
Prepared For:

U.S. Grains Council
National Corn Growers Association

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Disclaimer

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Acronyms

<table>
<thead>
<tr>
<th>CGF</th>
<th>Corn Gluten Feed, an ethanol co-product</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDGS</td>
<td>Dried Distillers Grains with Solubles, an ethanol co-product</td>
</tr>
<tr>
<td>FAS</td>
<td>Foreign Agricultural Service</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>NASS</td>
<td>USDA National Agricultural Statistics Service</td>
</tr>
<tr>
<td>USDA</td>
<td>United State Department of Agriculture</td>
</tr>
</tbody>
</table>
I. EXECUTIVE SUMMARY

A long history of economic work has proven the value of export markets for the agricultural industry. The vast majority of agricultural producers and businesses relating to agriculture readily recognize the economic value of export markets and support policies that will encourage continued exports. What is less well known is how these same agricultural exports benefit the U.S. economy, or even state or congressional district economies.

This study examined the economic contributions provided by exports of barley, sorghum, corn, ethanol, dried distillers grains with solubles, corn gluten feed, and the corn equivalent of meat on the U.S. economy. Specifically, the economic contributions provided by each U.S. state and 52 selected congressional districts are analyzed individually with the goal of quantifying the degree to which state and congressional district economies rely upon and benefit from grain exports.

Results from the analysis show that the $19.4 billion in grain and grain products exported generated total economic output of $82 billion in 2014. In other words, access to international export markets for U.S. grains generated an additional $62.6 billion in business sales during 2014. Moreover, the export of grain products increased U.S. GDP by $32.9 billion over what would have occurred without such exports. Finally, the number of full-time equivalent jobs linked directly or indirectly to grain exports totaled 371,536.

Further analysis shows that for every 1 job directly involved in the export of grain and grain products, an additional 6.9 jobs are created in the U.S. economy. Additionally, every $1 of grain product exports generates, through indirect and induced business activities, an additional $3.23 in business sales across the United States.

The positive effects of grain export activities extend well beyond the agricultural industry. Indeed, the top ten industries (as ranked by GDP gained) benefiting from grain exports include wholesale trade, real estate, oil and natural gas production, and banking and financial institutions. As ranked by the number of jobs created by grain exports the full- and limited-service restaurants, hospitals, employment services, real estate, and wholesale trade industries are in the top-ten industries benefiting from job growth.

The above results highlight the important role grain and grain products play in the U.S. economy. Fair and transparent access to international markets creates economic benefits that extend well beyond the nation’s farmlands, with the benefits reaching nearly every sector of the U.S. economy.
II. INTRODUCTION

It is well known that exports of agricultural products provide significant economic benefits to the agricultural industry and to states producing agricultural goods. Exports to international markets represent additional demand for agricultural products that would not exist otherwise and effectively shift the demand curve for U.S. grains outward. As a result, U.S. grain and grain products producers are able to market higher quantities of grain at higher prices directly because of the export demand. Accordingly, exports are critically important to the agricultural industry and to farmers and ranchers.

What is less widely known is how exports of agricultural products impact the rest of the U.S. economy. While agricultural industries clearly benefit from exporting products to international markets, it is less clear the degree to which other industries benefit from these same exports. Economic theory suggests that increased demand for U.S. grain products increases production of U.S. grains. This, in turn, would raise demand for inputs into grain product production (like fertilizer, farm machinery, etc.) and would result in a positive economic gain for these industries as well. This work quantifies the economic benefits grain product exports provide to the U.S. economy and its various sectors.

This study was commissioned by the U.S. Grains Council and the National Corn Growers Association to quantify the holistic economic contributions that exports of grains (barley, sorghum, and corn), ethanol and its co-products (dried distillers grains with solubles, or DDGS, and corn gluten feed), and the corn equivalent of meat provide to the U.S. economy. Furthermore, this study quantifies the economic contributions that the exports of grains and grain products provide to each individual state in the USA and to selected congressional districts in those states. The objective of this work is to clearly demonstrate the degree to which individual states and congressional districts benefit from exports of agricultural products that are produced within their borders.

