

A photograph of a cornfield at sunset. The sun is low on the horizon, creating a bright glow and lens flare effect. A single, glowing white seed is positioned in the center of the frame, appearing to be the source of the light. The corn plants are silhouetted against the bright sky.

**FOOD AND ENERGY LEADERSHIP
STARTS WITH A SEED AND THE FEED**

Overview

- PURPOSE OF MEETING: Support USDA and USA success with a breakthrough way to produce more food and energy per acre with less environmental impact.
- INTRODUCTIONS: Who we are and why we are here.

KEY POINTS TO COVER

- Consolidate and quantify sustainability, carbon footprint, nitrogen, and protein availability to move beyond commodity basis.
- Science is available but not implemented - Yet.
- The global food supply can be improved with management of natural protein within current agriculture system (soybeans for protein; grains for energy).
- Encourage best management practices to reward quality standards without losing tons.
- Science team “asks” to support USDA mission success





“Looking at every prediction for 2050, we can’t miss any opportunity to produce food more efficiently.”

— Dr. Bart Borg, Standard Nutrition Company

Why the variation In nutrient values (protein or energy) exists

1. Because it can: commodity groups are focused on tons or bushels as Key Performance indicators.
2. The recognition of “inferior” protein or oil content in soybeans could cost producers in marketability of products or reduce tons per acre (etc.)
3. Commodity groups have not yet joined into the sustainability efforts related to end products
4. Inherent carbon footprint increases from livestock growing slower and eating more feed to produce meat.
5. Fear that quality measures will be counterproductive to farm income per acre because of less-than-optimal production practices.
6. The need for a reliable and quick “test” of quality of beans and corn at markets; Quick and accurate recognition of value

Increasing and Predicting Soybean Feed Value

44 SBM Formula Cost - \$191.20
 SBM used/ton - 437.22 lbs
 Corn used/ton - 1,481.49 lbs
 Fat used/ton - 20.87 lbs

Select Ration			<input checked="" type="checkbox"/> Use Base Price	As Fed	Dry Matter	Select Model: <None>		
Optimize	Sub-Rat	Mix	Weight (Lbs.):	2,000.00	1,743.34	Animal Specs	Evaluation	
Save	Re-Load		Base \$/Ton	191.20	219.35	Input/Compare	Projection	
			Adjusted \$/Ton	191.20	219.35	Feed Intake Requirement:		
Make Available	Feasible		Base \$	Adjusted \$	Minimum: 2,000.00			Maximum: 2,000.00
Make Unavailable			Formula Cost	191.20	191.20	Ration Concentration: 87.17		
			Purchased Feed	0.00	0.00	Analysis Basis: <input checked="" type="radio"/> AF I		

Hide Unavailable Ingredients

Is Available	Code	Sub Rat	Name	Base \$/Ton	Mix Item	Amount	Minimum	Maximum	Shadow Price
<input checked="" type="checkbox"/>	4CG013/		Corn Grain	127.00	<input type="checkbox"/>	1,481.49			
<input checked="" type="checkbox"/>	44 G		44 CP SBM	325.00	<input type="checkbox"/>	437.22			
<input checked="" type="checkbox"/>	008220		Calcium Carbonate	42.00	<input type="checkbox"/>	28.10			
<input checked="" type="checkbox"/>	4FT002		Choice White Grease	595.00	<input type="checkbox"/>	20.87		95.00	
<input checked="" type="checkbox"/>	008022		Salt (Bulk)	73.00	<input type="checkbox"/>	10.00	10.00	10.00	
<input checked="" type="checkbox"/>	008466		Lysine - L	1,420.00	<input type="checkbox"/>	7.26		10.00	
<input checked="" type="checkbox"/>	VTM		VTM	2,000.00	<input type="checkbox"/>	5.00	5.00	5.00	
<input checked="" type="checkbox"/>	008203		Monocalcium Phosphate 21%	422.00	<input type="checkbox"/>	4.18			
<input checked="" type="checkbox"/>	008630		Threonine - L	1,720.00	<input type="checkbox"/>	2.51		4.00	
<input checked="" type="checkbox"/>	008468		Methionine - DL	2,500.00	<input type="checkbox"/>	2.44		4.00	
<input checked="" type="checkbox"/>	008629		Tryptophan - L	6,800.00	<input type="checkbox"/>	0.49		2.00	
<input checked="" type="checkbox"/>	008509		Ronozyme 5000FTU/gm	4,444.00	<input type="checkbox"/>	0.45	0.45	0.45	
<input checked="" type="checkbox"/>	9510		L-Isoleucine	10,000.00	<input type="checkbox"/>				
<input checked="" type="checkbox"/>	008628		Valine	7,880.00	<input type="checkbox"/>				7,105.81

