



# U.S. Bioenergy Statistics – Documentation

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## Scope

The U.S. Bioenergy Statistics (USBS) is released quarterly (January, April, July, and October). Most data are aggregated to U.S. totals, though some data are presented at other geographic levels. Some price series, for example, are specific to individual cities. Time periods also vary by data series, ranging from 1981–present monthly data (fuel ethanol supply and disappearance) to current year snapshots (e.g., ethanol production capacity by State). In several instances, data are presented on a marketing year (MY) or MY quarter basis. MYs often begin in 1 calendar year (CY) and end in the next—for example, 2010/11 refers to the MY beginning in 2010 and ending in 2011. MYs applicable to this data product are:

- Corn: September 1–August 31
- Canola oil, corn oil, cottonseed oil, soybean oil, and sunflower seed oil: October 1–September 30

Commodities currently covered by the USBS include:

- Biodiesel
- Corn
- Corn gluten feed
- Corn gluten meal

- Distillers' grains
- Fats and vegetable oils: lard, tallow, canola oil, corn oil, cottonseed oil, soybean oil, and sunflower seed oil
- Fuel ethanol and E85 (a fuel mixture consisting of 81–83 percent fuel ethanol)
- Gasoline
- Other alternative fuels (applicable to data where the USBS **table** field is in {12, 13}; see subsections below for additional information)
- Renewable diesel
- Sorghum
- U.S. number 2 diesel

The data provided for the commodities above will vary by commodity and may include categories such as production, consumption, prices, number of fueling stations, etc.

The USBS CSV (comma separated values) file is grouped by “tables,” denoted by a table number and a table name that represent the tables in the Excel Workbook version of the USBS. The table numbers and names differ slightly across the CSV and Excel workbook versions; a mapping of table names between the CSV and Excel workbook version of the USBS is available in [U.S. bioenergy table name mapping.xlsx](#). Currently, the USBS CSV file contains the following “tables”:

1. USBS **table** field = 1, USBS **table\_name** field = “Fuel ethanol supply and disappearance and grain crushings for fuel ethanol by marketing year and quarter”
2. USBS **table** field = 2, USBS **table\_name** field = “Fuel ethanol supply and disappearance and grain crushings for fuel ethanol by calendar year”
3. USBS **table** field = 3, USBS **table\_name** field = “Fuel ethanol supply and disappearance and grain crushings for fuel ethanol by month”
4. USBS **table** field = 4.1, USBS **table\_name** field = “Biodiesel supply and disappearance by soybean oil marketing year”
5. USBS **table** field = 4.2, USBS **table\_name** field = “Biodiesel supply and disappearance by calendar year”
6. USBS **table** field = 4.3, USBS **table\_name** field = “Renewable diesel supply and disappearance by soybean oil marketing year”
7. USBS **table** field = 4.4, USBS **table\_name** field = “Renewable diesel supply and disappearance by calendar year”
8. USBS **table** field = 5, USBS **table\_name** field = “Corn supply, disappearance, and share of total corn used for ethanol”
9. USBS **table** field = 6, USBS **table\_name** field = “Soybean oil supply, disappearance, and share used for biofuel”

10. USBS **table** field = 7, USBS **table\_name** field = “Oils and fats supply and prices”
11. USBS **table** field = 8.1, USBS **table\_name** field = “Distillers grains supply and disappearance”
12. USBS **table** field = 8.2, USBS **table\_name** field = “Corn gluten meal supply and disappearance”
13. USBS **table** field = 8.3, USBS **table\_name** field = “Corn gluten feed supply and disappearance”
14. USBS **table** field = 9, USBS **table\_name** field = “Distillers dried grains price”
15. USBS **table** field = 10, USBS **table\_name** field = “Fuel ethanol production facilities capacity, production, and utilization ratios”
16. USBS **table** field = 11, USBS **table\_name** field = “Fuel ethanol production facilities capacity, by State”
17. USBS **table** field = 12, USBS **table\_name** field = “Biodiesel and renewable diesel production: Number of plants and capacity by State”
18. USBS **table** field = 13, USBS **table\_name** field = “Alternative fuel stations”
19. USBS **table** field = 14, USBS **table\_name** field = “Monthly prices for corn, fuel ethanol, and gasoline”
20. USBS **table** field = 15, USBS **table\_name** field = “Fuel ethanol and finished motor gasoline consumption and fuel ethanol market share”
21. USBS **table** field = 16, USBS **table\_name** field = “Biodiesel and diesel prices”
22. USBS **table** field = 17, USBS **table\_name** field = “Monthly average retail diesel prices”

Unit abbreviations used in this document include:

- Bbl = barrels
- Bu = bushels
- Cwt = hundredweights
- CY = calendar year
- Gal = gallons
- HS = Harmonized System
- L = liters
- Lbs = pounds
- MT = metric tons
- MM = million
- MY = marketing year
- \$ = U.S. dollar
- T = tons

## Methods

The CSV version of the data product consists of 15 fields, described below. When referring to a USBS field name, the text will be **bold-faced** and *italicized*. The USBS currently contains the following fields:

1. **table**: Table number corresponding to table numbers from the Excel Workbook version of the data product.
2. **table\_name**: Table name corresponding to table names from the Excel Workbook version of the data product.
3. **year**: Year associated with the record.
4. **year\_cat**: One of “Calendar” if the **year** field refers to a calendar year or “Marketing” if the **year** field refers to a marketing year. Note that while MYs are often written as, for example, 2021/22, the **year** field will display the 2021/22 MY as 2021.
5. **year\_desc**: Detailed description of what the **year** field represents. For example, may take the value of “Corn marketing year (Sep-Aug)”.
6. **period**: Numeric value representing a month (1–12), a quarter (1–4), or a year (e.g., 2022). For annual data, **period** will take the same value as the **year**.
7. **period\_cat**: Indicates what the **period** field represents. Takes one of the following values: “Calendar year month,” “Calendar year,” “Marketing year month,” “Marketing year quarter,” or “Marketing year.”
8. **period\_desc**: Text description of the **period**. For example, for monthly periods, **period\_desc** will be a 3-character abbreviation for the name of the month.
9. **geographic\_level**: Geographic level at which data are aggregated or collected.
10. **location**: Location corresponding to the **geographic\_level** field. For example, if **geographic\_level** = “Region”, **location** may take a value such as “Midwest” or “Eastern Corn Belt”.
11. **commodity**: Name of the commodity to which the record corresponds, e.g., “Corn” or “Fuel ethanol”.
12. **data\_item**: Brief categorical description of what the **value** field represents. Can be used across multiple tables, e.g., “Price”.
13. **data\_item\_desc**: Provides details in addition to those given by the **data\_item** field, e.g., “Price for edible corn oil”. Not applicable for every record.
14. **units**: Unit of measurement associated with the **value**.
15. **value**: Numeric value for the record.

Conversion factors used in creating the USBS (and variable names used in this document) are:

- *gal\_per\_bbl* = gallons per barrel = 42 gal/bbl
- *lbs\_per\_sorg* = pounds per bushel of sorghum = 56 lbs/bu
- *gal\_per\_liter* = gallons per liter = 0.264172 gal/L

- *lbs\_per\_mt* = pounds per metric ton = 2,204.62 lbs/MT

Abbreviations used within the USBS include: ECB = Eastern Corn Belt, IA = Iowa, IL = Illinois, IN = Indiana, MN = Minnesota, MS = Mississippi, NE = Nebraska, SD = South Dakota, WI = Wisconsin, U.S. = United States, Jan = January, Feb = February, Mar = March, Apr = April, Jun = June, Jul = July, Aug = August, Sep = September, Oct = October, Nov = November, Dec = December, Q1 = 1st quarter, Q2 = 2nd quarter, Q3 = 3rd quarter, Q4 = 4th quarter, and E85 = a fuel mixture consisting of 81–83 percent fuel ethanol.

The methods and data sources vary by table. These methods and sources are detailed in the subsections below.

## Data Sources

With the USBS, the USDA's Economic Research Service (ERS) compiles summary statistics from the following sources:

- U.S. Department of Agriculture (USDA):
  - Agricultural Marketing Service (AMS):
    - [National Weekly Ag Energy Round-Up](#) (NWAER)
    - [National Weekly Ethanol Report](#) (NWER)
  - Foreign Agricultural Service (FAS):
    - [Global Agricultural Trade System](#) (GATS)
  - Economic Research Service (ERS):
    - [Feed Grains Database](#) (FGD)
    - [Oil Crops Yearbook](#) (OCY)
    - [Oil Crops Outlook](#) (OCO)
  - National Agricultural Statistics Service (NASS): [Quick Stats](#) (QS) (additional information: [Understanding Agricultural Statistics](#), [Methodology and Quality Measures](#))
- U.S. Department of Energy (DOE)
  - Energy Information Administration (EIA):
    - [Monthly Energy Review](#) (MER)
    - [U.S. Biodiesel Plant Production Capacity](#)
    - [U.S. Fuel Ethanol Plant Production Capacity](#)
    - [U.S. Renewable Diesel Fuel and Other Biofuels Plant Production Capacity](#)
    - [Open Data](#)
  - Vehicle Technologies Office (VTO): [Alternative Fuels Data Center](#) (AFDC)

- Nebraska Department of Environment and Energy (NDEE): [Ethanol and Unleaded Gasoline Average Rack Prices](#)

Additional details on where the sources are used are provided in the subsections below.

## Tables 1–3

Values where the USBS **table** field is in {1, 2, 3} are constructed using monthly data from MER Table 10.3, FAS GATS, and NASS QS. Descriptions of these sources—and the names used to refer to them in this document—are as follows:

- *MER\_eth\_cons*: Monthly U.S. consumption of fuel ethanol (in 1,000 bbl) obtained from MER Table 10.3.
- *MER\_eth\_end*: Monthly U.S. stocks of fuel ethanol at the end of the month (in 1,000 bbl) obtained from MER Table 10.3.
- *MER\_net\_m*: Monthly U.S. net imports of fuel ethanol (in 1,000 bbl) obtained from MER Table 10.3.
- *MER\_eth\_prod*: Monthly U.S. production of fuel ethanol (in 1,000 bbl) obtained from MER Table 10.3.
- *MER\_eth\_x*: Monthly U.S. exports of fuel ethanol (in 1,000 bbl) obtained from MER Table 10.3.
- *Census\_x1*: Monthly U.S. exports of ethyl alcohol and other spirits, denatured, of any strength (HS code 2207106000) (in L) obtained from FAS GATS.
- *Census\_x2*: Monthly U.S. exports of undenatured ethyl alcohol of an alcoholic strength by volume of 80 percent volume or higher for non-beverage purposes (HS Code 2207200000) (in L) obtained from FAS GATS.
- *NASS\_corn*: Monthly corn consumed in the United States for fuel alcohol production (in bu) obtained from USDA NASS QS.
- *NASS\_sorg*: Monthly sorghum consumed in the United States for fuel alcohol production (in cwt) obtained from USDA NASS QS.