The economic benefits shown in this study include those that are gained in industries linked to industries producing grain and grain-related products, like the fertilizer industry that is linked to the corn farming industry. By determining the benefits that accrue along the entire value chain linked to grain and grain product exports, a clearer picture of grain exports true economic importance emerges.

This report first identifies the value of grain product exports originating from each U.S. state and from the selected congressional districts. Subsequently, a description of the specific data and methodologies used in the analysis is provided; followed by the results from the IMPLAN economic input-output models.
Per the request of the U.S. Grains Council and the National Corn Growers Association, 52 congressional districts were included in this analysis. The selected congressional districts were included due to the importance of agriculture in the district’s economy. The complete list of the 52 selected congressional districts is shown in Exhibit 1.

**Exhibit 1: Selected Congressional Districts Included in Study**

<table>
<thead>
<tr>
<th>State</th>
<th>Congressional District</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>Sixteenth Congressional District</td>
</tr>
<tr>
<td>Colorado</td>
<td>Fourth Congressional District</td>
</tr>
<tr>
<td>Illinois</td>
<td>Twelfth Congressional District</td>
</tr>
<tr>
<td>Illinois</td>
<td>Thirteenth Congressional District</td>
</tr>
<tr>
<td>Illinois</td>
<td>Fifteenth Congressional District</td>
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<tr>
<td>Illinois</td>
<td>Sixteenth Congressional District</td>
</tr>
<tr>
<td>Illinois</td>
<td>Seventeenth Congressional District</td>
</tr>
<tr>
<td>Illinois</td>
<td>Eighteenth Congressional District</td>
</tr>
<tr>
<td>Indiana</td>
<td>Second Congressional District</td>
</tr>
<tr>
<td>Indiana</td>
<td>Third Congressional District</td>
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<tr>
<td>Indiana</td>
<td>Fourth Congressional District</td>
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<tr>
<td>Indiana</td>
<td>Fifth Congressional District</td>
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<tr>
<td>Indiana</td>
<td>Sixth Congressional District</td>
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<tr>
<td>Indiana</td>
<td>Eighth Congressional District</td>
</tr>
<tr>
<td>Indiana</td>
<td>Ninth Congressional District</td>
</tr>
<tr>
<td>Iowa</td>
<td>First Congressional District</td>
</tr>
<tr>
<td>Iowa</td>
<td>Second Congressional District</td>
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<tr>
<td>Iowa</td>
<td>Third Congressional District</td>
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<tr>
<td>Iowa</td>
<td>Fourth Congressional District</td>
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<tr>
<td>Kansas</td>
<td>First Congressional District</td>
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<td>Kansas</td>
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<td>Kentucky</td>
<td>First Congressional District</td>
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<td>Maryland</td>
<td>Fifth Congressional District</td>
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<tr>
<td>Maryland</td>
<td>Sixth Congressional District</td>
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<tr>
<td>Michigan</td>
<td>Fourth Congressional District</td>
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<tr>
<td>Michigan</td>
<td>Sixth Congressional District</td>
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<tr>
<td>Michigan</td>
<td>Seventh Congressional District</td>
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<tr>
<td>Minnesota</td>
<td>First Congressional District</td>
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<tr>
<td>Minnesota</td>
<td>Second Congressional District</td>
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<tr>
<td>Minnesota</td>
<td>Seventh Congressional District</td>
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<tr>
<td>Missouri</td>
<td>Fourth Congressional District</td>
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<tr>
<td>Missouri</td>
<td>Fifth Congressional District</td>
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<tr>
<td>Missouri</td>
<td>Sixth Congressional District</td>
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<tr>
<td>Missouri</td>
<td>Eighth Congressional District</td>
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<tr>
<td>Nebraska</td>
<td>First Congressional District</td>
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<tr>
<td>Nebraska</td>
<td>Second Congressional District</td>
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<tr>
<td>Nebraska</td>
<td>Third Congressional District</td>
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<tr>
<td>North Carolina</td>
<td>Seventh Congressional District</td>
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<tr>
<td>Ohio</td>
<td>Fourth Congressional District</td>
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<tr>
<td>Ohio</td>
<td>Fifth Congressional District</td>
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<tr>
<td>Ohio</td>
<td>Eighth Congressional District</td>
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<tr>
<td>Ohio</td>
<td>Tenth Congressional District</td>
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<tr>
<td>Ohio</td>
<td>Fifteenth Congressional District</td>
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<tr>
<td>Texas</td>
<td>Eleventh Congressional District</td>
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<tr>
<td>Texas</td>
<td>Thirteenth Congressional District</td>
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<tr>
<td>Texas</td>
<td>Fifteenth Congressional District</td>
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<tr>
<td>Washington</td>
<td>Eighth Congressional District</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>First Congressional District</td>
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<tr>
<td>Wisconsin</td>
<td>Third Congressional District</td>
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<tr>
<td>Wisconsin</td>
<td>Sixth Congressional District</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>Seventh Congressional District</td>
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</tbody>
</table>
To graphically show the relative importance of each state’s exports relative to other states, Exhibit 2 shows the value of grain and grain products exports from each state. From this, it becomes clear that while all states contribute some form of grain and grain product exports, a handful of states control a significant portion of the overall value of grain exports.