50 SBM Formula Cost - \$180.72
 SBM used/ton - 372.67 lbs
 Corn used/ton - 1,563.53 lbs
 Fat used/ton - 2.54 lbs

Select Ration			<input checked="" type="checkbox"/> Use Base Price	As Fed	Dry Matter	Select Model: <None>		
Optimize	Sub-Rat	Mix	Weight (Lbs.):	2,000.00	1,739.12	Animal Specs	Evaluation	
Save	Re-Load		Base \$/Ton	180.72	207.83	Input/Compare	Projection	
			Adjusted \$/Ton	180.72	207.83	Feed Intake Requirement:		
Make Available	Feasible		Base \$	Adjusted \$	Minimum: 2,000.00			Maximum: 2,000.00
Make Unavailable			Formula Cost	180.72	180.72	Ration Concentration: 86.96		
			Purchased Feed	0.00	0.00	Analysis Basis: <input checked="" type="radio"/> AF I		

Hide Unavailable Ingredients

Is Available	Code	Sub Rat	Name	Base \$/Ton	Mix Item	Amount	Minimum	Maximum	Shadow Price
<input checked="" type="checkbox"/>	4CG013/		Corn Grain	127.00	<input type="checkbox"/>	1,563.53			
<input checked="" type="checkbox"/>	50 G		50 CP SBM	325.00	<input type="checkbox"/>	372.67			
<input checked="" type="checkbox"/>	008220		Calcium Carbonate	42.00	<input type="checkbox"/>	28.53			
<input checked="" type="checkbox"/>	008022		Salt (Bulk)	73.00	<input type="checkbox"/>	10.00	10.00	10.00	
<input checked="" type="checkbox"/>	008466		Lysine - L	1,420.00	<input type="checkbox"/>	7.49		10.00	
<input checked="" type="checkbox"/>	VTM		VTM	2,000.00	<input type="checkbox"/>	5.00	5.00	5.00	
<input checked="" type="checkbox"/>	008203		Monocalcium Phosphate 21%	422.00	<input type="checkbox"/>	4.38			
<input checked="" type="checkbox"/>	4FT002		Choice White Grease	595.00	<input type="checkbox"/>	2.54		95.00	
<input checked="" type="checkbox"/>	008630		Threonine - L	1,720.00	<input type="checkbox"/>	2.53		4.00	
<input checked="" type="checkbox"/>	008468		Methionine - DL	2,500.00	<input type="checkbox"/>	2.35		4.00	
<input checked="" type="checkbox"/>	008629		Tryptophan - L	6,800.00	<input type="checkbox"/>	0.53		2.00	
<input checked="" type="checkbox"/>	008509		Ronozyme 5000FTU/gm	4,444.00	<input type="checkbox"/>	0.45	0.45	0.45	
<input checked="" type="checkbox"/>	9510		L-Isoleucine	10,000.00	<input type="checkbox"/>				
<input checked="" type="checkbox"/>	008628		Valine	7,880.00	<input type="checkbox"/>				4,207.95

Initial Soybean Feed and Oil Value Findings-2018

- Soybean feed and oil value are *predictable*
- Field, feed, and oil *value vary widely*
- *Near-zero correlation* with feed value and yield
- Protein pricing *missing billions* in feed value
- *Farmers losing* billions to factory-made feed
- Crop-livestock feed *teamwork needed*
- Then, a nutritionist helped the marketing team see the corn and *the ecosystem became visible*

Corn Demand Increase “Discovered”