The MER data can be obtained from the MER interactive tables or from EIA’s Open Data tool using the following query parameters:

- API route: “Total Energy”
- Frequency: “Monthly”
- Filter by facet: “MSN”:
  - *MER\_eth\_cons*: “Fuel Ethanol Consumption in Thousand Barrels (ENTCPUS)”
  - *MER\_eth\_end*: “Fuel Ethanol Stocks, End of Period in Thousand Barrels (ENPSPUS)”
  - *MER\_net\_m*: “Fuel Ethanol Net Imports in Thousand Barrels (ENNIPUS)”
  - *MER\_eth\_prod*: “Fuel Ethanol Production in Thousand Barrels (ENPRPUS)”

- *MER\_eth\_x*:
  - API Route:
    - API Route 1: “Petroleum”
    - API Route 2: “Summary”
    - API Route 3: “Supply And Disposition”
  - Frequency: “Monthly”
  - Filter by facet:
    - SERIES: “U.S. Exports of Fuel Ethanol (Thousand Barrels) (M\_EPOOXE\_EEX\_NUS-Z00\_MBBL)”

The FAS GATS data can be retrieved using the following “Standard Query” parameters:

- Data Source: “FAS U.S. Trade”
- Product Type: “Exports”
- Product Groups: “Harmonized (HS-10)”
- Partners: “World Total”
- Products: “22 - Beverages, Spirits And Vinegar-\*”
  - “2207106000 - ETHYL ALCOHOL, U”
  - “2207200000 - ETHYL ALCOHOL &”
- Statistics:
  - Value: “(None)”
  - Quantity: “Quantity”, “FAS Non Converted”
- Dates:
  - Series: “Monthly”
  - Monthly Range: Jan–Dec
  - Year Range: 1989–Present
  - End Month: Most recent available

The NASS QS data can be retrieved using the following query parameters:

- *NASS\_corn*:
  - Commodity: “CORN”
  - Data Item: “CORN, FOR FUEL ALCOHOL - USAGE, MEASURED IN BU”
  - Domain: “TOTAL”
- *NASS\_sorg*:
  - Commodity: “SORGHUM”
  - Data Item: “SORGHUM, FOR FUEL ALCOHOL - USAGE, MEASURED IN CWT”

Data are converted to common units as follows:

- To 1,000 gal:
  - *MER\_eth\_cons*, *MER\_eth\_end*, *MER\_net\_m*, *MER\_eth\_prod*, and *MER\_eth\_x* are multiplied by *gal\_per\_bbl*.
  - *Census\_x1* and *Census\_x2* are multiplied by *gal\_per\_liter* and divided by 1,000.
- To 1,000 bu:
  - *NASS\_corn* is divided by 1,000.
  - *NASS\_sorg*: Values are summed across domain categories for each month-year combination. The resulting sums are multiplied by 100 and divided by *lbs\_per\_sorg* and then divided by 1,000.

The values where the USBS **table** field = 3 are then constructed as described below. Note that for each description, it is implied that the USBS **table** field = 3.

- Values where the USBS **data\_item** field = “Consumption” are set equal to *MER\_eth\_cons*.
- Values where the USBS **data\_item** field = “Production” are set equal to *MER\_eth\_prod*.
- Values where the USBS **data\_item** field = “Ending stocks” are set equal to *MER\_eth\_end*.
- Values where the USBS **data\_item** field = “Beginning stocks” are set equal to the ending stocks from the previous month. For example, the value where the USBS **year** field = 2022, USBS **period\_desc** = “Jan”, and the USBS **data\_item** = “Beginning stocks” is equal to the value where the USBS **year** field = 2021, USBS **period\_desc** = “Dec”, and the USBS **data\_item** = “Ending stocks”.
- Values where the USBS **data\_item** field = “Exports”: For January 1989–December 2009, these values are the monthly sums of *Census\_x1* and *Census\_x2*. From January 2010 onward, the values where the USBS **data\_item** field = “Exports” are set equal to the corresponding monthly values in *MER\_eth\_x*.
- Values where the USBS **data\_item** field = “Imports” are set equal to the monthly values in *MER\_net\_m* plus the corresponding monthly USBS values where the USBS **data\_item** field = “Exports” (described in the previous item).
- Values where the USBS **data\_item** field = “Total supply” are set equal to the sum of the values—from the same month and year—where the USBS **data\_item** field = “Beginning stocks”, the USBS **data\_item** field = “Domestic production”, and the USBS **data\_item** field = “Imports”. For example, the total fuel ethanol supply for January 2022 is the sum of the values where:
  - (1) the USBS **year** field = 2022, the USBS **period\_desc** field = “Jan”, and the USBS **data\_item** field = “Beginning stocks”;
  - (2) the USBS **year** field = 2022, the USBS **period\_desc** field = “Jan”, and the USBS **data\_item** field = “Production”; and
  - (3) the USBS **year** field = 2022, the USBS **period\_desc** field = “Jan”, and the USBS **data\_item** field = “Imports”.



- Values where the USBS **data\_item** field = “Total use” are set equal to the sum of the values— from the same month and year—where the USBS **data\_item** field = “Consumption” and the USBS **data\_item** field = “Exports”. For example, the total fuel ethanol use for January 2022 is the sum of the values where:
  - (1) the USBS **year** field = 2022, the USBS **period\_desc** field = “Jan”, and the USBS **data\_item** field = “Consumption”; and
  - (2) the USBS **year** field = 2022, the USBS **period\_desc** field = “Jan”, and the USBS **data\_item** field = “Exports”.
- Values where the USBS **data\_item** field = “Balance calculation discrepancy”: In theory, for a month, the value where the USBS **data\_item** field = “Total supply” minus the value where the USBS **data\_item** field = “Total use” should equal the value where the USBS **data\_item** field = “Ending stocks”. In most months, the data balances other than some small discrepancies that are likely due to rounding issues. However, some periods—such as January 2022—may have a much larger discrepancy. This data item was added to indicate when and to what extent these discrepancies exist. It is calculated as the monthly value associated with USBS **data\_item** field = “Total supply” minus the value from the same month and year where the USBS **data\_item** field = “Total use” and minus the value from the same month and year where the USBS **data\_item** field = “Ending stocks”. For example, the balance calculation discrepancy for January 2022 is equal to
  - (1) The value where the USBS **year** field = 2022, the USBS **period\_desc** field = “Jan”, and the USBS **data\_item** field = “Total supply” minus
  - (2) The value where the USBS **year** field = 2022, the USBS **period\_desc** field = “Jan”, and the USBS **data\_item** field = “Total use” minus
  - (3) The value where the USBS **year** field = 2022, the USBS **period\_desc** field = “Jan”, and the USBS **data\_item** field = “Ending stocks”.
- Values where the USBS **data\_item** field = “Fuel alcohol use” are set equal to *NASS\_corn* for USBS **commodity** field = “Corn” and to *NASS\_sorg* for USBS **commodity** field = “Sorghum”.

Values where the USBS **table** field = 1 and where the USBS **table** field = 2 are built using the values where the USBS **table** field = 3 and are described in the following subsections.

## Table 1

In each of the descriptions below, it is implied that the USBS **table** field = 1 unless stated otherwise.

- Values where the USBS **data\_item** field = “Ending stocks”:
  - If the USBS **period\_cat** field = “Marketing year quarter”, values are set equal to the ending stocks from the final month of the quarter. For example, the first quarter of the 2020/21 corn MY consists of September, October, and November 2020. As such, the value where the USBS **year** field = 2020, the USBS **period** field = 1, and the

USBS **data\_item** field = “Ending stocks” is set equal to the value associated with the value where the USBS **table** field = 3, the USBS **year** field = 2020, the USBS **period\_desc** field = “Nov”, and the USBS **data\_item** field = “Ending stocks”.

- If the USBS **period\_cat** field = “Marketing year”, values are set equal to the ending stocks from the final month of the corn MY. For example, the final month of the 2020/21 corn MY was August of 2021. As such, the value where the USBS **year** field = 2020 and the USBS **data\_item** field = “Ending stocks” is equal to the value where the USBS **table** field = 3, the USBS **year** field = 2021, the USBS **period\_desc** field = “Aug”, and the USBS **data\_item** field = “Ending stocks”.
- Values where the USBS **data\_item** field = “Beginning stocks”:
  - The value where the USBS **year** field = 2020, the USBS **period\_desc** = “Q1 Sep-Nov”, and the USBS **data\_item** = “Ending stocks”.
  - The value where the USBS **table** field = 3, the USBS **year** field = 2020, the USBS **period\_desc** field = “Nov”, and the USBS **data\_item** field = “Ending stocks”.
  - The value where the USBS **table** field = 3, the USBS **year** field = 2020, the USBS **period\_desc** field = “Dec”, and the USBS **data\_item** field = “Beginning stocks”.
  - The value where the USBS **year** field = 2019, the USBS **period\_desc** field = “Corn marketing year (Sep-Aug)”, and the USBS **data\_item** = “Ending stocks”.
  - The value where the USBS **table** field = 3, the USBS **year** field = 2020, the USBS **period\_desc** field = “Aug”, and the USBS **data\_item** field = “Ending stocks”.
  - The value where the USBS **table** field = 3, the USBS **year** field = 2020, the USBS **period\_desc** field = “Sep”, and the USBS **data\_item** field = “Beginning stocks”.
  - If the USBS **period\_cat** field = “Marketing year quarter”, these values are the sums of the relevant monthly data found for the same USBS **data\_item** field value where the USBS **table** field = 3. For example, the fuel ethanol consumption in the first quarter of the 2020/21 corn MY (i.e., the value where the USBS **year** field = 2020, the USBS **period\_desc** field = “Q1 Sep-Nov”, and the USBS **data\_item** field = “Consumption”) is the sum the values where the USBS **table** field = 3, the USBS **data\_item** field = “Consumption”, the USBS **year** field = 2020, and the USBS **period\_desc** is in {“Sep”, “Oct”, “Nov”}. If in a MY quarter, a USBS **data\_item** field value does not have data for any month, no data is reported for that USBS **data\_item** field value for that MY quarter. Otherwise, missing values for a month are treated as zero for summing.
  - If the USBS **period\_cat** field = “Marketing year”, these values are the sums of the relevant monthly data for the same USBS **data\_item** field value where the USBS **table** field = 3. For example, the 2020/21 MY consumption is the sum of the following values:
    - (1) Values where the USBS **table** field = 3, the USBS **data\_item** field = “Consumption”, the USBS **year** field = 2020, and the USBS **period\_desc** field is in {“Sep”, “Oct”, “Nov”, “Dec”}; and

(2) values where the USBS table **field** = 3, the USBS **data\_item** field = “Consumption”, the USBS **year** field = 2021, and the USBS **period\_desc** is in {“Jan”, “Feb”, “Mar”, “Apr”, “May”, “Jun”, “Jul”, “Aug”}.

If in a MY, a USBS **data\_item** field value does not have data for any month, no data is reported for that USBS **data\_item** field value for that MY. Otherwise, missing values for a month are treated as zero for summing.