Exhibit 2: Relative Size of U.S. States Grain and Grain Product Exports Value

Note: Bubble size represents exports value in million $USD
Note: Only the 35 states with more than $10 million in grain and grain products exports are shown
Source: USDA NASS, GATS, and Informa Economics IEG
Again, for comparison of one congressional district relative to the others in the report, Exhibit 3 shows the relative value of grain and grain product exports from each congressional district in the study.

Exhibit 3: 2014 Grain and Grain Product Exports by Selected Congressional District

Source: USDA NASS, GATS, and Informa Economics IEG

Having identified the value of exports from each state and congressional district in this study, the remainder of this report is dedicated to explaining the methods used to quantify the economic contributions of grain exports and to exploring the results of the analysis.
III. METHODOLOGY

To estimate the economic impact of corn, barley, sorghum, ethanol, DDGS, corn gluten feed, and meat exports on individual states and congressional districts two key pieces of information were needed: grain and grain product exports and grain and grain product production for each state and congressional district. Data on grain and grain products exports by U.S. state are readily available from USDA FAS and from proprietary databases. This study used in the information from the Global Trade Atlas database to obtain exports of barley, corn, sorghum, ethanol, DDGS, corn gluten feed, and meat (beef, pork, and poultry) export by state. Formulas provided by the U.S. Grains Council were used to convert meat exports into the corn equivalent of meat (a measure that estimates the volume of corn used to produce a pound of meat) units.

A. State Exports

Estimating the volume and value of grain and grain product exports by state was arguably the simplest step in this analysis. The USDA FAS maintains an excellent database of U.S. agricultural product exports by state and many proprietary databases and services do as well. For this analysis, information contained in the proprietary Global Trade Atlas database was used to build grain and grain exports by state.

B. State Production

The USDA National Agricultural Statistics Service (NASS) maintains data on crop and other agricultural product production by state. Additionally, the Census of Agricultural (conducted every 5 years) provides detailed information of production and other economic variables by county. Both datasets (county level production and state level production were used for this report. However, 2014 crop (barley, sorghum, and corn) production was acquired from the USDA NASSS website and was subsequently used in this analysis.

Production for ethanol and its co-products (DDGS and corn gluten feed) and meat production, due to data constraints, was estimated using slightly different methods.

Informa Economics IEG maintains a database of ethanol production facilities along with their estimated production capacity and geographic information. This study leverages this database to build “from the ground up” state ethanol, DDGS, and
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corn gluten feed production by state and congressional district. Informa Economics IEG’s data on production by plant was aggregated into county and state production data.

Information on beef, pork, and poultry meat production was estimated by using different dataset and different approaches. Such methods were necessary due to limited information on production of meats by state. The methods used to estimate state meat production are as follows:

- **Beef production** was created by estimating the share of total U.S. slaughter capacity held by each known plant and aggregating the packing plant specific data to the state level. U.S. total beef production (Informa Economics IEG estimates) was then allocated to each state according to the state’s share of U.S. slaughter capacity.