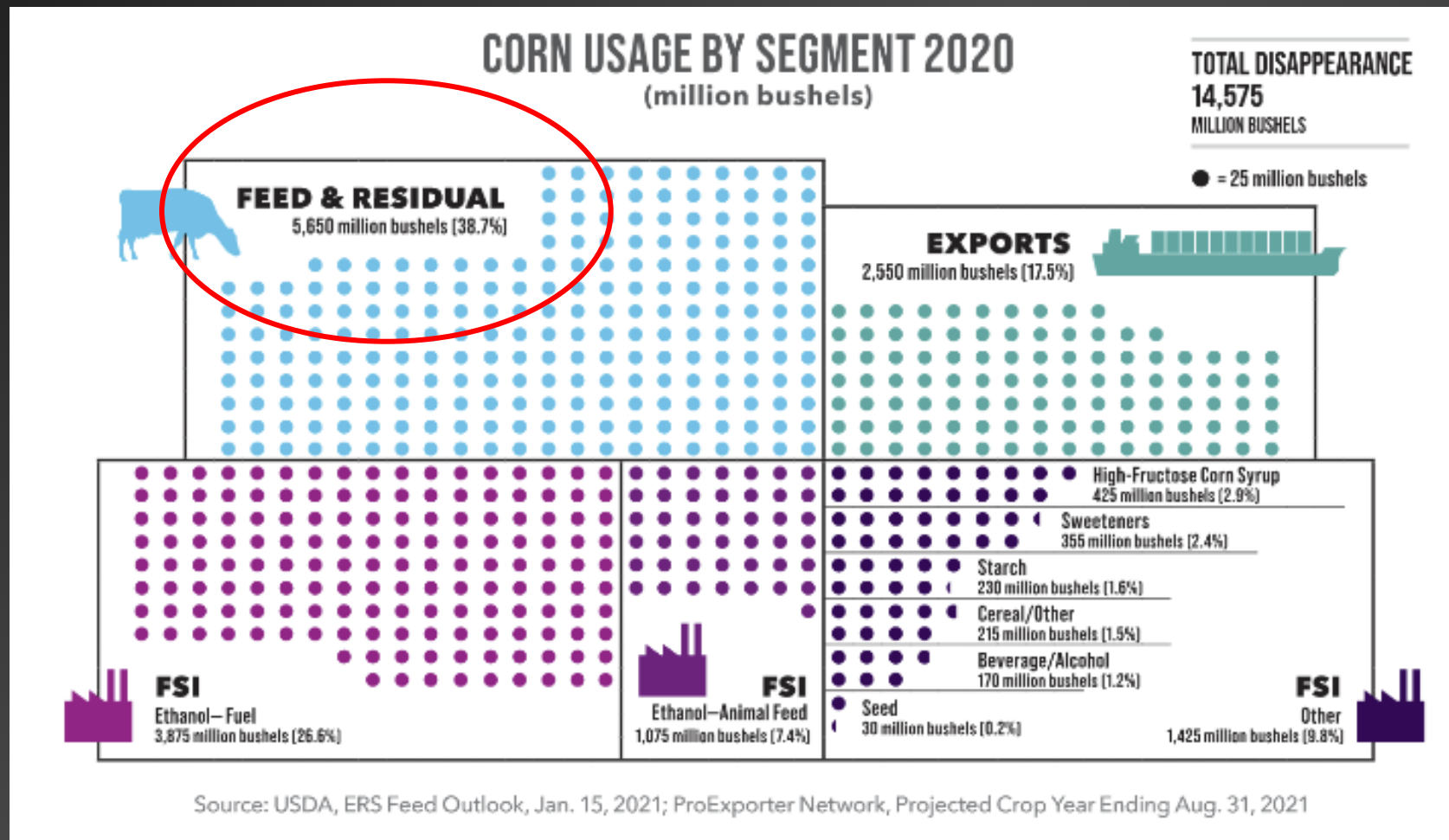
Higher-protein soybean meal increases corn demand:

↑ 5.2%

in pork production

↑ 13.8%

in broiler production



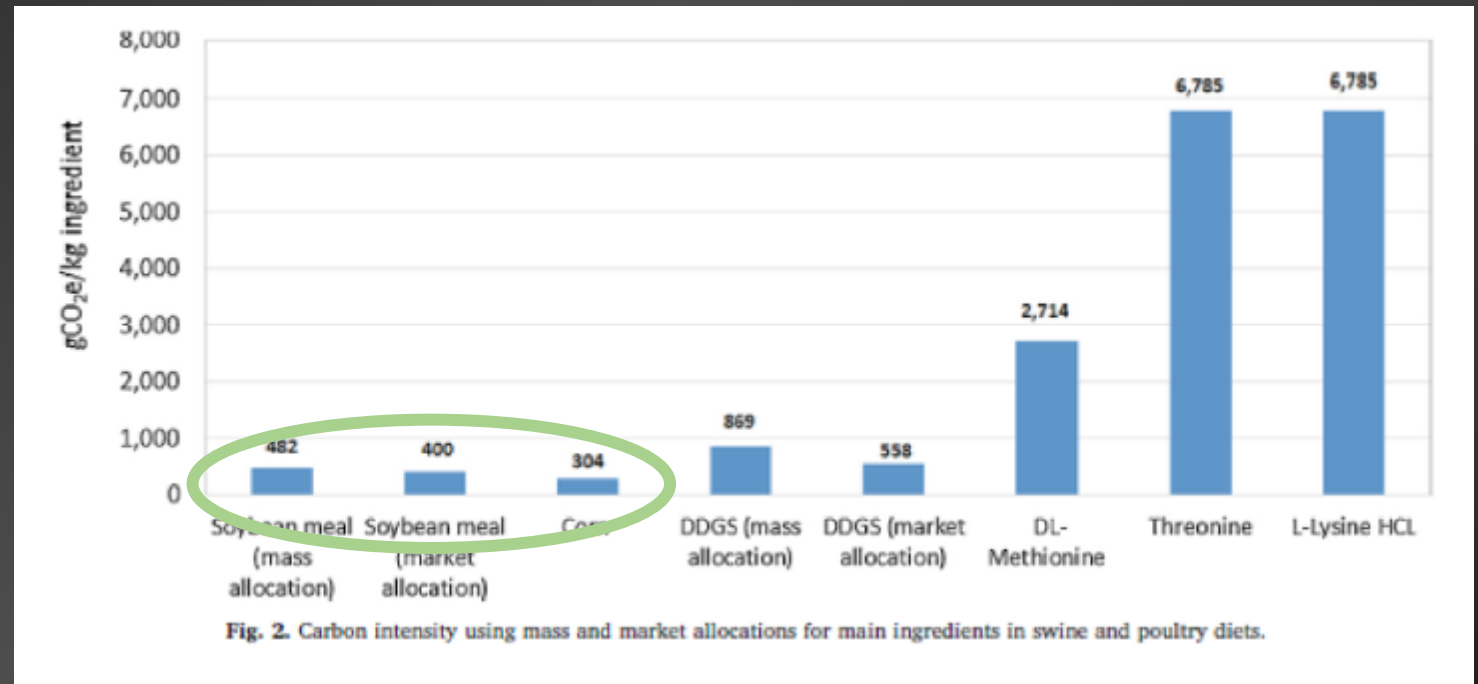
Preliminary corn demand estimates based on public and commercial nutrition data.
Source: Dr. Paul Mitchell, Dr. Bart Borg, Dr. Dean Boyd, Dr. Shawn Conley, John Osthus. Chart source: NCGA website.