- the value where the USBS **year** field = 2021, the USBS **period\_desc** field = “Q1 Sep-Nov”, and the USBS **data\_item** field = “Beginning stocks”,
- the value where the USBS **year** field = 2021, the USBS **period\_desc** field = “Q1 Sep-Nov”, and USBS **data\_item** field = “Production”, and
- the value where the USBS **year** field = 2021, the USBS **period\_desc** field = “Q1 Sep-Nov”, and the USBS **data\_item** field = “Imports”.
- the value where the USBS **year** field = 2021, the USBS **period\_desc** field = “Q1 Sep-Nov”, and the USBS **data\_item** field = “Consumption” and
- the value where the USBS **year** field = 2021, the USBS **period\_desc** field = “Q1 Sep-Nov”, and the USBS **data\_item** field = “Exports”.
- If the USBS **period\_cat** field = “Marketing year quarter”, values are set equal to the ending stocks from the previous quarter. Equivalently, the beginning stocks for a MY quarter can be set equal to the beginning stocks for the first month in the MY quarter or to the ending stocks from the last month in the previous MY quarter. For example, the beginning stocks value for the second quarter of the 2020/21 corn MY (December–February) is equal to each of the following (i.e., the value where the USBS **year** field = 2020, the USBS **period\_desc** = “Q2 Dec-Feb”, and the USBS **data\_item** field = “Beginning stocks”):
- If the USBS **period\_cat** field = “Marketing year”, values are set equal to the ending stocks from the previous MY. Equivalently, the MY beginning stocks can be set equal to the beginning stocks for the first month of the MY (September). For example, the beginning stocks for the 2020/21 corn MY (i.e., the value where the USBS **year** field = 2020, the USBS **period\_desc** = “Corn marketing year (Sep-Aug)”, and the USBS **data\_item** field = “Beginning stocks”) is equal to each of the following:
- Values where the USBS **data\_item** field is in {“Production”, “Imports”, “Consumption”, “Exports”, “Fuel alcohol use”}:
- Values where the USBS **data\_item** = “Total supply” are the sum of beginning stocks, production, and imports for a particular MY quarter or MY. For example, the total supply of fuel ethanol for the first quarter of the 2021/22 MY (i.e., the value where the USBS **year** field = 2021, the USBS **period\_desc** field = “Q1 Sep-Nov”, and the USBS **data\_item** field = “Total supply”) is the sum of the following:
- Values where the USBS **data\_item** = “Total use” are the sum of consumption and exports for a particular MY quarter or MY. For example, the total use of fuel ethanol for the first

quarter of the 2021/22 MY (i.e., the value where the USBS **year** field = 2021, the USBS **period\_desc** field = “Q1 Sep-Nov”, and the USBS **data\_item** field = “Total use”) is the sum of the following:

- USBS **data\_item** = “Balance calculation discrepancy”: In theory, for each MY or MY quarter, the value where the USBS **data\_item** field = “Total supply” minus the value where the USBS **data\_item** field = “Total use” should equal the value where the USBS **data\_item** field = “Ending stocks”. In most MYs and MY quarters, the data balances other than some small discrepancies that are likely due to rounding issues. However, some periods—such as MY 2021/22—may have a much larger discrepancy. This data item was added to indicate when and to what extent these discrepancies exist. The value associated with this data item is calculated as the MY or MY quarter value where the USBS **data\_item** field = “Total supply” minus the values—from the same MY or MY quarter—where the USBS **data\_item** field = “Total use” and the USBS **data\_item** field = “Ending stocks”. For example, the balance calculation discrepancy for MY 2021/22 (i.e., the value where the USBS **year** field = 2021, the USBS **period\_desc** field = 2021, and the USBS **data\_item** field = “Balance calculation discrepancy”) is equal to
  - (1) the value where the USBS **year** field = 2021, the USBS **period\_desc** field = “Corn marketing year (Sep-Aug)”, and the USBS **data\_item** field = “Total supply” minus
  - (2) the value where the USBS **year** field = 2021, the USBS **period\_desc** field = “Corn marketing year (Sep-Aug)”, and the USBS **data\_item** field = “Total use” minus
  - (3) the value where the USBS **year** field = 2021, the USBS **period\_desc** field = “Corn marketing year (Sep-Aug)”, and the USBS **data\_item** field = “Ending stocks”.

## Table 2

In each of the descriptions below, it is implied that the USBS **table** field = 2 unless stated otherwise.

- Values where the USBS **data\_item** field = “Ending stocks” are set equal to the ending stocks from the last month of the CY (December). For example, CY 2021 ending stocks (i.e., the value where the USBS **year** field = 2021 and the USBS **data\_item** = “Ending stocks”) is equal to the value where the USBS **table** field = 3, the USBS **year** field = 2021, the USBS **period\_desc** field = “Dec”, and the USBS **data\_item** field = “Ending stocks”.
- Values where the USBS **data\_item** field = “Beginning stocks” are set equal to the ending stocks from the previous CY or to the ending stocks from the last month of the previous CY. For example, CY 2022 beginning stocks is equal to each of the following:
  - the value where the USBS **year** field = 2021 and the USBS **data\_item** field = “Ending stocks” and
  - the value where the USBS **table** field = 3, the USBS **year** field = 2021, the USBS **period\_desc** field = “Dec”, and the USBS **data\_item** field = “Ending stocks”.

- Values where the USBS **data\_item** field is in {"Production", "Imports", "Consumption", "Exports", "Fuel ethanol use"}: These are the sums of the relevant monthly values where the USBS **table** field = 3. For example, CY 2021 consumption (i.e., the value where the USBS **year** field = 2021 and the USBS **data\_item** field = "Consumption") is the sum of the values where the USBS **table** field = 3, the USBS **year** field = 2021, the USBS **data\_item** field = "Consumption", and the USBS **period\_desc** is in {"Jan", "Feb", "Mar", "Apr", "May", "Jun", "Jul", "Aug", "Sep", "Oct", "Nov", "Dec"}.
- Values where the USBS **data\_item** = "Total supply" are the sum of beginning stocks, production, and imports for a particular CY. For example, CY 2021 total supply of fuel ethanol (i.e., the value where the USBS **year** field = 2021 and the USBS **data\_item** field = "Total supply") is the sum of the following:
  - the value where the USBS **year** field = 2021, the USBS **data\_item** = "Beginning stocks";
  - the value where the USBS **year** field = 2021, the USBS **data\_item** = "Production"; and
  - the value where the USBS **year** field = 2021, the USBS **data\_item** = "Imports".
- Values where the USBS **data\_item** = "Total use" are the sum of consumption and exports for a particular CY. For example, CY 2021 total use of fuel ethanol (i.e., the value where the USBS **year** field = 2021 and the USBS **data\_item** field = "Total use") is the sum of the following:
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = "Consumption" and
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = "Exports".
- Values where the USBS **data\_item** = "Balance calculation discrepancy": In theory, for each CY, the value where the USBS **data\_item** field = "Total supply" minus the value where the USBS **data\_item** field = "Total use" should equal the value where the USBS **data\_item** field = "Ending stocks". In most CYs, the data balances other than some small discrepancies that are likely due to rounding issues. However, some periods—such as CY 2022—may have a much larger discrepancy. This data item was added to indicate when and to what extent these discrepancies exist. It is calculated as the CY value where the USBS **data\_item** field = "Total supply" minus the values—from the same CY—where the USBS **data\_item** field = "Total use" and the USBS **data\_item** field = "Ending stocks". For example, the CY 2021 balance calculation discrepancy (i.e., the value where the USBS **year** field = 2021 and the USBS **data\_item** = "Balance calculation discrepancy") is equal to
  - (1) the value where the USBS **year** field = 2021 and the USBS **data\_item** field = "Total supply" minus
  - (2) the value where the USBS **year** field = 2021 and the USBS **data\_item** field = "Total use" minus
  - (3) the value where the USBS **year** field = 2021 and the USBS **data\_item** field = "Ending stocks".

## Tables 4.1–4.4

Data where the USBS **table** field is 4.1 and 4.2 are based on the monthly data from MER table 10.4a. Data where the USBS **table** field is 4.3 and 4.4 are based primarily on the monthly data from MER table 10.4b. The data sources—along with the series’ names used in this document—that are utilized in constructing the values where the USBS **table** field is in {4.1, 4.2, 4.3, 4.4} are as follows:

- *MER\_bd\_cons*: Monthly U.S. consumption of biodiesel (in 1,000 bbl) obtained from MER Table 10.4a.
- *MER\_bd\_end*: Monthly U.S. end-of-month stocks (in 1,000 bbl) obtained from MER Table 10.4a.
- *MER\_bd\_prod*: Monthly U.S. production of biodiesel (in 1,000 bbl) obtained from MER Table 10.4a.
- *MER\_bd\_m*: Monthly U.S. imports of biodiesel (in 1,000 bbl) obtained from MER Table 10.4a.
- *MER\_bd\_x*: Monthly U.S. exports of biodiesel (in 1,000 bbl) obtained from MER Table 10.4a.
- *MER\_rd\_cons*: Monthly U.S. consumption of renewable diesel (in 1,000 bbl) obtained from MER Table 10.4b.
- *MER\_rd\_end*: Monthly U.S. end-of-stocks of renewable diesel (in 1,000 bbl) obtained from MER Table 10.4b.
- *MER\_rd\_prod*: Monthly U.S. production of renewable diesel (in 1,000 bbl) obtained from MER Table 10.4b.
- *MER\_rd\_m*: Monthly U.S. imports of renewable diesel (in 1,000 bbl) obtained from MER Table 10.4b.
- *EIA\_rd\_x*: Monthly U.S. exports of renewable diesel (in 1,000 bbl) obtained from EIA.

The MER data (all series except *EIA\_rd\_x*) can be retrieved from EIA’s Open Data tool, using the following query parameters:

- API route: “Total Energy”
- Frequency: “Monthly”
- Filter by facet: “MSN”:
  - *MER\_bd\_cons*: “Biodiesel Consumption in Thousand Barrels (BDTCPUS)”
  - *MER\_bd\_end*: “Biodiesel Stocks, End of Period in Thousand Barrels (BDPSPUS)”
  - *MER\_bd\_prod*: “Biodiesel Production in Thousand Barrels (BDPRPUS)”
  - *MER\_bd\_m*: “Biodiesel Imports in Thousand Barrels (BDIMPUS)”
  - *MER\_bd\_x*: “Biodiesel Exports in Thousand Barrels (BDEXPUS)”
  - *MER\_rd\_cons*: “Renewable Diesel Fuel Consumption in Thousand Barrels (B1TCPUS)”
  - *MER\_rd\_end*: “Renewable Diesel Fuel Stocks in Thousand Barrels (B1PSPUS)”
  - *MER\_rd\_prod*: “Renewable Diesel Fuel Production in Thousand Barrels (B1PRPUS)”
  - *MER\_rd\_m*: “Renewable Diesel Fuel Imports in Thousand Barrels (B1IMPUS)”

MER table 10.4b does not include exports of renewable diesel. As such, exports of renewable diesel (*EIA\_rd\_x*) are obtained via a separate EIA series, which can be retrieved from EIA's Open Data tool using the following query parameters:

- API route:
  - Route 1: "Petroleum"
  - Route 2: "Impots/Exports And Movements"
  - Route 3: "Exports"
- Frequency: "Monthly"
- Filter by facet:
  - Series: "U.S. Exports of Renewable Diesel Fuel (Thousand Barrels) (M\_EPOORDO\_EEX\_NUS-Z00\_MBBL)"

All data are converted to units of 1,000 gallons by multiplying by *gal\_per\_bbl*. Further details on the construction of the values presented in the USBS are presented in the subsections below.

## Table 4.1

Values where the USBS **table** field = 4.1 are constructed as described below. In each of the descriptions below, it is implied that the USBS **table** field = 4.1.