- **US pork production** was estimated on the county level by taking a county’s share of US hog sales\(^1\) (measured in dollars) and multiplying by Informa’s estimated 2014 pork production. County shares of total U.S. hog sales were estimated by taking dividing a county’s 2012 sales as reported in the national Agricultural Census by the national total hog sales for 2012. The county shares based on 2012 data were multiplied by 2014 NASS-reported U.S. hog sales to estimate individual county sales for 2014. The estimated 2014 county-level sales were subsequently aggregated into state-level data.

- **Similarly, poultry production** (broiler and turkey) was estimated by taking U.S. broiler and turkey production (2014 NASS data) multiplied by a state’s share of U.S. broiler and turkey sales. State shares of broiler and turkey sales were estimated by aggregating individual county shares of state sales based on the 2012 Agricultural Census data.

The differing approach used for beef production (allocation based on slaughter capacity rather than sales) is due to two factors 1) the highly limited nature of state or congressional specific data and 2) the nature of transportation distances in the beef industry. Regarding the first point, due to consolidation in the beef industry limits the data that the USDA can disclose; leaving large holes in state reported data. The second point is relevant because fed cattle are often transported over significant distances from the feedlot to the packing plant whereas pork and poultry are shipped from finishing operations to slaughter plants in often much smaller distances. In essence, most sales of hogs and poultry occur within the same congressional district as they are slaughtered which is often not the case with beef production.

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\(^1\) Obtained from USDA NASS.
Exhibit 4 provides a graphic depiction of how various data were used in the construction of state and congressional district production and export estimates.
Exhibit 4: Methodology for Estimating Select State and Congressional District Production and Export Values

1. 2012 Ag Census Data
2. 2012 County Production
   \[ \frac{2012 \text{ County Production}}{2012 \text{ National Production}} \]
3. County Share of Production
4. County Share of Production \times 2014 National Production
   \[ \frac{\text{Summation of Each County in Congressional District}}{2014 \text{ Congressional District Production}} \]
C. Congressional District Production

For crop production by congressional district, 2014 county-level production (estimated by taking 2012 county share of state production and multiplying by 2014 state production data) data were aggregated into the appropriate congressional districts. Information on specific counties and which congressional district they fall within were available from the U.S. Census Bureau.

Following the same methods used for estimating state ethanol, DDGS, and corn gluten feed production; county-level production estimates from Informa Economics IEG were aggregated to the congressional district level.

Meat production by congressional district followed the same approached that was outlined in section III.B of this report (Methodology: State Production). County-level production estimates were aggregated into the appropriate congressional districts.

When crop production and hog or poultry sales were not available for an individual county in the 2012 Agricultural Census dataset, values were interpolated by dividing the difference between the state’s total production less the sum of reported counties’ production by the number of counties with non-reported or missing values.

D. Congressional District Exports

To estimate barley, sorghum, and corn exports by congressional district, the county share of production was multiplied by the state-level exports. For ethanol, DDGS, and CGF; county shares of state production were multiplied by the reported state-level exports. Finally, meat exports at the congressional district were estimated by a two-step process. First, state meat exports were multiplied by a county’s estimated meat production share (defined in section III.B) to obtain an estimate of county-level meat exports. County-level exports were subsequently aggregated into the appropriate congressional districts.

E. Corn Equivalent of Meat Exports

Due to the high volume of corn included in livestock feeding rations, it can be easily argued that meat production and exports are actually the production and export of corn in a valued-added form. Accordingly, formulas provided by the U.S. Grains Council were used to convert volume and value of U.S. beef, pork, and poultry production into corn equivalent units. In

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2 U.S. Census Bureau. Congressional Districts Relationship Files (State-Based). Available here: [https://www.census.gov/geo/maps-data/data/cd_state.html](https://www.census.gov/geo/maps-data/data/cd_state.html)
essence, the formulas estimate how many pounds of corn were used to create one pound of U.S. meat exports. Such transformation allows for the analysis of the entire role that corn plays in the U.S. economy.

