

# Measuring Supply - Use for Distillers Grains

14<sup>th</sup> Annual Distillers Grains Symposium  
Indianapolis, Indiana  
May 12-13, 2010

Daniel M. O'Brien, PhD.  
Extension Agricultural Economist  
Kansas State University

## Today's Topic

- Projecting supply-demand for distillers grains for the 2010 - 2019 corn marketing years
  - Incorporating DDGS & corn together in combined Corn-DDGS supply-demand balance sheets
  - Sensitivity of Corn-DDGS Supply-Demand Estimates to ethanol & DDGS production scenarios (E-11, E-15, etc.)
  - The \$ value of distillers grains as they displace corn in livestock feed rations

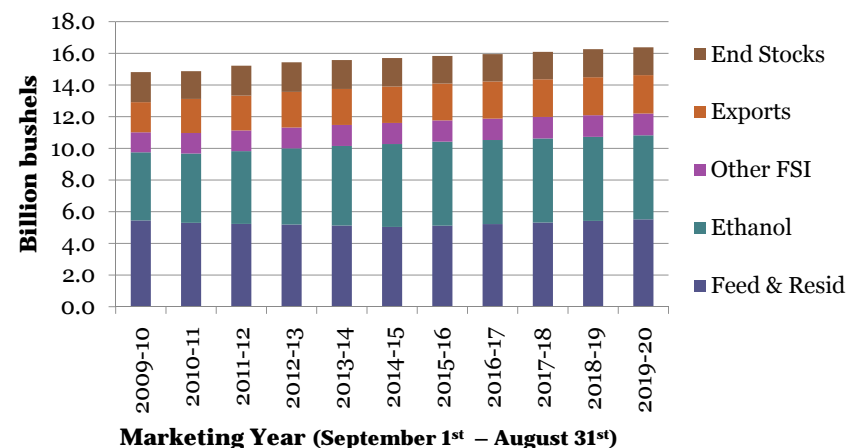
## USDA Ag Projections: 2010-2019

Released February 2010 by USDA - ERS

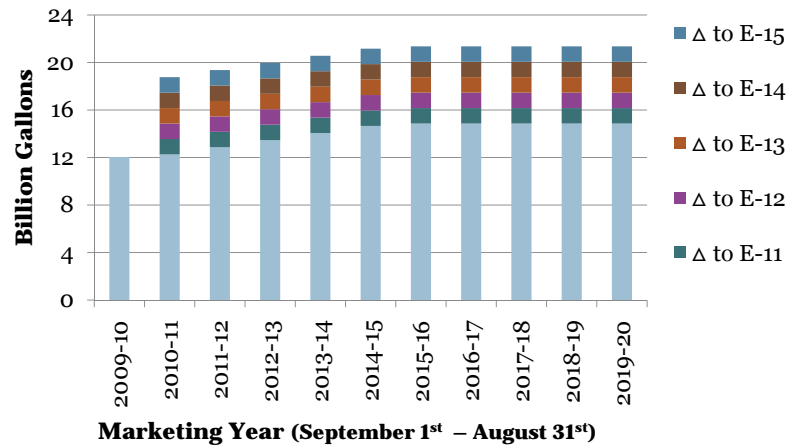
- Crop supply-demand balance sheets
  - Corn, soybeans, soybean meal, wheat, etc.
- Bioenergy-ethanol production (implicit DDGS)
  - Current Renewable Fuels Standard (E-10)
- Livestock production trends
  - Dairy & beef cattle, swine, poultry, other livestock
- U.S. Economy ⇒ Moderate Economic Recovery