- Values where the USBS **data\_item** field is in {"Consumption", "Exports", "Imports", "Production"} are the sums of the monthly values—across the months in the soybean oil MY—from the corresponding MER series presented previously: *MER\_bd\_cons*, *MER\_bd\_x*, *MER\_bd\_m*, and *MER\_bd\_prod*. For example, the value where the USBS **data\_item** field = "Production" and the USBS **year** field = 2020 (biodiesel production in the 2020/21 soybean oil MY) is the sum of the *MER\_bd\_prod* values corresponding to October 2020 through September 2021.
- Values where the USBS **data\_item** field = "Ending stocks" are set equal to the *MER\_bd\_end* value for the last month of the soybean oil MY. For example, the value where the USBS **data\_item** field = "Ending stocks" and the USBS **year** field = 2020 (the 2020/21 soybean oil MY biodiesel ending stocks) is the *MER\_bd\_end* value corresponding to September 2021.
- Values where the USBS **data\_item** field = "Beginning stocks" are set equal to the ending stocks from the previous MY. For example, the value where the USBS **data\_item** = "Beginning stocks" and the USBS **year** field = 2022 (the 2022/23 soybean oil MY biodiesel beginning stocks) is equal to the value where the USBS **data\_item** = "Ending stocks" and the USBS **year** field = 2021.
- Values where the USBS **data\_item** = "Total supply" are calculated as the sum of the values—from the same MY—where the USBS **data\_item** field = "Beginning stocks", where the

USBS **data\_item** field = “Production”, and where the USBS **data\_item** field = “Imports”. NA values are treated as zero. For example, the value where the USBS **data\_item** = “Total supply” and the USBS **year** field = 2021 (total supply of biodiesel for the 2021/22 soybean oil MY) is calculated as the sum of the following values:

- the value where the USBS **year** field = 2021, and the USBS **data\_item** field = “Beginning stocks”;
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = “Production”; and
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = “Imports”.
- Values where the USBS **data\_item** = “Total use” are calculated as the sum of the values—from the same MY—where the USBS **data\_item** field = “Consumption” and where the USBS **data\_item** field = “Exports”. NA values are treated as zero. For example, the value where the USBS **data\_item** = “Total use” and the USBS **year** field = 2021 (total use of biodiesel for the 2021/22 soybean oil MY) is calculated as the sum of the following values:
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = “Consumption” and
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = “Exports”.
- Values where the USBS **data\_item** = “Balance calculation discrepancy”: In theory, for each MY, the value where the USBS **data\_item** field = “Total supply” minus the value where the USBS **data\_item** field = “Total use” should equal the value where the USBS **data\_item** field = “Ending stocks”. In most MYs, the data balances other than some small discrepancies that are likely due to rounding issues. However, some periods may have a much larger discrepancy. This data item was added to indicate when and to what extent these discrepancies exist. It is calculated as the values where the USBS **data\_item** field = “Total supply” minus the values—from the same MY—where the USBS **data\_item** field = “Total use” and the USBS **data\_item** field = “Ending stocks”. For example, the balance calculation discrepancy for MY 2021/22 is equal to
  - (1) the value where the USBS **year** field = 2021 and the USBS **data\_item** field = “Total supply” minus
  - (2) the value where the USBS **year** field = 2021 and the USBS **data\_item** field = “Total use” minus
  - (3) the value where the USBS **year** field = 2021 and the USBS **data\_item** field = “Ending stocks”.

## Table 4.2

Values where the USBS **table** field = 4.2 are constructed as described below. In each of the descriptions below, it is implied that the USBS **table** field = 4.2.



- Values where the USBS **data\_item** field is in {"Consumption", "Exports", "Imports", "Production"} are the sums of the monthly values—across the CY months—from the corresponding MER series presented above: *MER\_bd\_cons*, *MER\_bd\_x*, *MER\_bd\_m*, and *MER\_bd\_prod*. For example, the value where the USBS **data\_item** field = "Production" and the USBS **year** field = 2020 (CY 2020 biodiesel production) is the sum of the *MER\_bd\_prod* values corresponding to January 2020 through December 2020.
- Values where the USBS **data\_item** field = "Ending stocks" are set equal to the *MER\_bd\_end* value for the last month of the CY. For example, the value where the USBS **data\_item** field = "Ending stocks" and the USBS **year** field = 2020 (CY 2020 biodiesel ending stocks) is the *MER\_bd\_end* value corresponding to December 2020.
- Values where the USBS **data\_item** field = "Beginning stocks" are set equal to the ending stocks from the previous CY. For example, the value where the USBS **data\_item** = "Beginning stocks" and the USBS **year** field = 2022 (CY 2022 biodiesel beginning stocks) is equal to the value where the USBS **data\_item** = "Ending stocks" and the USBS **year** field = 2021.
- Values where the USBS **data\_item** = "Total supply" are calculated as the sum of the values—from the same CY—where the USBS **data\_item** field = "Beginning stocks", where the USBS **data\_item** field = "Production", and where the USBS **data\_item** field = "Imports". NA values are treated as zero. For example, the value where the USBS **data\_item** = "Total supply" and the USBS **year** field = 2021 (CY 2021 total supply of biodiesel) is calculated as the sum of the following values:
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = "Beginning stocks";
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = "Production"; and
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = "Imports".
- Values where the USBS **data\_item** = "Total use" are calculated as the sum of the values—from the same CY—where the USBS **data\_item** field = "Consumption" and where the USBS **data\_item** field = "Exports". NA values are treated as zero. For example, the value where the USBS **data\_item** = "Total use" and the USBS **year** field = 2021 (CY 2021 total use of biodiesel) is calculated as the sum of the following values:
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = "Consumption" and
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = "Exports".
- Values where the USBS **data\_item** = "Balance calculation discrepancy": In theory, for each CY, the value where the USBS **data\_item** field = "Total supply" minus the value where the USBS **data\_item** field = "Total use" should equal the value where the USBS **data\_item** field = "Ending stocks". In most CYs, the data balances other than some small discrepancies that are likely due to rounding issues. However, some periods may have a much larger discrepancy. This data item was added to indicate when and to what extent these discrepancies exist. It is

calculated as the values where the USBS **data\_item** field = “Total supply” minus the values— from the same CY—where the USBS **data\_item** field = “Total use” and the USBS **data\_item** field = “Ending stocks”. For example, the balance calculation discrepancy for CY 2021 is equal to

- (1) the value where the USBS **year** field = 2021 and the USBS **data\_item** field = “Total supply” minus
- (2) the value where the USBS **year** field = 2021 and the USBS **data\_item** field = “Total use” minus
- (3) the value where the USBS **year** field = 2021 and the USBS **data\_item** field = “Ending stocks”.

## Table 4.3

Values where the USBS **table** field = 4.3 are constructed as described below. In each of the descriptions below, it is implied that the USBS **table** field = 4.3 unless stated otherwise.

- Values where the USBS **data\_item** field is in {“Consumption”, “Exports”, “Imports”, “Production”} are the sums of the monthly values—across the months in the soybean oil MY—from the corresponding MER or EIA series presented above: *MER\_rd\_cons*, *EIA\_rd\_x*, *MER\_rd\_m*, and *MER\_rd\_prod*. For example, the value where the USBS **data\_item** field = “Production” and the USBS **year** field = 2020 (renewable diesel production in the 2020/21 soybean oil MY) is the sum of the *MER\_rd\_prod* values corresponding to October 2020 through September 2021.
- Values where the USBS **data\_item** field = “Ending stocks” are set equal to the *MER\_rd\_end* value for the last month of the soybean oil MY. For example, the value where the USBS **data\_item** field = “Ending stocks” and the USBS **year** field = 2020 (the 2020/21 soybean oil MY renewable diesel ending stocks) is the *MER\_rd\_end* value corresponding to September 2021.
- Values where the USBS **data\_item** field = “Beginning stocks” are set equal to the ending stocks from the previous MY. For example, the value where the USBS **data\_item** = “Beginning stocks” and the USBS **year** field = 2022 (the 2022/23 soybean oil MY renewable diesel beginning stocks) is equal to the value where the USBS **data\_item** = “Ending stocks” and the USBS **year** field = 2021.
- Values where the USBS **data\_item** = “Total supply” are calculated as the sum of the values— from the same MY—where the USBS **data\_item** field = “Beginning stocks”, where the USBS **data\_item** field = “Production”, and where the USBS **data\_item** field = “Imports”. NA values are treated as zero. For example, the value where the USBS **data\_item** = “Total supply” and the USBS **year** field = 2021 (total supply of renewable diesel for the 2021/22 soybean oil MY) is calculated as the sum of the following values:

- the value where the USBS **year** field = 2021, and the USBS **data\_item** field = “Beginning stocks”;
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = “Production”; and
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = “Imports”.
- Values where the USBS **data\_item** = “Total use” are calculated as the sum of the values—from the same MY—where the USBS **data\_item** field = “Consumption” and where the USBS **data\_item** field = “Exports”. NA values are treated as zero. For example, the value where the USBS **data\_item** = “Total use” and the USBS **year** field = 2021 (total use of renewable diesel for the 2021/22 soybean oil MY) is calculated as the sum of the following values:
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = “Consumption” and
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = “Exports”.
- Values where the USBS **data\_item** = “Balance calculation discrepancy”: In theory, for each MY, the value where the USBS **data\_item** field = “Total supply” minus the value where the USBS **data\_item** field = “Total use” should equal the value where the USBS **data\_item** field = “Ending stocks”. In most MYs, the data balances other than some small discrepancies that are likely due to rounding issues. However, some periods may have a much larger discrepancy. This data item was added to indicate when and to what extent these discrepancies exist. It is calculated as the MY values where the USBS **data\_item** field = “Total supply” minus the values—from the same MY—where the USBS **data\_item** field = “Total use” and the USBS **data\_item** field = “Ending stocks”. For example, the balance calculation discrepancy for MY 2021/22 is equal to
  - (1) the value where the USBS **year** field = 2021 and the USBS **data\_item** field = “Total supply” minus
  - (2) the value where the USBS **year** field = 2021 and the USBS **data\_item** field = “Total use” minus
  - (3) the value where the USBS **year** field = 2021 and the USBS **data\_item** field = “Ending stocks”.

## Table 4.4

Values where the USBS **table** field = 4.4 are constructed as described below. In each of the descriptions below, it is implied that the USBS **table** field = 4.4.

- Values where the USBS **data\_item** field is in {“Consumption”, “Exports”, “Imports”, “Production”} are the sums of the monthly values—across the CY months—from the corresponding MER or EIA series presented above: *MER\_rd\_cons*, *EIA\_rd\_x*, *MER\_rd\_m*, and *MER\_rd\_prod*. For example, the value where the USBS **data\_item** field = “Production” and

the USBS **year** field = 2020 (CY 2020 renewable diesel production) is the sum of the *MER\_rd\_prod* values corresponding to January 2020 through December 2020.