F. IMPLAN Economic Models

To estimate the “ripple effects” of U.S grain and grain product exports have on the entire U.S. economy, IMPLAN® economic input-output software was used. Information gathered in previous chapters was used to quantify the economic impact of grain and grain product exports on the U.S. economy. Results from the models provide insight into the number of full time equivalent (FTE) jobs, Gross Domestic Product (GDP) and output (industry sales) created via three different impacts. The different impacts estimated by IMPLAN are: direct, indirect, and induced and each impact is defined below:

- **Direct impacts** reflect the economic activity that occurs in the industries in which investments are made or changes occur. In the current case, the direct impacts are those that occur at the farm, ethanol production, or meat packing levels. For example, if a congressional district exports $1 million in corn, the direct impact to that district is $1 million in added economic output (that would not have been realized if exports did not occur), along with, say, $750 thousand in GDP added and 10 farming jobs.

- **Indirect impacts** are the additional economic impacts that occur to industries linked to the industry that was directly impacted. For example, increased corn production due to high export sales creates indirect (and positive) impacts on the farm equipment and fertilizer sales industries.

- **Induced impacts** are those impacts created by changes in the spending of labor income and profits generated by the direct and indirect impacts. In the case of corn exports, wages for the jobs directly supported by corn exports are spent on housing, medical treatments, groceries, etc. The spending in these industries creates induced (and positive) impacts for the housing, medical, and grocery store industries, along with other such industries.

For each state and congressional district included in the study, an IMPLAN model was created for each product in the study. Accordingly, it is possible to assess the relative importance of each commodity to an individual state and to assess each state or congressional district’s importance in the export of a single commodity. Individual commodity, congressional district, and state results are shown in individual reports that are separate from this document while the national results are presented here.
IV. RESULTS

A. United States Economic Contributions

Results from IMPLAN models examining the contributions of grain and grain product exports confirm the importance of international markets to the U.S. national economy. In 2014, the U.S. exported $19.4 billion of grain and grain products to international destinations. The direct economic contributions of these exports were 47,213 jobs and $2.8 billion in GDP that was created solely because of grain and grain product exports (Exhibit 5). From this analysis of the direct impacts, it becomes clear that grain and grain products exports are large contributors to the U.S. economy, even before the economic “ripple effects” are accounted for. If U.S. grain and grain product exports were suddenly halted, the figures in Exhibit 5 indicate that over 47,000 jobs and $2.8 billion in GDP would be lost at the farm, ethanol production, and meat production levels alone, before accounting for losses in linked industries.

Exhibit 5: Direct Economic Contributions of U.S. Grain and Grain Product Exports

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Jobs</th>
<th>Labor Income ($ millions)</th>
<th>GDP ($ millions)</th>
<th>Output ($ millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barley</td>
<td>207</td>
<td>$6</td>
<td>$10</td>
<td>$62</td>
</tr>
<tr>
<td>Corn</td>
<td>31,984</td>
<td>$958</td>
<td>$1,491</td>
<td>$9,603</td>
</tr>
<tr>
<td>Sorghum</td>
<td>5,652</td>
<td>$169</td>
<td>$264</td>
<td>$1,697</td>
</tr>
<tr>
<td>Ethanol</td>
<td>938</td>
<td>$115</td>
<td>$238</td>
<td>$2,065</td>
</tr>
<tr>
<td>DDGS CGF</td>
<td>1,448</td>
<td>$177</td>
<td>$367</td>
<td>$3,187</td>
</tr>
<tr>
<td>Corn Equiv. Meat Exports</td>
<td>6,985</td>
<td>$289</td>
<td>$423</td>
<td>$2,733</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>47,213</td>
<td><strong>$1,715</strong></td>
<td><strong>$2,792</strong></td>
<td><strong>$19,347</strong></td>
</tr>
</tbody>
</table>

Source: USDA NASS, GATS, IMPLAN, and Informa Economics IEG

The total economic contributions (direct, indirect, and induced contributions) created by the export of grain and grain products show the true importance of grain exports to the U.S. economy. By including the impacts to industries that are linked (either by

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3 The indirect and induced impacts.
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indirect or induced spending) to grain exports the 2014 U.S. grain export value of $19.4 billion is magnified to a figure of $82 billion in economic output (Exhibit 6). That is, the total economic impact of U.S. grain exports is 3.2 times as large as the value of grain exports. Another way to think of these effects is that for every $1 of grain and grain product exports, another $3.23 in economic output (industry sales) is generated across the United States.