Natural Feed Naturally Reduces Emissions

- *Share of monogastric emissions* from feed = ~90 %
- GHGs and energy use *decrease with natural feed*
- Examining Soy protein deltas creates *an ecosystem opportunity*

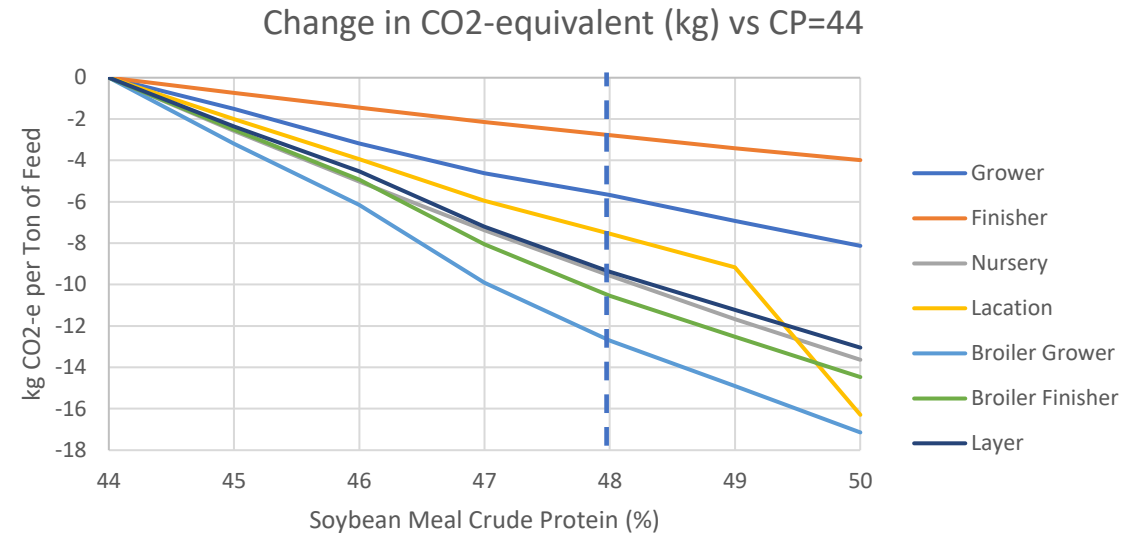
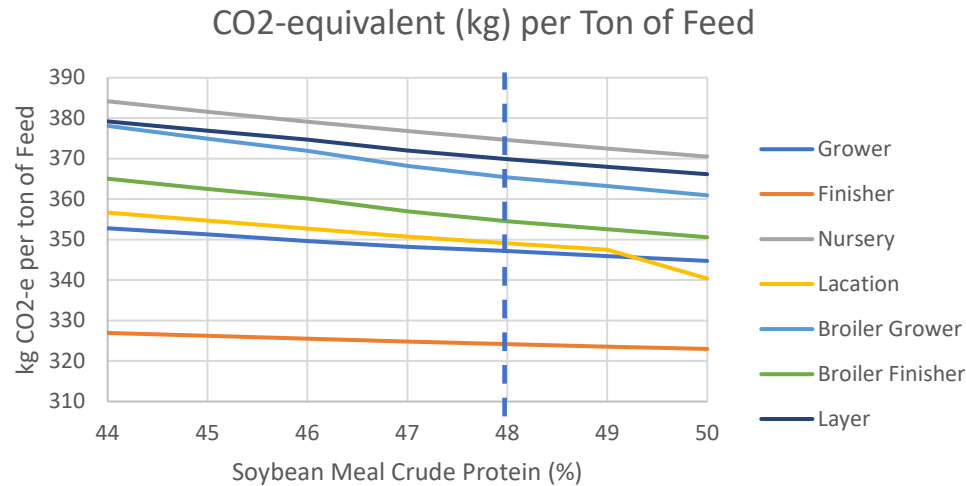
Natural feed:

- Less carbon intensity
- Reduce energy requirements



Pahola Thathiana Benavides, Hao Cai, Michael Wang, Nick Bajjalieh, "Life-cycle analysis of soybean meal, distiller-dried grains with solubles, and synthetic amino acid-based animal feeds for swine and poultry production," *Animal Feed Science and Technology*, Volume 268, 2020, 114607, ISSN 0377-8401, <https://doi.org/10.1016/j.anifeedsci.2020.114607>

Soybean Protein in Swine and Poultry Diets Decreases GHG Emissions



- 44% CP compared to 50 % CP In ACTUAL IOWA PIG DIETS:
 - % delta CO2-eq: - 11.5
 - % delta Nitrogen - 7.9

Sources: Mourtzinis et al; Benavides et al; Dr. Paul Mitchell, Dr. Bart Borg, Dr. Dean Boyd, Dr. Shawn Conley, John Osthus; Public and commercial nutrition data.

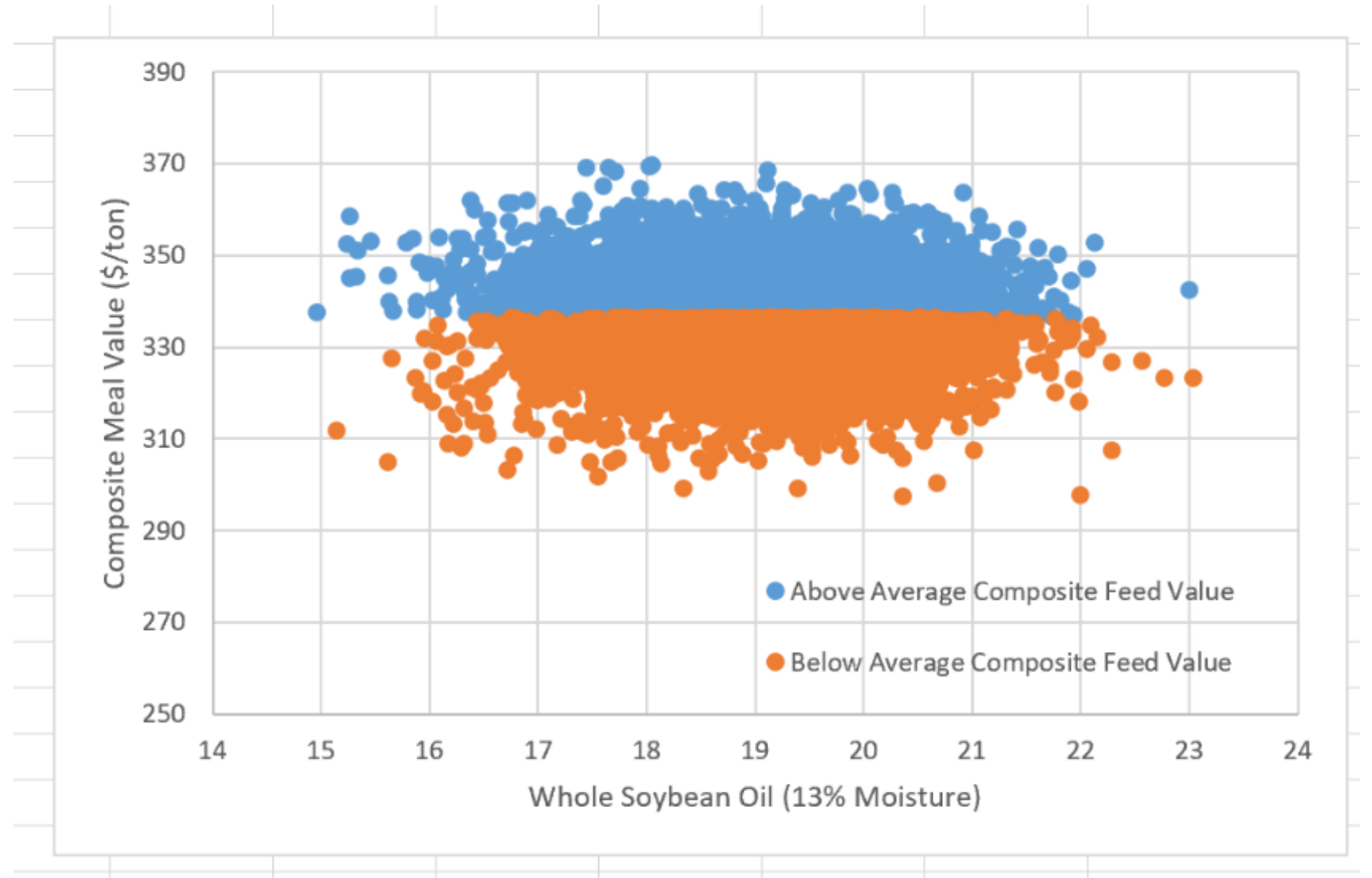
Protecting Water Quality



Ingredient	CP, %	Nitrogen, %
Corn	7.5	1.20
Corn DDGS, low oil	27.5	4.40
Soybean meal, 44%	43	6.88
Soybean meal 48%	47	7.52
L-lysine	78	12.48
DL-methionine	98	15.68
L-threonine	98	15.68
L-tryptophan	98	15.68

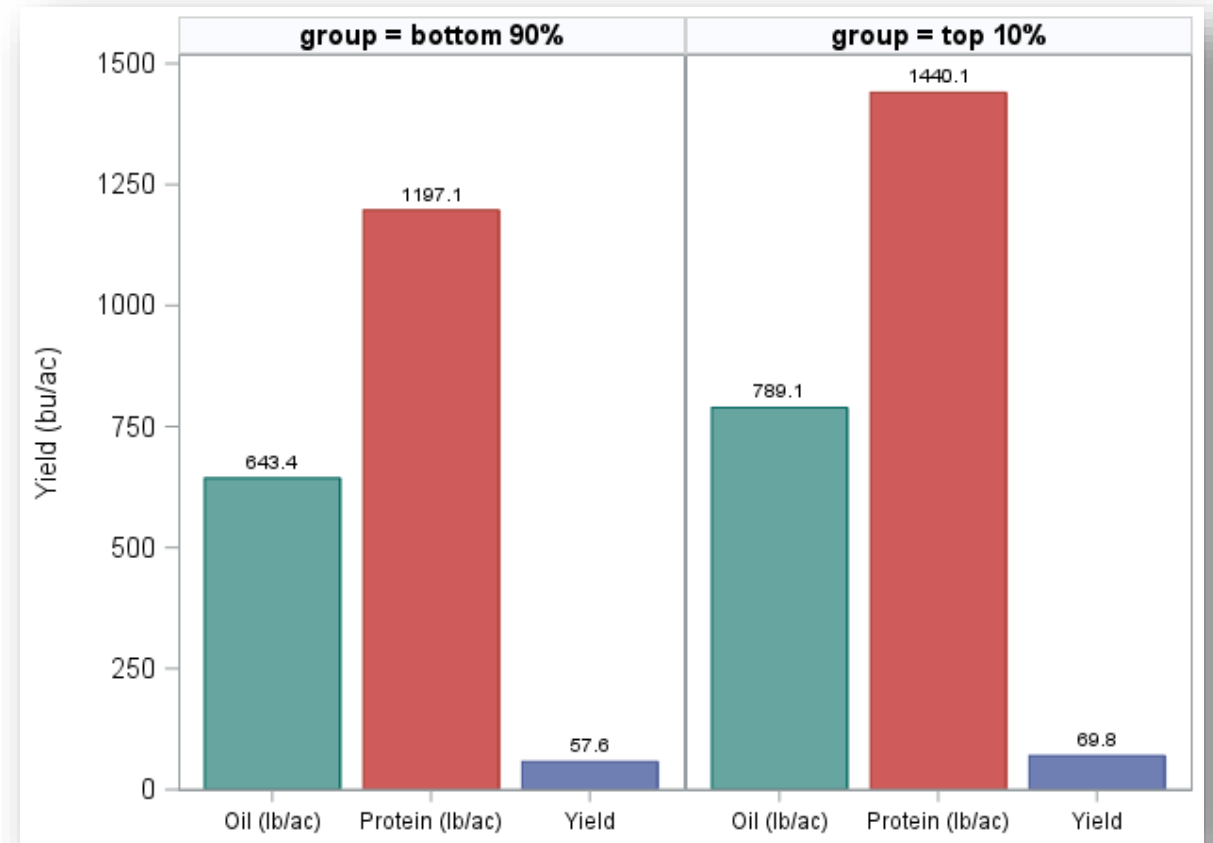
Sources: Hans Stein, University of Illinois