## Baseline U.S. Corn Supply-Demand

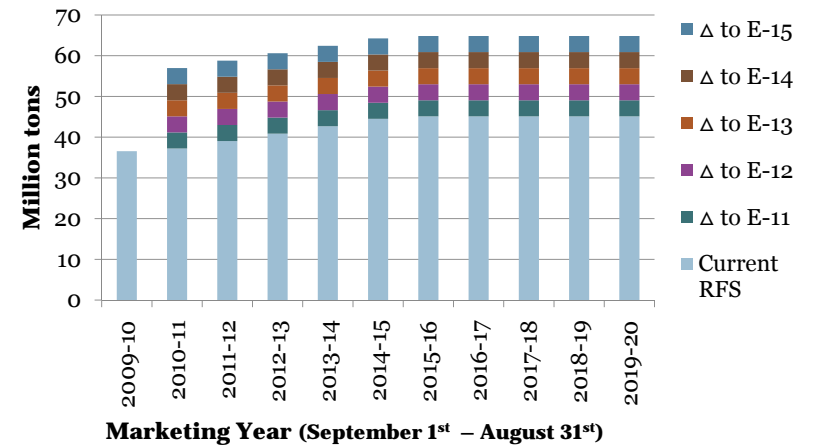
RFS adjusted: Scaled to 15 bln gal. by 2015-16



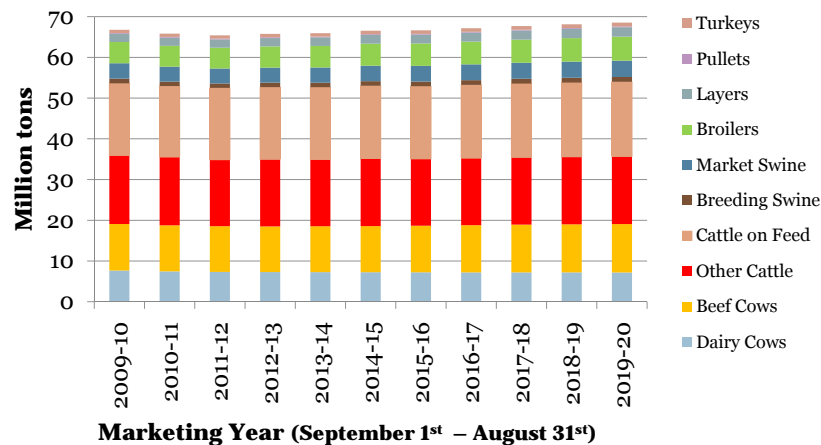
## U.S. Ethanol Production from Corn Assumed Adjustments from Baseline RFS to E-15



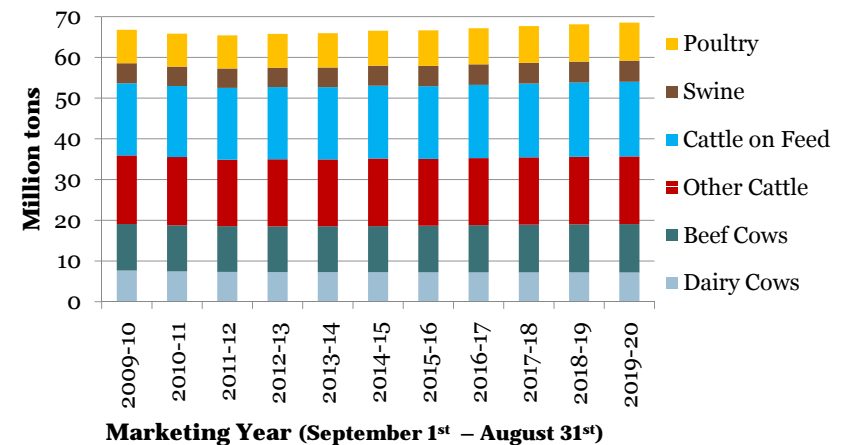
## U.S. DDGS Production: Corn Ethanol Changes from Baseline RFS to E-15 (17 lb DDGS / bu)