Of course, the economic contributions of grain exports are not limited solely to economic output. As shown in Exhibit 6, the total impact of grain and grain product exports supported 371,536 jobs across the U.S. and $33 billion in GDP in 2014. For every job directly created by the export of grain and grain products, an additional 6.9 jobs were created in the U.S.

Exhibit 6: Total Economic Contribution of U.S. Grain and Grain Products Exports

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Jobs</th>
<th>Labor Income ($ millions)</th>
<th>GDP ($ millions)</th>
<th>Output ($ millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barley</td>
<td>1,366</td>
<td>$65</td>
<td>$112</td>
<td>$259</td>
</tr>
<tr>
<td>Corn</td>
<td>211,541</td>
<td>$10,099</td>
<td>$17,309</td>
<td>$40,083</td>
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<tr>
<td>Sorghum</td>
<td>37,383</td>
<td>$1,785</td>
<td>$3,059</td>
<td>$7,083</td>
</tr>
<tr>
<td>Ethanol</td>
<td>25,250</td>
<td>$1,570</td>
<td>$2,968</td>
<td>$8,870</td>
</tr>
<tr>
<td>DDGS CGF</td>
<td>38,978</td>
<td>$2,424</td>
<td>$4,581</td>
<td>$13,692</td>
</tr>
<tr>
<td>Corn Equiv. Meat Exports</td>
<td>57,018</td>
<td>$2,790</td>
<td>$4,925</td>
<td>$12,053</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>371,536</strong></td>
<td><strong>$18,733</strong></td>
<td><strong>$32,954</strong></td>
<td><strong>$82,040</strong></td>
</tr>
</tbody>
</table>

Source: USDA NASS, GATS, IMPLAN, and Informa Economics IEG

The largest contributions by a single grain or grain product are those made by the export of corn. Corn exports, which totaled over $1.6 billion in 2014, directly supported over 31,000 farm jobs across the United States and generated $958 billion in salaries and wages for those same farmers and their employees. Corn exports also generated $2.72 billion in direct GDP for the United States economy. By the time the indirect and induced effects of corn export are included; corn exports supported 211,541 jobs in the United States and added $17.3 billion in GDP through increased economic output of $40 billion (Exhibit 6).
As measured by GDP, the corn equivalent of meat exports is the second most significant contributor to the U.S. economy. The export of U.S. meats supported 57,018 jobs in the United States and added $4.9 billion in GDP and increased economic output by $12 billion in 2014.

On a national level, none of the crops or products included in this study supports less than 1,000 jobs. Moreover, the export of each commodity supported at least $112 million in GDP, indicating that each commodity in and of its own is a significant contributor to the U.S. economy.

The impact of grain and grain product exports does not benefit all industries to the same degree. Exhibit 7 shows the top ten ranked by employment gains IMPLAN industries that benefit from the export of grains and grain products. As expected, a number of agriculturally-related industries rank near the top of the list for jobs supported by grain and grain product exports.

Exhibit 7: Top Ten Industries, Ranked by Employment Gains, Benefiting from Export of Grains and Grain Products