Managing Oil and Feed Value



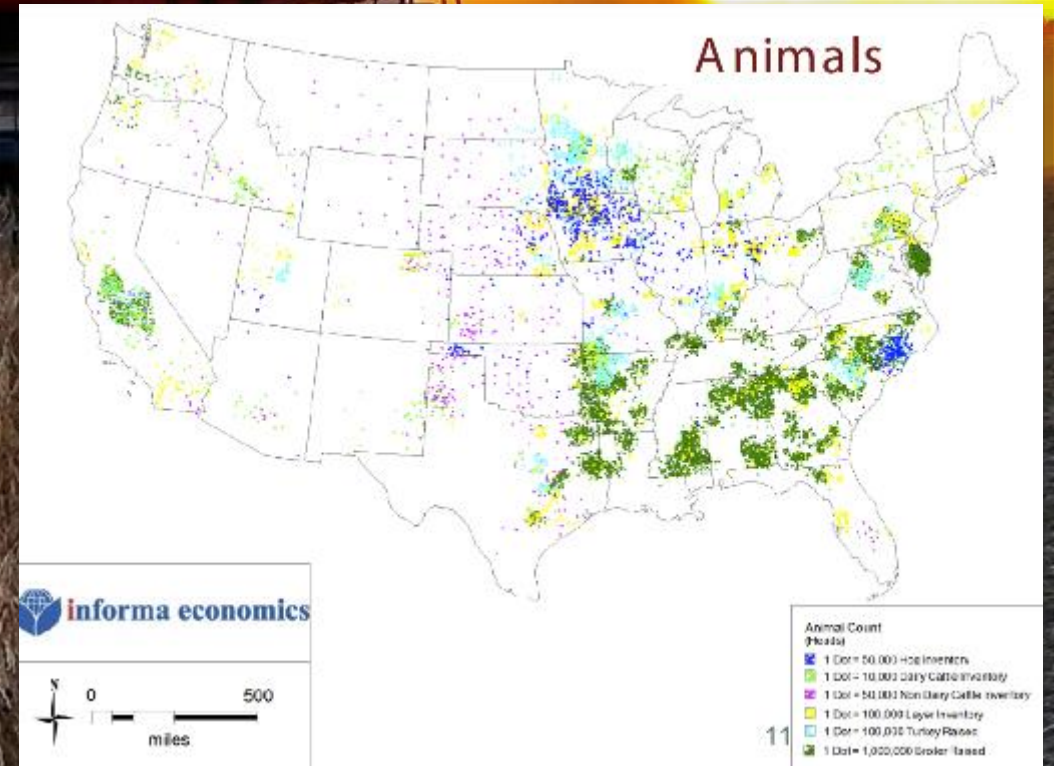
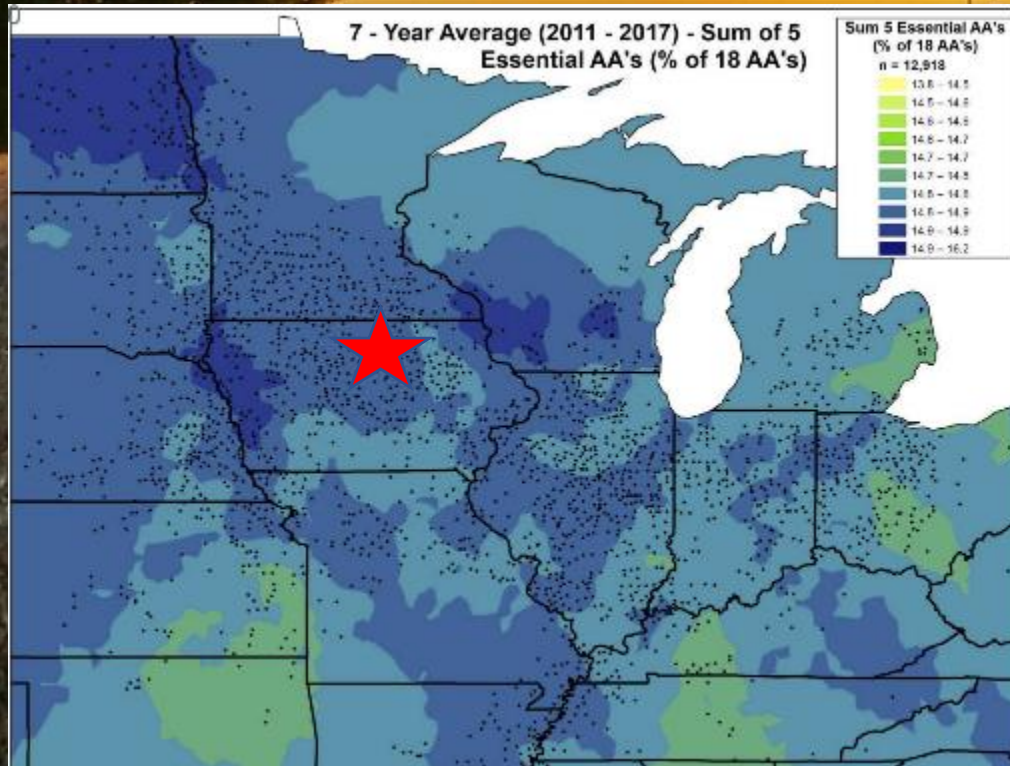
Improved Education Brings Benefits Everyone