## Potential U.S. DDGS Use by Species Ag Baseline Livestock #s + Base DDGS Feed Ratios\*

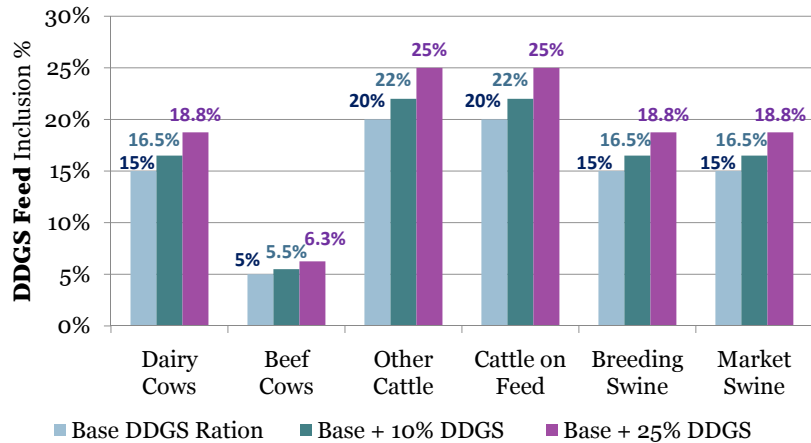


## Potential U.S. DDGS Use - Grouped Ag Baseline Livestock #s + Base DDGS Feed Ratios\*



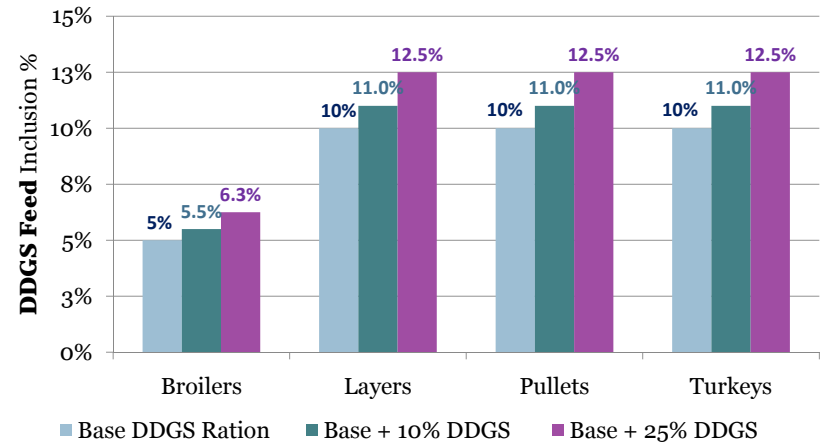
## DDGS Inclusion %: Dairy, Beef, Swine

### % Feed Ration Inclusion Rates



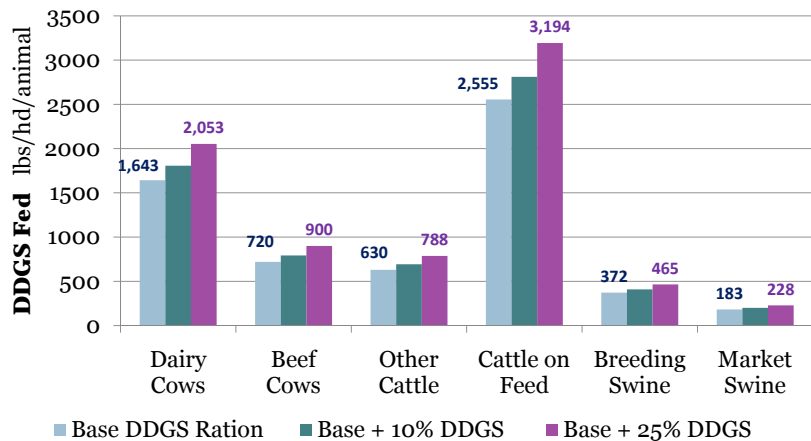