<table>
<thead>
<tr>
<th>IMPLAN Sector</th>
<th>Description</th>
<th>Jobs</th>
<th>Labor Income ($ millions)</th>
<th>GDP ($ millions)</th>
<th>Output ($ millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Support activities for agriculture and forestry</td>
<td>48,073</td>
<td>$1,613</td>
<td>$1,966</td>
<td>$2,534</td>
</tr>
<tr>
<td>2</td>
<td>Grain farming</td>
<td>40,003</td>
<td>$1,199</td>
<td>$1,865</td>
<td>$12,011</td>
</tr>
<tr>
<td>440</td>
<td>Real estate</td>
<td>14,374</td>
<td>$334</td>
<td>$2,086</td>
<td>$2,828</td>
</tr>
<tr>
<td>395</td>
<td>Wholesale trade</td>
<td>13,735</td>
<td>$1,158</td>
<td>$2,167</td>
<td>$3,347</td>
</tr>
<tr>
<td>11</td>
<td>Beef cattle ranching and farming, including feedlots and dual-purpose ranching and farming</td>
<td>11,043</td>
<td>$270</td>
<td>$676</td>
<td>$1,398</td>
</tr>
<tr>
<td>501</td>
<td>Full-service restaurants</td>
<td>7,289</td>
<td>$166</td>
<td>$180</td>
<td>$327</td>
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<tr>
<td>502</td>
<td>Limited-service restaurants</td>
<td>6,583</td>
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<td>482</td>
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<td>6,268</td>
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<tr>
<td>464</td>
<td>Employment services</td>
<td>5,693</td>
<td>$218</td>
<td>$316</td>
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<tr>
<td>92</td>
<td>Poultry processing</td>
<td>5,590</td>
<td>$217</td>
<td>$275</td>
<td>$1,624</td>
</tr>
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</table>

Source: USDA NASS, GATS, IMPLAN, and Informa Economics IEG

As shown in Exhibit 8, many industries outside of agriculture benefit from the export of grain and grain products. The total GDP generated by industries linked (indirectly or through induced spending) benefits the wholesale trade, real estate, banking, and other such industries. Across the U.S., the wholesale trade industry gained an additional $2.2 billion in GDP because of
Evaluating the Economic Contributions of U.S. Grain Exports on State and Congressional District Economies

grain and grain products exports in 2014. Similarly, $713 million in GDP was added to banking and other financial institutions (IMPLAN industry 433) due to business and financial activities related to the production and export of grain and grain products. Such findings highlight the importance of grain exports and access to export markets for industries beyond agriculture.

**Exhibit 8: Top Ten Industries, Ranked by GDP Gains, Benefiting from Export of Grains and Grain Products**

<table>
<thead>
<tr>
<th>IMPLAN Sector</th>
<th>Description</th>
<th>Jobs</th>
<th>Labor Income ($ millions)</th>
<th>GDP ($ millions)</th>
<th>Output ($ millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>395</td>
<td>Wholesale trade</td>
<td>13,735</td>
<td>$1,158</td>
<td>$2,167</td>
<td>$3,347</td>
</tr>
<tr>
<td>440</td>
<td>Real estate</td>
<td>14,374</td>
<td>$334</td>
<td>$2,086</td>
<td>$2,828</td>
</tr>
<tr>
<td>19</td>
<td>Support activities for agriculture and forestry</td>
<td>48,073</td>
<td>$1,613</td>
<td>$1,966</td>
<td>$2,534</td>
</tr>
<tr>
<td>2</td>
<td>Grain farming</td>
<td>40,003</td>
<td>$1,199</td>
<td>$1,865</td>
<td>$12,011</td>
</tr>
<tr>
<td>441</td>
<td>Owner-occupied dwellings</td>
<td>0</td>
<td>$0</td>
<td>$1,174</td>
<td>$1,778</td>
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<td>20</td>
<td>Extraction of natural gas and crude petroleum</td>
<td>2,423</td>
<td>$314</td>
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<tr>
<td>433</td>
<td>Monetary authorities and depository credit intermediation</td>
<td>3,250</td>
<td>$261</td>
<td>$713</td>
<td>$932</td>
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<tr>
<td>165</td>
<td>Other basic organic chemical manufacturing</td>
<td>2,773</td>
<td>$339</td>
<td>$703</td>
<td>$6,103</td>
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<tr>
<td>11</td>
<td>Beef cattle ranching and farming, including feedlots and dual-purpose ranching and farming</td>
<td>11,043</td>
<td>$270</td>
<td>$676</td>
<td>$1,398</td>
</tr>
<tr>
<td>461</td>
<td>Management of companies and enterprises</td>
<td>4,483</td>
<td>$557</td>
<td>$669</td>
<td>$1,057</td>
</tr>
</tbody>
</table>

Source: USDA NASS, GATS, IMPLAN, and Informa Economics IEG
B. State Economic Contributions

Exhibit 9 shows the total (direct, indirect, and induced) GDP that was created across the United States in 2014 from the export of grains and grain products.

