a silver lining to the COVID-19 pandemic for U.S. ethanol producers, it was that the pandemic brought focus to the fact that the industry makes more than renewable fuel—a lot more.

One of the industry's essential coproducts that typically flies below the radar, biogenic carbon dioxide, got lots of attention in 2020. CO₂ is captured by about a quarter of our nation's ethanol plants and is used for everything from beverage carbonation and meat processing to wastewater treatment and dry ice production. At full capacity, ethanol plants capture 3 to 3.5 million tons of CO₂ annually, or roughly 40 percent of the national supply. With the pandemic came fears that CO₂ needs would not be met. And while production did slip in 2020, the industry continued to be a leading supplier. U.S. ethanol producers captured 2.3 million tons of high-grade biogenic CO₂ for North American food/beverage and industrial markets.

U.S. ETHANOL INDUSTRY COPRODUCT ANIMAL FEED OUTPUT



Source: RFA and U.S. Dept. of Agriculture. Note: All co-products converted to 10% moisture basis *Estimated

Ethanol's Livestock Connection

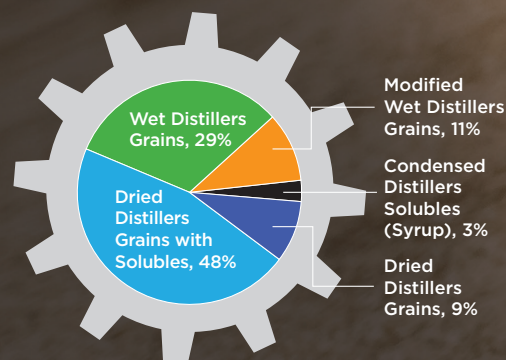
In 2020, U.S. ethanol producers generated 33.1 million metric tons (mmt) of distillers grains, gluten feed, and gluten meal. These bioproducts are valuable protein-rich substitutes for corn, soybean meal, and other ingredients used to feed beef and dairy cows, pigs, chickens, turkeys, fish, and other animals around the world. In addition, biorefineries extracted 3.3 billion pounds of corn distillers oil, a \$940 million market underpinning the production of biodiesel and animal feed.

U.S. DISTILLERS GRAINS EXPORTS



Sources: U.S. Dept. of Commerce, U.S. Census Bureau, Foreign Trade Statistics *2020 estimated based on Jan.-Nov. 2020

DISTILLERS GRAINS PRODUCTION BY TYPE



Source: U.S. Dept. of Agriculture and RFA

TOP DESTINATIONS FOR U.S. DISTILLERS GRAINS EXPORTS IN 2020

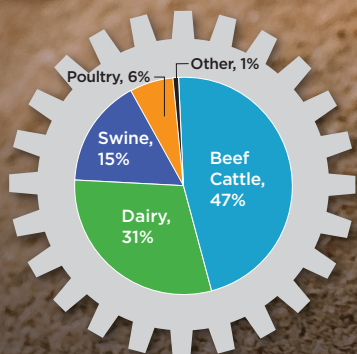
A DIVERSIFIED TRADE PORTFOLIO

U.S. biorefineries satisfied growing domestic animal food needs while also exporting about a third of distillers grains produced. In 2020, more than 50 countries purchased a cumulative 11 mmt of U.S. distillers grains. Half of these exports landed in Southeast and East Asia. Meanwhile nearly 20 percent of total exports were shipped to Mexico, as the country extended its position as our top distillers grains customer for a fourth consecutive year.



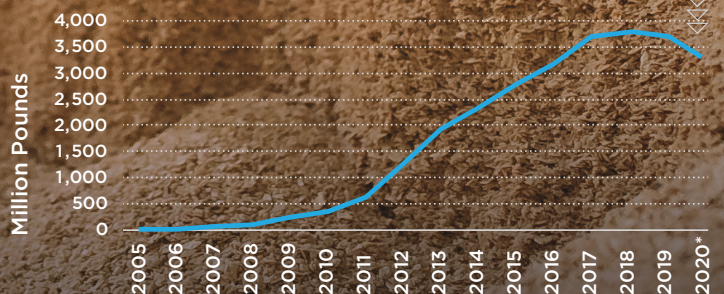
Sources: U.S. Dept. of Commerce, U.S. Census Bureau, Foreign Trade Statistics
*Estimated based on Jan.-Nov. 2020 data

DISTILLERS GRAINS CONSUMPTION BY SPECIES



Source: Distillers grains marketing companies

CORN DISTILLERS OIL PRODUCTION



Sources: U.S. Dept. of Agriculture and RFA *Estimated