## DDGS Inclusion %: Poultry

### % Feed Ration Inclusion Rates



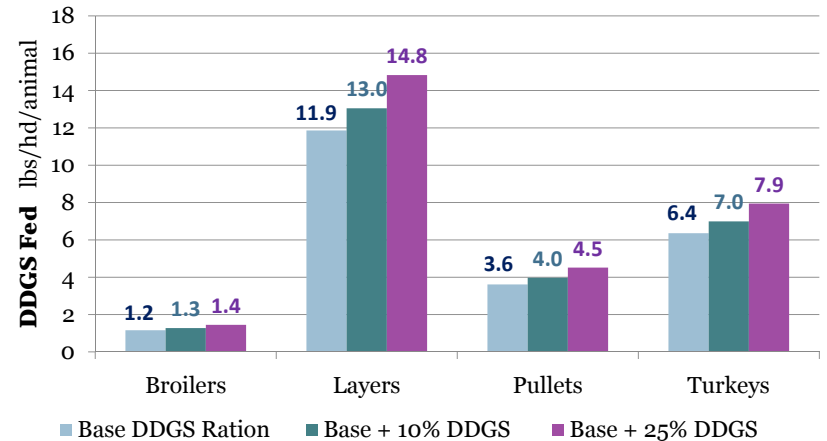
## DDGS Fed: Dairy, Beef, Swine

### DDGS Fed (lbs / head / animal)

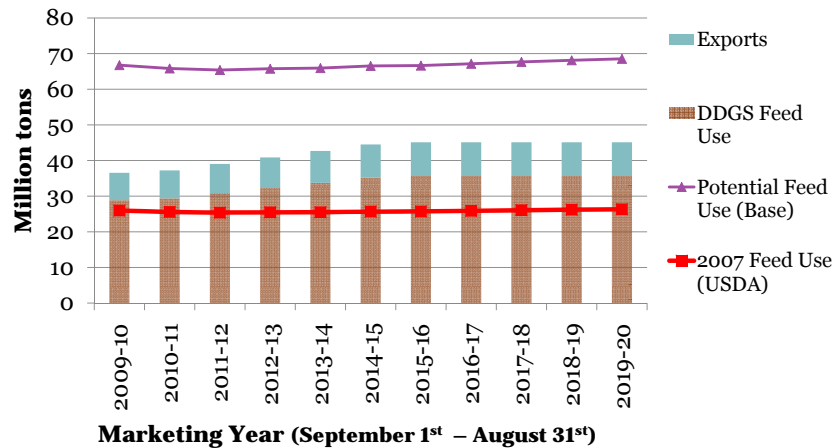


## DDGS Fed: Poultry

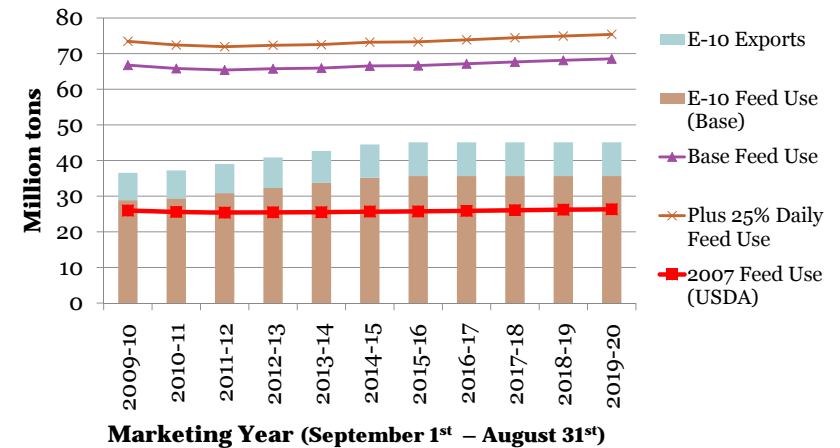
### DDGS Fed (lbs / head / animal)