Specific and more detailed information on the economic contributions exports of grain and grain products can be found in the individual state handouts associated with this report and in the state economic contribution ranking tables in section IV.D of this report.

Note: GDP results for Louisiana may be overstated due to the high volume of commodities exported from the Port of New Orleans

Source: IMPLAN and Informa Economics IEG
C. Congressional District Economic Contributions

The results from our analysis show the total GDP generated by exports of grain and grain products totals at least $100,000 for each congressional district included. On the top end, Iowa’s Fourth Congressional District generated $612 million in GDP in 2014 from its grain and grain product exports (Exhibit 10).

Specific and more detailed information on the economic contributions exports of grain and grain products can be found in the
individual congressional district handouts associated with this report and in the district economic contribution ranking tables in section IV.D of this report.

**D. State and Congressional District Rankings**

The tables shown in Exhibit 11 through Exhibit 18 rank the states and congressional districts included in this study by total grain and grain products exports in 2014 and the total economic output, jobs, and GDP created from the export of grains and grain products.
### Exhibit 11: Grain and Grain Product Exports by State, 2014.

<table>
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<tr>
<th>Rank</th>
<th>State</th>
<th>Exports ($ millions)</th>
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<td>$5,650.15</td>
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<tr>
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<td>Illinois</td>
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<td>Texas</td>
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<tr>
<td>50</td>
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</tbody>
</table>

### Exhibit 12: Total Economic Output Created by Grain and Grain Product Exports by State

<table>
<thead>
<tr>
<th>Rank</th>
<th>State</th>
<th>Total Output ($ millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<tr>
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<td>Iowa</td>
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<tr>
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</table>
### Exhibit 13: Total GDP Created by Grain and Grain Product Exports by State

<table>
<thead>
<tr>
<th>Rank</th>
<th>State</th>
<th>Total GDP ($ millions)</th>
</tr>
</thead>
<tbody>
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<td>Louisiana</td>
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### Exhibit 15: 2014 Exports of Grain and Grain Products by Congressional District

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### Exhibit 16: Total Jobs Created from Grain Exports by Congressional District, 2014

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### Exhibit 18: Total Economic Output Created from Grain Exports by Congressional District, 2014

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V. CONCLUSIONS

This work examines and quantifies the economic contributions and benefits that are provided to each U.S. state and selected congressional districts through the export of barley, sorghum, corn, DDGS, corn gluten feed, and the corn equivalent of meats. By analyzing the impacts to individual states and congressional districts, it is possible for policy makers, businesses, and residents of a specific state or congressional district to know how much their economy benefits from and depends upon grain exports.

By using export sales, state and country crop production data, and IMPLAN economic input-output models, the number of jobs, GDP, and economic output (business sales) that are supported by grain exports was estimated. Economic input-output models were created for each commodity and each state/congressional district in the study. Additionally, a national model was created for the U.S. economy to determine the holistic impact grain exports have on the U.S. economy.

The results from this study indicate a total of $80 billion in economic output was generated from the $19.4 billion in grain exports that occurred during 2014. The GDP generated by these exports reached $32.9 billion and 371,536 full-time equivalent are supported by grain exports.

For every 1 job directly supported by grain exports, and additional 6.8 jobs are supported throughout the U.S. economy. For every $1 of grain exports, the economic “ripple effects” add $3.23 to the economy.

The positive impacts of grain exports extend well beyond the agricultural industry. Some of the industries receiving the greatest economic benefit and contribution from grain exports are the wholesale trade, real estate, oil and natural gas production, and banking and financial industries. Also receiving significant economic contributions from grain exports are the full- and limited-service restaurants, hospitals, employment services, real estate, and wholesale trade industries.

Agriculture plays a vital role in the U.S. economy in every state and congressional district. Exports of grains and grain products provide economic benefits to these regions as well. The results of this report help quantify the true economic contributions of exports and export markets to U.S. state and congressional district economies. Realization of the importance of export markets to state and regional economies is the first step to fair and consistent access to international export markets for U.S. grain products. In turn, the economic impacts of grain exports will extend beyond the farmlands and benefit nearly all sectors of state and regional economies.