- Values where the USBS **data\_item** field = “Ending stocks” are set equal to the *MER\_rd\_end* value for the last month of the CY. For example, the value where the USBS **data\_item** field = “Ending stocks” and the USBS **year** field = 2020 (CY 2020 renewable diesel ending stocks) is the *MER\_rd\_end* value corresponding to December 2020.
- Values where the USBS **data\_item** field = “Beginning stocks” are set equal to the ending stocks from the previous CY. For example, the value where the USBS **data\_item** = “Beginning stocks” and the USBS **year** field = 2022 (CY 2022 renewable diesel beginning stocks) is equal to the value where the USBS **data\_item** = “Ending stocks” and the USBS **year** field = 2021.
- Values where the USBS **data\_item** = “Total supply” are calculated as the sum of the values— from the same CY—where the USBS **data\_item** field = “Beginning stocks”, where the USBS **data\_item** field = “Production”, and where the USBS **data\_item** field = “Imports”. NA values are treated as zero. For example, the value where the USBS **data\_item** = “Total supply” and the USBS **year** field = 2021 (CY 2021 total supply of renewable diesel) is calculated as the sum of the following values:
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = “Beginning stocks”;
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = “Production”; and
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = “Imports”.
- Values where the USBS **data\_item** = “Total use” are calculated as the sum of the values—from the same CY—where the USBS **data\_item** field = “Consumption” and where the USBS **data\_item** field = “Exports”. NA values are treated as zero. For example, the value where the USBS **data\_item** = “Total use” and the USBS **year** field = 2021 (CY 2021 total use of renewable diesel) is calculated as the sum of the following values:
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = “Consumption” and
  - the value where the USBS **year** field = 2021, and the USBS **data\_item** field = “Exports”.
- Values where the USBS **data\_item** = “Balance calculation discrepancy”: In theory, for each CY, the value where the USBS **data\_item** field = “Total supply” minus the value where the USBS **data\_item** field = “Total use” should equal the value where the USBS **data\_item** field = “Ending stocks”. In most CYs, the data balances other than some small discrepancies that are likely due to rounding issues. However, some periods may have a much larger discrepancy. This data item was added to indicate when and to what extent these discrepancies exist. It is calculated as the values where the USBS **data\_item** field = “Total supply” minus the values—from the same CY—where the USBS **data\_item** field = “Total use” and the USBS **data\_item** field = “Ending stocks”. For example, the balance calculation discrepancy for CY 2021 is equal to

- (1) the value where the USBS **year** field = 2021 and the USBS **data\_item** field = “Total supply” minus
- (2) the value where the USBS **year** field = 2021 and the USBS **data\_item** field = “Total use” minus
- (3) the value where the USBS **year** field = 2021 and the USBS **data\_item** field = “Ending stocks”.

## Table 5

Values where the USBS **table** field = 5 are constructed using data from the ERS FGD. Five of the **data\_item** categories associated with this table are pulled directly from the FGD and can be retrieved using the following FGD query settings:

- Values where the USBS **data\_item** field = “Exports”:
  - FGD “Group (Commodity or Data Type)” field = “Corn”
  - FGD “Data Attribute” field = “Exports, market year”
  - FGD “Geography” field = “United States”
- Values where the USBS **data\_item** field = “Feed use”:
  - FGD “Group (Commodity or Data Type)” field = “Corn”
  - FGD “Data Attribute” field = “Feed”
  - FGD “Geography” field = “United States”
- Values where the USBS **data\_item** field = “Fuel alcohol use”:
  - FGD “Group (Commodity or Data Type)” field = “Corn”
  - FGD “Data Attribute” field = “Alcohol for fuel use”
  - FGD “Geography” field = “United States”
- Values where the USBS **data\_item** field = “Total supply”:
  - FGD “Group (Commodity or Data Type)” field = “Corn”
  - FGD “Data Attribute” field = “Total supply”
  - FGD “Geography” field = “United States”
- Values where the USBS **data\_item** field = “Total use”:
  - FGD “Group (Commodity or Data Type)” field = “Corn”
  - FGD “Data Attribute” field = “Total use”
  - FGD “Geography” field = “United States”

An additional FGD series is utilized in constructing the USBS values and can be retrieved from the FGD using the following query settings:

- FGD “Group (Commodity or Data Type)” field = “Corn”

- FGD “Data Attribute” field = “Food, seed, and industrial use”
- FGD “Geography” field = “United States”

Note that the FGD contains more fields than those listed above, but in the current version of the FGD, many of these other fields will auto-populate based on the selections provided above. The user will still need to select a frequency (annual or quarterly) and a year (or years).

The remaining USBS **data\_item** field categories where the USBS **table** field = 5 are constructed as follows:

- USBS **data\_item** = “Food, seed, and industrial use (excluding ethanol)”: Calculated as the “Food, seed, and industrial use” series from the FGD minus the value—from the same MY or MY quarter—where the USBS **data\_item** field = “Fuel alcohol use”.
- USBS **data\_item** = “Fuel alcohol share of total use” is calculated as 100 times the value where the USBS **data\_item** field = “Fuel alcohol use” divided by the value—from the same MY or MY quarter—where the USBS **data\_item** field = “Total use”.

## Table 6

The historical data—the data that exclude the current MY and the 2 previous MYs—where the USBS **table** field = 6 can be found in “Table 5—Soybean oil: U.S. supply, disappearance, and price” of the OCY. The USBS values are mapped to the OCY data as follows:

- The USBS values where the USBS **data\_item** field = “Beginning stocks” are the data in the “Supply”: “Beginning” stocks OCY column.
- The USBS values where the USBS **data\_item** field = “Biofuel use” are the data in the “Disappearance”: “Domestic”: “Biofuel” OCY column.
- The USBS values where the USBS **data\_item** field = “Ending stocks” are the data in the “Ending stocks” OCY column.
- The USBS values where the USBS **data\_item** field = “Exports” are the data in the “Disappearance”: “Exports” OCY column.
- The USBS values where the USBS **data\_item** field = “Production” are the data in the “Supply”: “Production” OCY column.
- The USBS values where the USBS **data\_item** field = “Total supply” are the data in the “Supply”: “Total” OCY column.
- The USBS values where the USBS **data\_item** field = “Total use” are the data in the “Disappearance”: “Total” OCY column.

The remaining USBS values are constructed as follows:

- Values where the USBS **data\_item** field = “Food, feed, and other industrial use (excluding biofuel)” are calculated as the values in the “Disappearance: Domestic: Total” OCY column minus the values from the same MY where the USBS **data\_item** field = “Biofuel use” (i.e., minus the OCY values in the “Disappearance: Domestic: Biofuel” column).
- “Biofuel share of total use” is calculated as 100 times the values where the USBS **data\_item** field = “Biofuel use” divided by the values—from the same MY—where the USBS **data\_item** field = “Total use”.

The USBS data are pulled from data housed on ERS servers, not from the OCY published online. As such, small discrepancies may exist due to rounding.

The OCY is updated annually, whereas the data for recent MYs may be updated monthly in conjunction with the monthly releases of USDA’s *World Agricultural Supply and Demand Estimates* reports. Thus, for more recent MYs, USBS data—except for the values where the USBS **data\_item** field = “Biofuel share of total use”—can be found in “Table 3—Soybean oil: U.S. supply and disappearance” of the Oil Crops Outlook Tables (OCOT) published with the monthly release of the ERS OCO report. The USBS values are mapped to the OCOT data as follows:

- The USBS values where the USBS **data\_item** field = “Beginning stocks” are the data in the “Supply”: “Beginning stocks” OCOT column.
- The USBS values where the USBS **data\_item** field = “Biofuel use” are the data in the “Disappearance”: “Domestic”: “Biofuel” OCOT column.
- The USBS values where the USBS **data\_item** field = “Ending stocks” are the data in the “Ending stocks” OCOT column.
- The USBS values where the USBS **data\_item** field = “Exports” are the data in the “Disappearance”: “Exports” OCOT column.
- The USBS values where the USBS **data\_item** field = “Food, feed, and other industrial use (excluding biofuel)” are the data in the “Disappearance”: “Domestic”: “Food & other” OCOT column.
- The USBS values where the USBS **data\_item** field = “Imports” are the data in the “Supply”: “Imports” OCOT column.
- The USBS values where the USBS **data\_item** field = “Production” are the data in the “Supply”: “Production” OCOT column.
- The USBS values where the USBS **data\_item** field = “Total supply” are the data in the “Supply”: “Total” OCOT column.
- The USBS values where the USBS **data\_item** field = “Total use” are the data in the “Disappearance”: “Total” OCOT column.

The USBS values where the USBS **data\_item** field = “Biofuel share of total use” are calculated in the same manner as with the OCY data.

## Table 7

Data where the USBS **table** field = 7 are obtained from the OCY. Historically—through the January 2023 release—this table presented data for canola oil, corn oil, cottonseed oil, lard, peanut oil, soybean oil, sunflower oil, and tallow. Beginning with the April 2023 release, peanut oil is no longer reported because it is no longer included in the OCY. Additionally, beginning with the April 2023 release, two prices are included for corn oil: an edible corn oil price and a non-edible corn oil price. The USBS values are mapped to the OCY data as follows:

- Values where the USBS **commodity** field = “Canola oil” are from OCY table 26 “Canola oil: U.S. supply, disappearance, and price”:
  - USBS values where the USBS **data\_item** field = “Price” are found in the “Price” column
  - USBS values where the USBS **data\_item** field = “Total supply” are found in the “Supply”: “Total” column.
- Values where the USBS **commodity** field = “Corn oil” are from OCY table 33 “Corn oil: U.S. supply, disappearance, and price”:
  - USBS values where the USBS **data\_item\_desc** field = “Price for edible corn oil” are found in the “Price”: “Edible” column
  - USBS values where the USBS **data\_item\_desc** field = “Price for inedible corn oil” are found in the “Price”: “Inedible distillers” column
  - USBS values where the USBS **data\_item** field = “Total supply” are found in the “Supply”: “Total” column.
- Values where the USBS **commodity** field = “Cottonseed oil” are from OCY table 20 “Cottonseed oil: U.S. supply, disappearance, and price”:
  - USBS values where the USBS **data\_item** field = “Price” are found in the “Price” column
  - USBS values where the USBS **data\_item** field = “Total supply” are found in the “Supply”: “Total” column.
- Values where the USBS **commodity** field = “Soybean oil” are from OCY table 5 “Soybean oil: U.S. supply, disappearance, and price”:
  - USBS values where the USBS **data\_item** field = “Price” are found in the “Price” column
  - USBS values where the USBS **data\_item** field = “Total supply” are found in the “Supply”: “Total” column.
- Values where the USBS **commodity** field = “Sunflower seed oil” are from OCY table 24 “Sunflowerseed oil: U.S. supply, disappearance, and price”:
  - USBS values where the USBS **data\_item** field = “Price” are found in the “Price” column
  - USBS values where the USBS **data\_item** field = “Total supply” are found in the “Supply”: “Total” column.
- Values where the USBS **commodity** field = “Lard” are from OCY table 35 “Lard: U.S. supply, disappearance, and price”:



- USBS values where the USBS **data\_item** field = “Price” are found in the “Price” column
- USBS values where the USBS **data\_item** field = “Total supply” are found in the “Supply”: “Total” column.
- Values where the USBS **commodity** field = “Tallow” are from OCY table 36 “Edible tallow: U.S. supply, disappearance, and price”:
  - USBS values where the USBS **data\_item** field = “Price” are found in the “Price” column
  - USBS values where the USBS **data\_item** field = “Total supply” are found in the “Supply”: “Total” column.

Note that both tables 6 and 7 include total supply of soybean oil. Theoretically, these values should be the same. However, small differences exist because the data in table 6 come from ERS servers while the data in table 7 come from the OCY. Additionally, the OCY is updated annually, whereas the data for recent MYs may be updated monthly in conjunction with the monthly releases of USDA’s *World Agricultural Supply and Demand Estimates* reports. Thus, for more recent MYs, USBS price data—for some commodities—in table 7 are from the OCOT.