## Base Scenario: DDGS Feed, Exports & Potential Feed Use



## Plus 25% DDGS per Day Feed Current Ethanol Production, Exports (21% DDGS)



## U.S. Corn + DDGS Supply-Demand Base Ethanol & Livestock Feed Scenario (Billion Bushels)

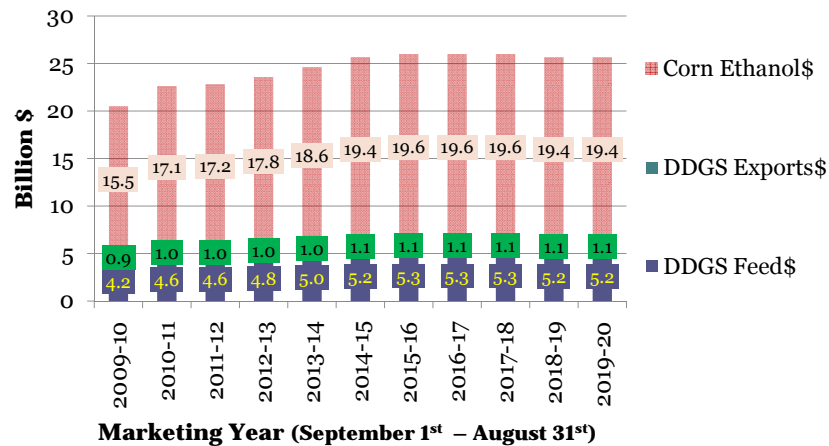
Item	2009-10	2012-13	2015-16	2019-20
Corn Production	13.13	13.53	14.02	14.59
DDGS Prodn. (Corn equivalent)	1.31	1.46	1.61	1.61
Feed & Residual: Corn	5.45	5.19	5.12	5.52
Feed : DDGS (Corn equivalent)	1.03	1.15	1.27	1.27
Ethanol: Corn	4.30	4.81	5.31	5.31
Non-Ethanol FSI: Corn	1.27	1.32	1.34	1.38
Exports: Corn	1.90	2.25	2.33	2.43
Exports: DDGS (Corn equivalent)	0.27	0.31	0.34	0.34
<b>Total Use: Corn+DDGS</b>	<b>14.22</b>	<b>14.72</b>	<b>15.36</b>	<b>15.90</b>
<b>End Stocks: Corn+DDGS</b>	<b>1.90</b>	<b>1.86</b>	<b>1.74</b>	<b>1.76</b>
<b>% End S/U: Corn+DDGS</b>	<b>13.4%</b>	<b>12.4%</b>	<b>11.1%</b>	<b>11.0%</b>

## Sensitivity to Ethanol Production

- Corn Ethanol Use  $\uparrow$  100 million bu ( $P_{\text{Ethanol}} \uparrow$ )
  - $\uparrow$  DDGS<sub>Corn Equivalent</sub> Supply & Feed Use 33 mb
  - $\uparrow$  Total Corn + DDGS<sub>Cn Equiv</sub> Use 133 mb
  - Ending Stocks unchanged
    - All DDGS<sub>Cn Equiv</sub> is used – No carryover of DDGS
- Corn Ethanol Use  $\downarrow$  100 million bu ( $Q_{\text{Corn}} \downarrow$ )
  - $\downarrow$  DDGS<sub>Corn Equivalent</sub> Supply & Feed Use 33 mb
  - $\downarrow$  Total Corn + DDGS<sub>Cn Equiv</sub> Use 133 mb
  - Ending Stocks unchanged

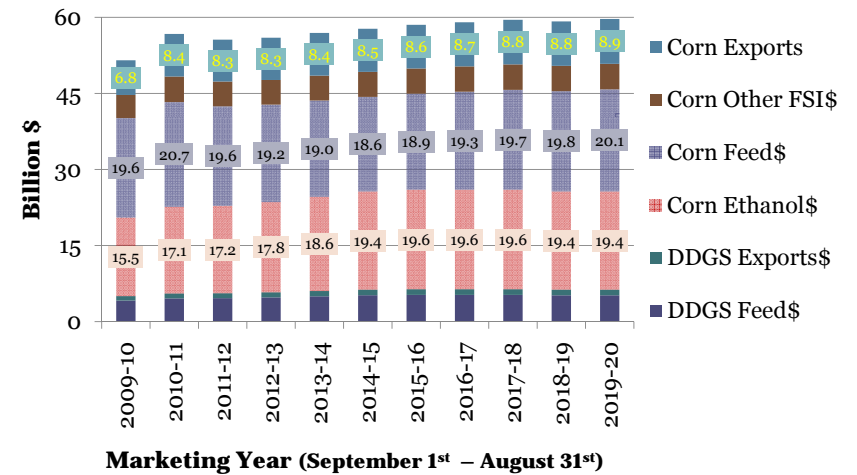
## Changes in Corn-DDGS Value: 2010-2019

Base Ethanol & Livestock Feed (Corn: \$3.60-\$3.90/bu)



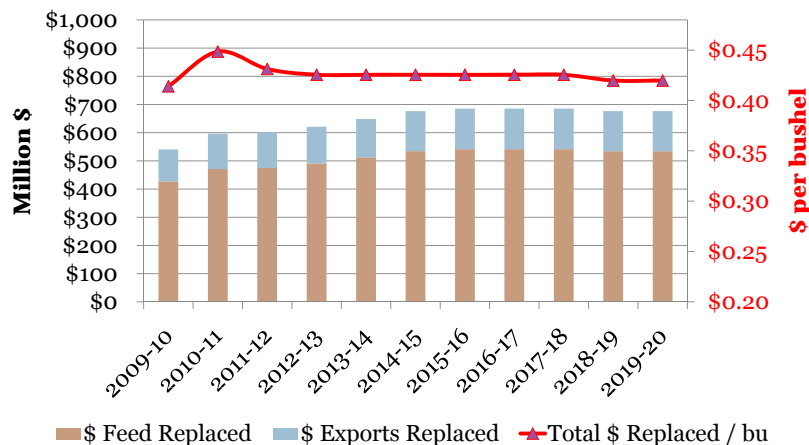
## Changes in Corn-DDGS Value: 2010-2019

Base Ethanol & Livestock Feed (Corn: \$3.60-\$3.90/bu)



## Value of DDGS Substituting for Corn

DDGS value in Corn vs Own \$ (Corn: \$3.60-\$3.90/bu)



## Alternative DDGS S-D Scenarios

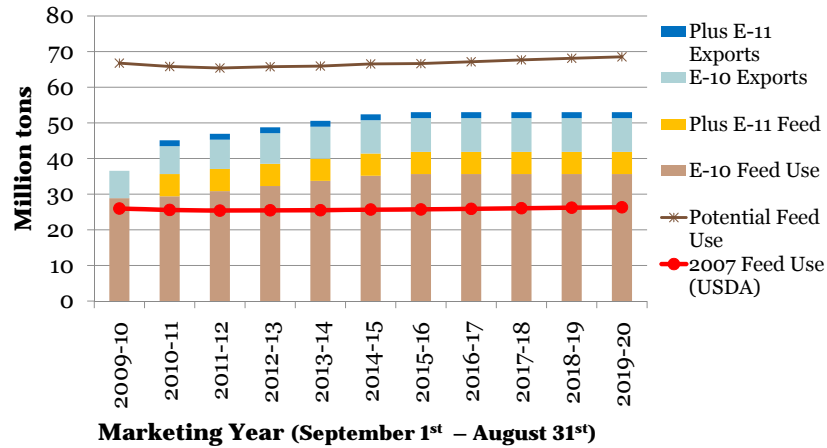
A. Expand Ethanol Output: E-10 to E-11

B. Expand Ethanol Output: E-10 to E-15

- **No Increase** in U.S. Corn Production/year
- **Rebalancing Corn Use**
  - Lower Exports: Less 1.25 bln bu / year
  - Lower Ending Stocks: Less 500 mln bu/ year