## Tables 8.1–8.3

Data where the USBS **table** field is in {8.1, 8.2, 8.3} provide market information for the co-products associated with the ethanol production process. These data provide supply and use information for distillers’ grains (**table** = 8.1), corn gluten meal (**table** = 8.2), and corn gluten feed (**table** = 8.3). Data sources for these tables include NASS QS, the USCB trade data, and the ERS FGD. Additionally, conversion factors and yields used in construction of this data—along with the names used in this documentation—include the following:

- *dry\_bev* = Assumed share of beverage alcohol produced at dry mills = 0.0.
- *dry\_ind* = Assumed share of industrial alcohol produced at dry mills = 0.2.
- *corn\_dg* = Assumed distillers’ grains per bushel of corn used in fuel alcohol production = 17 lbs/bu.
- *sorg\_dg* = Assumed distillers’ grains per bushel of sorghum used in fuel alcohol production = 17 lbs/bu.
- *cgf\_bu* = Assumed corn gluten feed per bushel of corn used in the production of high-fructose corn syrup (HFCS), glucose, dextrose, and starch = 13.5 lbs/bu.
- *cgm\_bu* = Assumed corn gluten meal per bushel of corn used in the production of HFCS, glucose, dextrose, and starch = 2.65 lbs/bu.

The raw data series—along with the names used in this documentation—are as follows:

- *corn4Beverage*: Monthly corn used in the production of beverage alcohol in the United States (in bu) obtained from USDA NASS QS.

- *corn4IndAlc*: Monthly corn used in the production of industrial alcohol in the United States (in bu) obtained from USDA NASS QS.
- *dryCorn4Fuel*: Monthly corn used at dry mill production facilities to produce fuel alcohol in the United States (in bu) obtained from USDA NASS QS.
- *wetCorn4Fuel*: Monthly corn used at wet mill production facilities to produce fuel alcohol in the United States (in bu) obtained from USDA NASS QS.
- *sorg4Fuel*: Monthly sorghum used in the production of fuel alcohol in the United States (in cwt) obtained from USDA NASS QS.
- *corn\_oil*: Monthly production of corn oil at dry mill alcohol production facilities in the United States (in T) obtained from USDA NASS QS.
- *cgf*: Monthly production of corn gluten feed at dry mill alcohol production facilities in the United States (in T) obtained from USDA NASS QS.
- *cgm*: Monthly production of corn gluten meal at dry mill alcohol production facilities in the United States (in T) obtained from USDA NASS QS.
- *corn\_HFCS*: MY U.S. corn use to produce high-fructose corn syrup (in MT) obtained from the ERS FGD.
- *corn\_gludex*: MY U.S. corn use to produce glucose and dextrose (in MT) obtained from the ERS FGD.
- *corn\_starch*: MY U.S. corn use to produce starch (in MT) obtained from the ERS FGD.
- *dregs\_x*: Monthly U.S. exports of brewing or distilling dregs and waste (HS code 2303300000) (in MT) obtained from FAS GATS.
- *dregs\_m*: Monthly U.S. imports of brewing or distilling dregs and waste (HS code 2303300000) (in MT) obtained from FAS GATS.
- *gluten\_feed\_x*: Monthly U.S. exports of corn gluten feed (HS code 2303100010) (in MT) obtained from FAS GATS.
- *gluten\_feed\_m*: Monthly U.S. imports of corn gluten feed (HS code 2303100010) (in MT) obtained from FAS GATS.
- *gluten\_meal\_x*: Monthly U.S. exports of corn gluten meal (HS code 2303100020) (in MT) obtained from FAS GATS.
- *gluten\_meal\_m*: Monthly U.S. imports of corn gluten meal (HS code 2303100020) (in MT) obtained from FAS GATS.

To retrieve the NASS data, the following NASS QS query parameters can be used:

- *corn4Beverage* and *corn4IndAlc*:
  - *corn4Beverage*: “CORN, FOR BEVERAGE ALCOHOL - USAGE, MEASURED IN BU”
  - *corn4IndAlc*: “CORN, FOR INDUSTRIAL ALCOHOL - USAGE, MEASURED IN BU”
  - Commodity: “CORN”

- Category: “USAGE”
- Data Item: “CORN, FOR FUEL ALCOHOL - USAGE, MEASURED IN BU”
- Domain: “TYPE OF OPERATION”
- The resulting data can be filtered to Domain Category = “TYPE OF OPERATION (DRY MILL PLANT)” for *dryCorn4Fuel* or to Domain Category = “TYPE OF OPERATION (WET MILL PLANT)” for *wetCorn4Fuel*.
- Commodity: “SORGHUM”
- Category: “USAGE”
- Data Item: “SORGHUM, FOR FUEL ALCOHOL - USAGE, MEASURED IN CWT”
- Commodity: “ALCOHOL COPRODUCTS”
- Category: “PRODUCTION”
- Data Item:
- *corn\_oil*: “ALCOHOL COPRODUCTS, CORN DISTILLERS OIL (CDO) - PRODUCTION, MEASURED IN TONS”
- *cgf*: “ALCOHOL COPRODUCTS, CORN GLUTEN FEED, MEDIUM PROTEIN, FROM BRAN & STEEP WATER - PRODUCTION, MEASURED IN TONS”
- *cgm*: “ALCOHOL COPRODUCTS, CORN GLUTEN MEAL, HIGH PROTEIN CONCENTRATE - PRODUCTION, MEASURED IN TONS”Commodity: “CORN”
- Category: “USAGE”
- Data Item:
- *dryCorn4Fuel* and *wetCorn4Fuel*:
- *sorg4Fuel:corn\_oil*, *cgf*, and *cgm*:

To retrieve the FGD data, the following FGD query parameters can be used:

- *corn\_HFCS*:
  - Group (Commodity or Data Type): “Corn”
  - Data Attribute: “High-fructose corn syrup (HFCS) use”
- *corn\_gludex*:
  - Group (Commodity or Data Type): “Corn”
  - Data Attribute: “Glucose and dextrose use”
- *corn\_starch*:
  - Group (Commodity or Data Type): “Corn”
  - Data Attribute: “Starch use”

The FAS GATS data can be retrieved using the following “Standard Query” parameters:

- *dregs\_x*, *gluten\_feed\_x*, *gluten\_meal\_x*:

- “2303100010 - CORN GLUTEN FEED”
- “2303100020 - CORN GLUTEN MEAL”
- “2303300000 - BRWR,DTLR,GRN”
- Value: “(None)”
- Quantity: “Quantity”, “FAS Non Converted”
- Series: “Monthly”
- Monthly Range: Jan–Dec
- Year Range: 1989–Present
- Data Source: “FAS U.S. Trade”
- Product Type: “Exports”
- Product Groups: “Harmonized (HS-10)”
- Partners: “World Total”
- Products: “23 - Residues And Waste From the Food In”
- Statistics:
- Dates:
- End Month: Most recent available
- *dregs\_m, gluten\_feed\_m, gluten\_meal\_m:*
  - “2303100010 - CORN GLUTEN FEED”
  - “2303100020 - CORN GLUTEN MEAL”
  - “2303300000 - BREWING OR DISTI”
  - Value: “(None)”
  - Quantity: “Quantity”, “FAS Non Converted”
  - Series: “Monthly”
  - Monthly Range: Jan–Dec
  - Year Range: 1989–Present
  - Data Source: “FAS U.S. Trade”
  - Product Type: “Imports - Consumption”
  - Product Groups: “Harmonized (HS-10)”
  - Partners: “World Total”
  - Products: “23 - Residues And Waste From the Food In”
  - Statistics:
  - Dates:
  - End Month: Most recent available

QS and GATS data are converted from monthly values to corn MY values by summing values across the months in the corn MY. The QS data begin in October of 2014, which is the second

month of the 2014/15 corn MY. To estimate values for the complete 2014/15 corn MY for the NASS data series, the September 2014 values for these series are set equal to their October 2014–August 2015 averages. For example, the September 2014 value of *dryCorn4Fuel* is set to the average of the October 2014–August 2015 *dryCorn4Fuel* values. These raw data are used to construct additional data series as follows:

- $tot\_corn\_dg$  = Total corn used in the production of alcohol at dry mill plants (bu) =  $corn4IndEth * dry\_ind + corn4Beverage * dry\_bev + dryCorn4Fuel$ .
- $oil\_yield$  = Corn oil produced per bushel of corn used in the production of alcohol at dry mill plants (lbs/bu) =  $2000 * corn\_oil / tot\_corn\_dg$ .
- $dg\_prod$  = Production of distillers grains (MM MT) =  $(tot\_corn\_dg * (corn\_dg - oil\_yield) + 100 * sorg4Fuel * sorg\_dg / lbs\_per\_sorg) / (lbs\_per\_mt * 1000000)$ .
- $dg\_tot\_supply$  = Total supply of distillers' grains (MM MT) =  $dg\_prod + dregs\_m$ .
- $dg\_dom\_use$  = Domestic use of distillers' grains (MM MT) =  $dg\_tot\_supply - dregs\_x$ .
- $dg\_tot\_use$  = Total use of distillers' grains (MM MT) =  $dg\_tot\_supply$ .
- $tot\_corn\_cgm$  = Total corn used in the production of high fructose corn syrup (HFCS), glucose, dextrose, and starch (MM bu) =  $corn\_HFCS + corn\_gludex + corn\_starch$ .
- $cgm2$  = Corn gluten meal produced during production of HFCS, glucose, dextrose, and starch (MM MT) =  $tot\_corn\_cgm * cgm\_bu / lbs\_per\_mt$ .
- $cgm\_prod$  = Total production of corn gluten meal (MM MT) =  $2000 * cgm / (1000000 * lbs\_per\_mt) + cgm2$ .
- $cgm\_tot\_supply$  = Total supply of corn gluten meal (MM MT) =  $cgm\_prod + gluten\_meal\_m$ .
- $cgm\_dom\_use$  = Domestic use of corn gluten meal (MM MT) =  $cgm\_tot\_supply - gluten\_meal\_x$ .
- $cgm\_tot\_use$  = Total use of corn gluten meal (MM MT) =  $cgm\_tot\_supply$ .
- $tot\_corn\_cgf$  = Total corn used in the production of high fructose corn syrup (HFCS), glucose, dextrose, and starch (MM bu) =  $corn\_HFCS + corn\_gludex + corn\_starch$ .
- $cgf2$  = Corn gluten feed produced during production of HFCS, glucose, dextrose, and starch (MM MT) =  $tot\_corn\_cgf * cgf\_bu / lbs\_per\_mt$ .
- $cgf\_prod$  = Total production of corn gluten feed (MM MT) =  $2000 * cgf / (1000000 * lbs\_per\_mt) + cgf2$ .
- $cgf\_tot\_supply$  = Total supply of corn gluten feed (MM MT) =  $cgf\_prod + gluten\_feed\_m$ .
- $cgf\_dom\_use$  = Domestic use of corn gluten feed (MM MT) =  $cgf\_tot\_supply - gluten\_feed\_x$ .
- $cgf\_tot\_use$  = Total use of corn gluten feed (MM MT) =  $cgf\_tot\_supply$ .