## E-11 Scenario: DDGS Use Estimates

### Base DDGS Feed Ratios



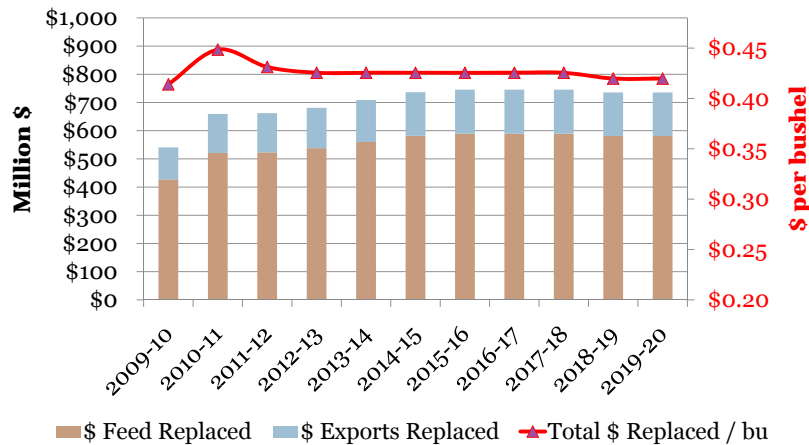
## E-11 Scenario: U.S. Corn + DDGS S-D

### E-11 Ethanol & Base Livestock Feed Scenario (Billion Bushels)

Item	2009-10	2012-13	2015-16	2019-20
Corn Production	13.13	13.53	14.02	14.59
DDGS Prodn. (Corn equivalent)	1.31	+0.14 1.60	+0.14 1.75	+0.14 1.75
Feed & Residual: Corn	5.45	(0.46) 4.73	(0.47) 4.65	(0.47) 5.05
Feed : DDGS (Corn equivalent)	1.03	+0.11 1.26	+0.11 1.38	+0.11 1.38
Ethanol: Corn	4.30	+0.46 5.27	+0.46 5.77	+0.46 5.77
Non-Ethanol FSI: Corn	1.27	1.32	1.34	1.38
Exports: Corn	1.90	2.25	2.33	2.43
Exports: DDGS (Corn equivalent)	0.27	+0.03 0.34	+0.03 0.37	+0.03 0.37
<b>Total Use: Corn+DDGS</b>	<b>14.22</b>	<b>+0.45 15.17</b>	<b>+0.48 15.84</b>	<b>+0.48 16.38</b>
<b>End Stocks: Corn+DDGS</b>	<b>1.90</b>	<b>1.86</b>	<b>1.74</b>	<b>1.76</b>
<b>% End S/U: Corn+DDGS</b>	<b>13.4%</b>	<b>12.4%</b>	<b>11.1%</b>	<b>11.0%</b>

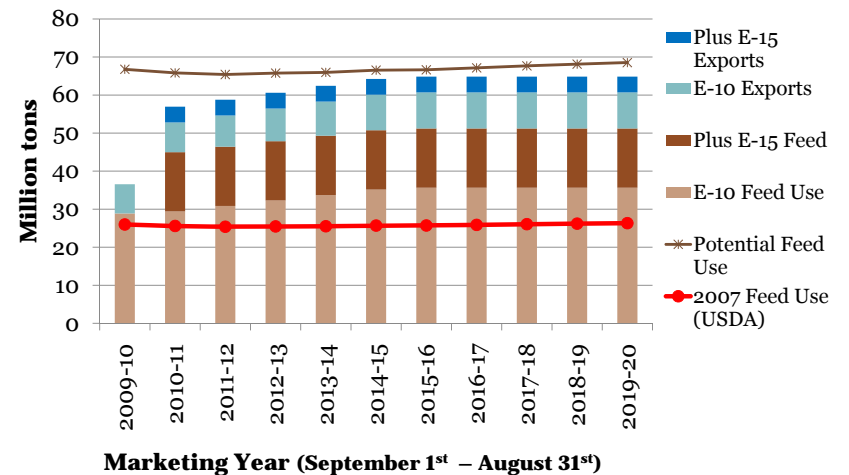
## Value of DDGS Substituting for Corn

### E-11 Ethanol Production Scenario (Corn: \$3.60-\$3.90/bu)



## E-15 Scenario: DDGS Use Estimates

### Base DDGS Feed Ratios



## E-15 Scenario: No S-D Changes

### E-15 Ethanol & Base Feed Scenario (Billion Bushels)

Item	2009-10	2012-13	2015-16	2019-20
Corn Production	13.13	13.53	14.02	14.59
DDGS Prodn. (Corn equivalent)	1.31	+0.70 2.16	+0.71 2.32	+0.71 2.32
Feed & Residual: Corn	5.45	(2.32) 2.87	(2.51) 2.80	(2.32) 3.20
Feed : DDGS (Corn equivalent)	1.03	+0.56 1.71	+0.56 1.83	+0.56 1.83
Ethanol: Corn	4.30	+2.32 7.13	+2.32 7.63	+2.32 7.63
Non-Ethanol FSI: Corn	1.27	1.32	1.34	1.38
Exports: Corn	1.90	2.25	2.33	2.43
Exports: DDGS (Corn equivalent)	0.27	+0.14 0.45	+0.15 0.49	+0.15 0.49
<b>Total Use: Corn+DDGS</b>	<b>14.22</b>	<b>14.72</b>	<b>15.36</b>	<b>15.90</b>
<b>End Stocks: Corn+DDGS</b>	<b>1.90</b>	<b>1.86</b>	<b>1.74</b>	<b>1.76</b>
<b>% End S/U: Corn+DDGS</b>	<b>13.4%</b>	<b>11.9%</b>	<b>10.6%</b>	<b>10.4%</b>

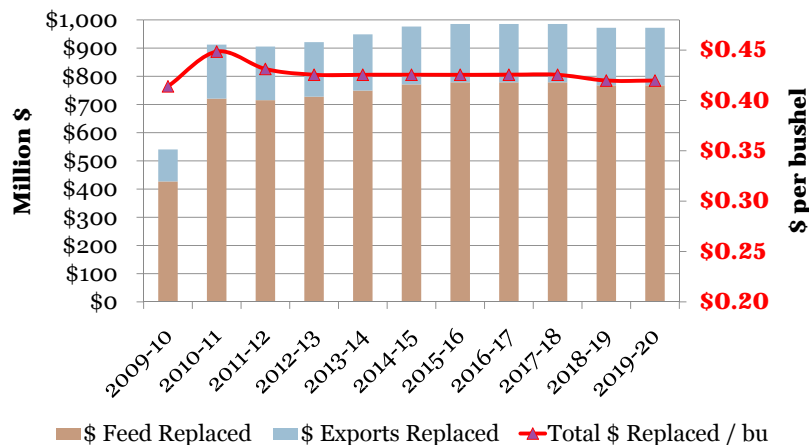
## E-15 Scenario + 1.75 bb. S-D Δ's

### E-15 Ethanol & Base Feed Scenario (Billion Bushels)

Item	2009-10	2012-13	2015-16	2019-20
Corn Production	13.13	13.53	14.02	14.59
DDGS Prodn. (Corn equivalent)	1.31	+0.70 2.16	+0.71 2.32	+0.71 2.32
Feed & Residual: Corn	5.45	(0.51) 4.62	(0.57) 4.55	(0.57) 4.95
Feed : DDGS (Corn equivalent)	1.03	+0.56 1.71	+0.56 1.83	+0.56 1.83
Ethanol: Corn	4.30	+2.32 7.13	+2.32 7.63	+2.32 7.63
Non-Ethanol FSI: Corn	1.27	1.32	1.34	1.38
Exports: Corn	1.27	1.32	1.34	1.38
<b>Exports: Corn</b>	<b>1.90</b>	(1.25) <b>1.00</b>	(1.25) <b>1.08</b>	(1.25) <b>1.18</b>
Exports: DDGS (Corn equivalent)	0.27	+0.14 0.45	+0.15 0.49	+0.15 0.49
<b>Total Use: Corn+DDGS</b>	<b>14.22</b>	+1.51 <b>16.23</b>	+1.55 <b>16.91</b>	+1.54 <b>17.44</b>
<b>End Stocks: Corn+DDGS</b>	<b>1.90</b>	(0.49) <b>1.37</b>	(0.50) <b>1.24</b>	(0.50) <b>1.26</b>
<b>% End S/U: Corn+DDGS</b>	<b>13.4%</b>	<b>8.4%</b>	<b>7.4%</b>	<b>8.2%</b>

## Value of DDGS Substituting for Corn

### E-15 Ethanol Production Scenario (Corn: \$3.60-\$3.90/bu)



## Other Discussion Topics

- Calculations Behind DDGS Displacement Rate Estimates
  - Revisiting the Argonne Laboratory Model
  - Applications of economic profit maximization principles
- Examining the monthly U.S. Census Bureau Report on Wet-Dry Milling Production (M311j)
  - Reconciling M311j with monthly EIA & USDA WASDE reports



## Closing Thoughts

- This presentation is available at the K-State Extension Agricultural Economics Website...

[www.AgManager.info](http://www.AgManager.info)

Daniel O'Brien  
Extension Agricultural Economist  
[dobrien@ksu.edu](mailto:dobrien@ksu.edu)  
785-462-6281