The values associated with the USBS **data\_item** field categories are set equal to one of the raw or calculated data series as follows:

- Values where the USBS **table** field = 8.1 (equivalently, where the USBS **commodity** field = "Distillers grains"):

- Values where the USBS **data\_item** field = “Domestic use” are set equal to *dg\_dom\_use*.
- Values where the USBS **data\_item** field = “Exports” are set equal to *dregs\_x*.
- Values where the USBS **data\_item** field = “Imports” are set equal to *dregs\_m*.
- Values where the USBS **data\_item** field = “Production” are set equal to *dg\_prod*.
- Values where the USBS **data\_item** field = “Total supply” are set equal to *dg\_tot\_supply*.
- Values where the USBS **data\_item** field = “Total use” are set equal to *dg\_tot\_use*.
- Values where the USBS **table** field = 8.2 (equivalently, where the USBS **commodity** field = “Corn gluten meal”):
  - Values where the USBS **data\_item** field = “Domestic use” are set equal to *cgm\_dom\_use*.
  - Values where the USBS **data\_item** field = “Exports” are set equal to *gluten\_meal\_x*.
  - Values where the USBS **data\_item** field = “Imports” are set equal to *gluten\_meal\_m*.
  - Values where the USBS **data\_item** field = “Production” are set equal to *cgm\_prod*.
  - Values where the USBS **data\_item** field = “Total supply” are set equal to *cgm\_tot\_supply*.
  - Values where the USBS **data\_item** field = “Total use” are set equal to *cgm\_tot\_use*.
- Values where the USBS **table** field = 8.3 (equivalently, where the USBS **commodity** field = “Corn gluten feed”):
  - Values where the USBS **data\_item** field = “Domestic use” are set equal to *cgf\_dom\_use*.
  - Values where the USBS **data\_item** field = “Exports” are set equal to *gluten\_feed\_x*.
  - Values where the USBS **data\_item** field = “Imports” are set equal to *gluten\_feed\_m*.
  - Values where the USBS **data\_item** field = “Production” are set equal to *cgf\_prod*.
  - Values where the USBS **data\_item** field = “Total supply” are set equal to *cgf\_tot\_supply*.
  - Values where the USBS **data\_item** field = “Total use” are set equal to *cgf\_tot\_use*.

Data prior to the 2014/15 corn MY are historical ERS estimates, for which no documentation is available.

## Table 9

The distillers dried grains prices found where the USBS **table** field = 9 are obtained from the FGD. Two different price series are used: Distillers grains prices from Lawrenceburg, IN for the 1981/82–1999/2000 MYs and distillers grains prices for Central Illinois (IL) for MY 2000/01 onward. These price series can be retrieved by using the following query settings in the FGD:

- For the Lawrenceburg, IN price series:
  - FGD “Group (Commodity or Data Type)” field = “Prices”
  - FGD “Item” field = “Distillers dried grains”
  - FGD “Geography” field = “U.S. - Lawrenceburg, IN”
  - FGD “Frequency field = “Monthly”

- FGD “Year” field = 1981–1999
- For the Central IL price series:
  - FGD “Group (Commodity or Data Type)” field = “Prices”
  - FGD “Item” field = “Distillers dried grains”
  - FGD “Geography” field = “U.S. - Central IL”
  - FGD “Frequency field = “Monthly”
  - FGD “Year” field = 2000–present

The MY prices are a simple average of the MY monthly prices. For example, the 2021/22 MY price (i.e., the value where the USBS **year** field = 2021 and the USBS **period\_desc** field = “Corn marketing year (Sep-Aug)”) is the average of the monthly prices from September 2021–August 2022 (i.e., the values where the USBS **year** field = 2021 and the USBS **period** field is in {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}).

## Tables 10–12

Data where the USBS **table** field is in {10, 11, 12} come from the following sources:

- Values where the USBS **table** field = 10:
  - Values where the USBS **data\_item** field = “Production capacity” are from EIA’s [“U.S. Fuel Ethanol Plant Production Capacity”](#). U.S. ethanol production capacity prior to 2011 is obtained from the U.S. Department of Energy, Vehicle Technology Office’s [Alternative Fuels Data Center](#). However, this data also cites the EIA “U.S. Fuel Ethanol Plant Production Capacity” as its source. The AFDC reports the data as the ethanol capacity at the end of the preceding year. For example, EIA reports that U.S. ethanol capacity as of January 1, 2022, was 17,380 MM gallons per year. AFDC reports this value as the production capacity for the end of 2021. The USBS follows the EIA convention and reports this value as the U.S. ethanol capacity for January 2022.
  - Values where the USBS **data\_item** field = “Production” are the same USBS values found where the USBS **table** field = 2, the USBS **data\_item** field = “Production”, and the USBS **year** field is greater than or equal 2000.
  - Values where the USBS **data\_item** field = “Production capacity utilization” are calculated as the value where the USBS **data\_item** field = “Production” divided by the value—from the same year CY—where the USBS **data\_item** field = “Production capacity”.
- Values where the USBS **table** field = 11 are from EIA’s [“U.S. Fuel Ethanol Plant Production Capacity”](#).
- Values where the USBS **table** field = 12:
  - Values where the USBS **commodity** field = “Biodiesel” are obtained from EIA’s [“U.S. Biodiesel Plant Production Capacity”](#).

- Values where the USBS **commodity** field = “Renewable diesel and other biofuels (excluding ethanol and biodiesel)” are obtained from EIA’s [“U.S. Renewable Diesel Fuel and Other Biofuels Plant Production Capacity.”](#) These data are meant to capture the following fuels: renewable diesel fuel, renewable heating oil, renewable jet fuel, renewable naphtha and gasoline, and other biofuels (excluding fuel ethanol and biodiesel) and biointermediates.
- Values where the USBS **commodity** field = “Biodiesel, renewable diesel, and other biofuels (excluding ethanol)” are the sum of the values—for the same CY and USBS **data\_item** field category—where the USBS **commodity** field = “Biodiesel” and where the USBS **commodity** field = “Renewable diesel and other biofuels (excluding ethanol and biodiesel)”.

Historically, the USBS used data from the Nebraska Department of Environment and Energy for years prior to 2014. These data were replaced with the EIA data in the April 2023 USBS release.

## Table 13

Data where the USBS **table** field = 13 are obtained from the AFDC’s [“U.S. Public and Private Alternative Fueling Stations by Fuel Type”](#). The “All alternative fuel types” category for the USBS **commodity** field includes biodiesel, compressed natural gas, electric, E85 (85 percent ethanol, 15 percent gasoline), hydrogen, liquefied natural gas, M85 (85 percent methanol, 15 percent gasoline), propane, and renewable diesel. Each station is counted once for each type of fuel sold. For example, if a station offers E85 and biodiesel, the station will count as 2 stations towards the number of stations offering “All alternative fuel types.”

## Table 14

Data sources used in constructing USBS values where the USBS **table** field = 14 and where the USBS **table** field = 15 include the following:

- *corn\_price*: Price received by farmers for corn (\$/bu) obtained from NASS QS.
- *NE\_eth\_price*: Free-on-board rack price for fuel ethanol in Omaha, NE (\$/gallon) obtained from the NDEE. NDEE defines a free-on-board price as “the price actually charged at the point of loading” and a “rack” price as a wholesale price.
- *AMS\_eth\_price*: Freight-on-board price for truck and/or rail delivered ethanol from AMS NWAER through July 14, 2023, and from AMS NWER thereafter. AMS defines “freight-on-board” as “trades made in which the cost of freight is backed off to arrive at the base price of the product. Usually associated with a basis point from which freight is calculated, such as Omaha.”
- *NE\_gas\_price*: Free-on-board rack price for 87-octane unleaded gasoline (\$/gallon) obtained from the NDEE.



- *EIA\_gas\_price*: Spot price for Los Angeles reformulated gasoline blendstock for oxygenate blending.

The *NE\_eth\_price* and *NE\_gas\_price* series can be found at the NDEE link provided at the beginning of this document.

The *AMS\_eth\_price* series can be obtained from the published NWAER and NWER reports. The NWAER reports link to the NWER reports for ethanol prices, so in theory these reports should provide the same prices.

The *corn\_price* series can be retrieved from NASS QS, using the following query parameters:

- Commodity: "CORN"
- Category: "PRICE RECEIVED"
- Data Item: "CORN, GRAIN - PRICE RECEIVED, MEASURED IN \$ / BU"
- Geographic Level: "NATIONAL"
- Period Type: "MONTHLY"

The *EIA\_gas\_price* series can be obtained via EIA's Open Data tool, using the following query parameters:

- API route:
  - API route 1: "Petroleum"
  - API route 2: "Prices"
  - API route 3: "Spot Prices"
- Frequency: "Monthly"
- Filter by facet: "SERIES": "Los Angeles Reformulated RBOB Regular Gasoline Spot Price (Dollars per Gallon) (EER\_EPMRR\_PF4\_Y05LA\_DPG)"

Using these raw data series, the values where the USBS **table** field = 14 are constructed as follows:

- Values where the USBS **commodity** field = "Corn" and the USBS **data\_item** field = "Price" are the same values as in *corn\_price*.
- Values where the USBS **commodity** field = "Corn" and the USBS **data\_item** field = "Blend cost" are the values in *corn\_price* divided by 2.7. This is meant to estimate the cost of corn per gallon of ethanol assuming an ethanol yield of 2.7 gallons per bushel of corn.
- Values where the USBS **commodity** field is "Fuel ethanol":
  - If the USBS **data\_item\_desc** field = "Free-on-board rack price", these are the values in *NE\_eth\_price*. These USBS values span January 1982 through August 2007.
  - If the USBS **data\_item\_desc** field = "Freight-on-board, truck and/or rail delivery price", these are the values in *AMS\_eth\_price*. These USBS values span September 2007 onward.

The *AMS\_eth\_price* series is typically published on Friday of each week. The reports will either include a high and a low price, a single price, or no price at all for various locations. If only a single price was given for a particular location for a particular week, both the “high” and “low” values for that location and week are assigned the reported price. Then, to obtain monthly prices, the location specific prices for a given report are first averaged to create a single price for that location and report date. This price is then used to back fill preceding days for that location until the previous report date is reached. For example, suppose for April 21, 2023, AMS reported prices of \$2.27–2.41/gallon for Iowa (IA), \$2.30–2.31/gallon for Minnesota (MN), \$2.28–2.40/gallon for Nebraska (NE), \$2.30/gallon for South Dakota (SD), and \$2.42–2.46/gallon for the Eastern Corn Belt (ECB). The average prices for April 21, 2023, would then be \$2.34/gallon for IA, \$2.305/gallon for MN, \$2.34/gallon for NE, \$2.30/gallon for SD, and \$2.44/gallon for the ECB. Assuming AMS published ethanol prices for each location on April 14, 2023, these average prices would be used for each location from April 14, 2023–April 21, 2023. If AMS did not publish ethanol prices for one or more locations on April 14, 2023, the respective prices would be used until the previous report with ethanol prices for these locations was reached. For each location, the earliest price reported is used to back fill 6 days. For example, if ethanol prices were first reported for Minnesota on January 30, 2009, the average Minnesota price from this report would be used to back fill Minnesota prices for January 24, 2009–January 29, 2009. This process yields a continuous series of daily prices for each location. This set of daily prices is then used to calculate average prices for each CY and month for each location. Finally, the monthly prices are averaged across all available locations to yield a single average price for that CY and month. For example, suppose the process above yielded the following average prices for April 2023: \$2.36/gallon for IA, \$2.32/gallon for MN, \$2.34/gallon for NE, \$2.32/gallon for SD, and \$2.43/gallon for the ECB. Then the USBS value where the **year** field = 2023 and the **period** field = 4 would be  $(2.36+2.32+2.34+2.32+2.43)/5 = \$2.354/\text{gallon}$  while the **location** field is set to “ECB, IA, MN, NE, SD”.

- Values where the USBS **commodity** field = “Fuel ethanol” and the USBS **data\_item** field = “Blend cost” are the values where the USBS **commodity** field = “Fuel ethanol” and the USBS **data\_item\_desc** field is in {“Free-on-board rack price”, “Freight-on-board, truck and/or rail delivery price”} minus applicable Federal tax credits for blending fuel ethanol with gasoline:
  - \$0.54/gallon from January 1991–December 2004
  - \$0.51/gallon from January 2005–December 2008
  - \$0.45/gallon from January 2009–December 2011
- Values where the USBS **data\_item\_desc** field = “Price in dollars per gasoline-equivalent gallon” are the values where the USBS **commodity** field = “Fuel ethanol” and the USBS **data\_item\_desc** field is in {“Free-on-board rack price”, “Freight-on-board, truck and/or rail delivery price”} divided by 0.67. These values are meant to estimate the cost of ethanol on

a gasoline-equivalent-energy basis. A value of 0.67 is used because ethanol contains approximately 2/3 the energy of gasoline.

- Values where the USBS **commodity** field = “Gasoline” and the USBS **data\_item** field = “Price”:
  - If the USBS **data\_item\_desc** field = “Free-on-board rack price”, these are the values in *NE\_gas\_price*. These values span January 1982 through August 2003.
  - If the USBS **data\_item\_desc** field = “Free-on-board rack price”, these are the values in *EIA\_gas\_price*. These values span September 2003 onward.

In previous versions of the USBS, values where the USBS **table** field = 15 were built by averaging the values where the USBS **table** field = 14 across MYs and MY quarters. Table 15 was deleted in the April 2024 USBS release.

## Table 15

Historically, the values where the USBS **table** field = 15 were found where the USBS **table** field = 16. This changed following the deletion of table 15 beginning with the April 2024 release. Values where the USBS **table** field = 15 are constructed using data from MER Table 10.3—Fuel Ethanol Overview, Table 3.7a—Petroleum Consumption: Residential and Commercial Sectors, Table 3.7b—Petroleum Consumption: Industrial Sector, and Table 3.7c—Petroleum Consumption: Transportation and Electric Power Sectors. Specifically, the following series are used:

- *MER\_eth\_cons*: Monthly U.S. consumption of fuel ethanol (in 1,000 bbl) obtained from MER table 10.3.
- *MER\_eth\_den*: Monthly U.S. consumption of fuel ethanol denaturant (in 1,000 bbl) obtained from MER table 10.3.
- *MER\_gas\_com*: Monthly U.S. consumption of motor gasoline in the commercial sector (in 1,000 bbl/day) obtained from MER table 3.7a.
- *MER\_gas\_ind*: Monthly U.S. consumption of motor gasoline in the industrial sector (in 1,000 bbl/day) obtained from MER table 3.7b.
- *MER\_gas\_tran*: Monthly U.S. consumption of motor gasoline in the transportation sector (in 1,000 bbl/day) obtained from MER table 3.7c.

These data can be retrieved from EIA’s Open Data tool using the following query parameters:

- API Route: “Total Energy”
- Frequency: “Monthly”
- Filter by facet: “MSN”:
  - *MER\_eth\_cons*: “Fuel Ethanol Consumption in Thousand Barrels (ENTCPUS)”
  - *MER\_eth\_den*: “Fuel Ethanol Denaturant in Thousand Barrels (ENDNPUS)”

- *MER\_gas\_com*: “Motor Gasoline Consumed by the Commercial Sector in Thousand Barrels per Day (MGCCPUS)”
- *MER\_gas\_ind*: “Motor Gasoline Consumed by the Industrial Sector in Thousand Barrels per Day (MGICPUS)”
- *MER\_gas\_tran*: “Motor Gasoline Consumed by the Transportation Sector in Thousand Barrels per Day (MGACPUS)”

Values are converted to MM gal/CY as follows:

- *MER\_eth\_cons* and *MER\_eth\_den* are multiplied by *gal\_per\_bbl*; divided by 1,000; and then summed by CY.
- *MER\_gas\_com*, *MER\_gas\_ind*, and *MER\_gas\_tran* are multiplied by *gal\_per\_bbl*; multiplied by the number of days in the respective months, divided by 1,000; and then summed by CY.

Values where the USBS **table** field = 15 are then constructed as follows:

- Values where the USBS **commodity** field = “Fuel ethanol” and the USBS **data\_item** field = “Consumption (excluding denaturant)” are calculated as *MER\_eth\_cons* minus *MER\_eth\_den*.
- Beginning in 1993, the *MER\_gas\_com*, *MER\_gas\_ind*, and *MER\_gas\_tran* data contain fuel ethanol blended into motor gasoline. Thus, the values where the USBS **year** field is less than or equal to 1992, the USBS **commodity** field = “Finished motor gasoline”, and the USBS **data\_item** field = “Consumption (excluding ethanol, including ethanol denaturant)” are calculated as *MER\_gas\_com* + *MER\_gas\_ind* + *MER\_gas\_tran* + *MER\_eth\_den*. The values where the USBS **year** field is greater than 1992, the USBS **commodity** field = “Finished motor gasoline”, and the USBS **data\_item** field = “Consumption (excluding ethanol, including ethanol denaturant)” can be calculated as *MER\_gas\_com* + *MER\_gas\_ind* + *MER\_gas\_tran* + *MER\_eth\_den* - *MER\_eth\_cons* or equivalently as *MER\_gas\_com* + *MER\_gas\_ind* + *MER\_gas\_tran* minus the USBS values where the **commodity** field = “Fuel ethanol” and the **data\_item** field = “Consumption (excluding denaturant)”.
- Values where the USBS **year** field is less than or equal to 1992, the USBS **commodity** field = “Finished motor gasoline”, and the USBS **data\_item** field = “Consumption (including ethanol and ethanol denaturant)” are calculated as *MER\_eth\_cons* + *MER\_gas\_com* + *MER\_gas\_ind* + *MER\_gas\_tran*. Values where the USBS **year** field is greater than 1992, the USBS **commodity** field = “Finished motor gasoline”, and the USBS **data\_item** field = “Consumption (including ethanol and ethanol denaturant)” are calculated as *MER\_gas\_com* + *MER\_gas\_ind* + *MER\_gas\_tran* for 1993 onward.
- Values where the USBS **data\_item** field = “Fuel ethanol share of consumption” are calculated as 100 times the quotient of fuel ethanol consumption (excluding denaturant) divided by finished motor gasoline consumption (including ethanol and ethanol denaturant). For example, fuel ethanol’s share of finished motor gasoline consumption for 2022 is calculated as

100 times the value where the USBS **year** field = 2022 and the USBS **data\_item** field = “Consumption (excluding denaturant)” divided by the value where the USBS **year** field = 2022 and the USBS **data\_item** field = “Consumption (including ethanol and ethanol denaturant)”.

## Tables 16–17

Historically, the values where the USBS **table** field = 16 were found where the USBS **table** field = 17. Similarly, the values where the USBS **table** field = 17 were found where the USBS **table** field = 18. This changed following the deletion of table 15 beginning with the April 2024 release. Values where the USBS **table** field = 16 are constructed using the following raw data series:

- **AMS\_bd\_price**: Freight-on-board, truck delivered biodiesel price (\$/gallon) obtained from AMS NWAER and NWER reports. NWAER reports are used through July 14, 2023, and NWER reports are used thereafter.
- **EIA\_diesel\_price**: Retail price for U.S. number 2 diesel (\$/gallon) obtained from EIA’s Open Data. EIA defines number 2 diesel fuel as “A distillate fuel oil that has a distillation temperature of 640 degrees Fahrenheit at the 90-percent recovery point and meets the specifications defined in ASTM Specification D 975. It is used in high-speed diesel engines that are generally operated under uniform speed and load conditions, such as those in railroad locomotives, trucks, and automobiles.”

The prices contained in *EIA\_diesel\_price* can be retrieved by using the following query parameters in EIA’s Open Data query tool:

- API route:
  - Route 1: “Petroleum”
  - Route 2: “Prices”
  - Route 3: “Weekly Retail Gasoline And Diesel Prices”
- Frequency: “Monthly”
- Filter by facet: Series: “U.S. No 2 Diesel Retail Prices (Dollars per Gallon) (EMD\_EPD2D\_PTE\_NUS\_DPG)”

The prices contained in *AMS\_bd\_price* can be obtained from the historical NWAER and NWER reports published by AMS.

The USBS values are then constructed using these raw data series as follows:

- Values where the USBS **commodity** field = “Biodiesel”: The *AMS\_bd\_price* series is typically published on Friday of each week. The reports will either include a high and a low price, a single price, or no price at all for various locations. If only a single price was given for a particular location for a particular week, both the “high” and “low” values for that location and week are assigned the reported price. Then, to obtain monthly prices, the location

specific prices for a given report are first averaged to create a single price for that location and report date. This price is then used to back fill preceding days for that location until the previous report date is reached. For example, suppose for July 1, 2022, AMS reported a price of \$7.01/gallon for Iowa/Minnesota, a low price of \$6.90/gallon for Illinois/Indiana/Ohio, and a high price of \$6.96/gallon. The average price for July 1, 2022, would then be \$7.01/gallon for Iowa/Minnesota and \$6.93/gallon for Illinois/Indiana/Ohio. Assuming AMS published biodiesel prices for both locations on June 24, 2023, the \$7.01/gallon price would be used for June 25, 2023–June 30, 2023, for Iowa/Minnesota and the \$6.93/gallon price would be used for June 25, 2023–June 30, 2023, for Illinois/Indiana/Ohio. If AMS did not publish biodiesel prices for one or both locations on June 24, 2023, the respective prices would be used until the previous report with biodiesel prices for these locations was reached. This process yields a continuous series of daily prices for each location. This set of daily prices is then used to calculate average prices for each CY and month for each location. Finally, the monthly prices are averaged across all available locations to yield a single average price for that CY and month. For example, suppose the process above yields an average price of \$6.46/gallon for Iowa/Minnesota and an average price of \$6.67/gallon for Illinois/Indiana/Ohio in July 2022. Then the USBS value where the **year** field = 2022 and the **period** field = 7 would be  $(6.46+6.67)/2 = \$6.57/\text{gallon}$  while the **location** field is set to “Illinois/Indiana/Iowa/Minnesota/Ohio”.

- Values where the USBS **commodity** field = “U.S. number 2 diesel”: These values are simply equal to the monthly prices contained in *EIA\_diesel\_price*.

The diesel prices where the USBS **table** field = 17 are the same diesel prices as where the USBS **table** field = 16 only multiplied by 100 to obtain cents per gallon. The annual prices are averages of the monthly prices.

## Strengths and Limitations

This data product brings together data series associated with the U.S. bioenergy industry from multiple sources. As such, the product serves as a “one-stop shop” for those interested in these particular data series, allowing for easy access to several important data series at once. Additionally, the product provides some series that are estimated by ERS and thus not found elsewhere (primarily the data where the USBS **table** field is in {8.1, 8.2, 8.3}). However, the data product is not exhaustive and may omit other series that are of interest to users.

## Resources

ERS:

[Feed Grains Database](#)

[Oil Crops Yearbook](#)

## [Oil Crops Outlook](#)

Other:

AMS, [National Weekly Ag Energy Round-Up](#)

AMS, [National Weekly Ethanol Report](#)

EIA, [Monthly Energy Review](#)

EIA, [U.S. Biodiesel Plant Production Capacity](#)

EIA, [U.S. Fuel Ethanol Plant Production Capacity](#)

EIA, [U.S. Renewable Diesel Fuel and Other Biofuels Plant Production Capacity](#)

EIA, [Open Data](#)

FAS, [Global Agricultural Trade System](#)

NASS, [Quick Stats](#)

NDEE, [Ethanol and Unleaded Gasoline Average Rack Prices](#)

VTO, [Alternative Fuels Data Center](#)

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