- More soybean oil and/or protein value per acre
- Lower feed cost
- Improved health and performance
- More corn demand
- Less GHG intensity
- Less water pollution
- More sustainable food and energy
- Builds new bridges between political bedfellows



Significant Yield, Protein and Oil Hide in Top Varieties

Mimicking Nature with Geographic Targeting



Navigate

Select a country

Access PDF reports

Download an analysis

Covid-19 statistics by country income group

Covid-19 Alerts

Countries with ≥ 400 cases /100,000 in the last 14 days.

Conflict Alerts

Countries with ≥ 1 fatality /200,000 in the last 30 days.

Climate Alerts

% of people living in areas with significant rainfall or vegetation deficit $> 15\%$

% of people living in areas with significant excess rainfall $> 15\%$

0.62B

Total number of people with insufficient food consumption

16

Number of countries with very high levels of hunger

Prevalence of insufficient food consumption

Very Low	Low	Moderately low	Moderately high	High	Very high
0-5%	5-10%	10-20%	20-30%	30-40%	Above 40%

Hazards



Conflict



Undernourishment



Current Food Consumption



Vegetation



Rainfall

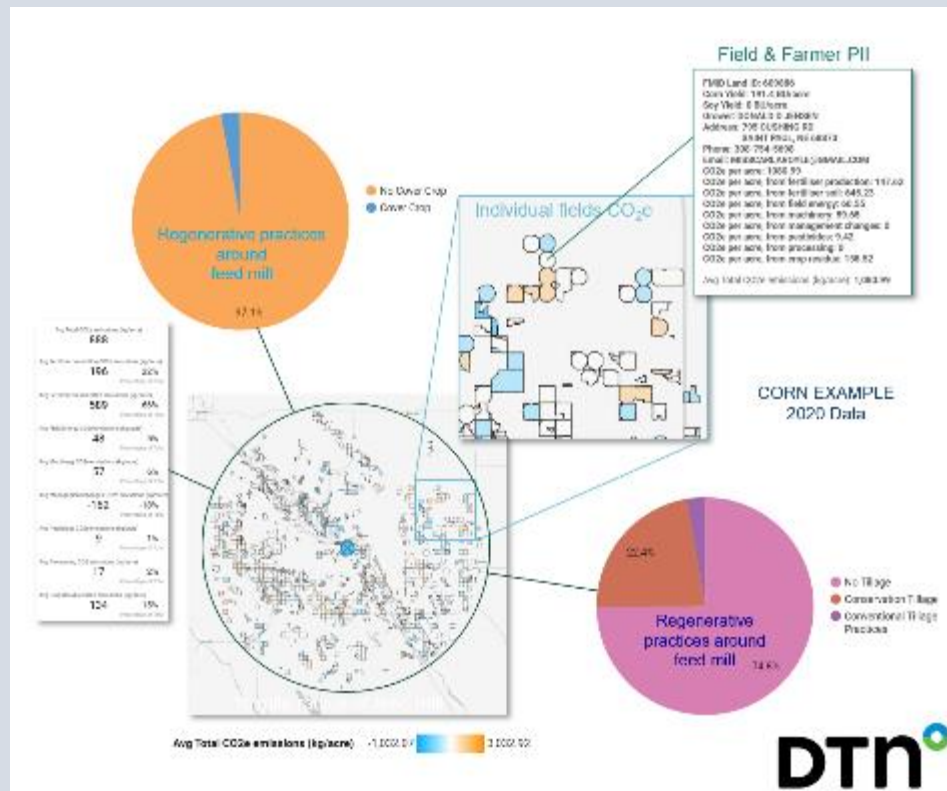


IPC/CH

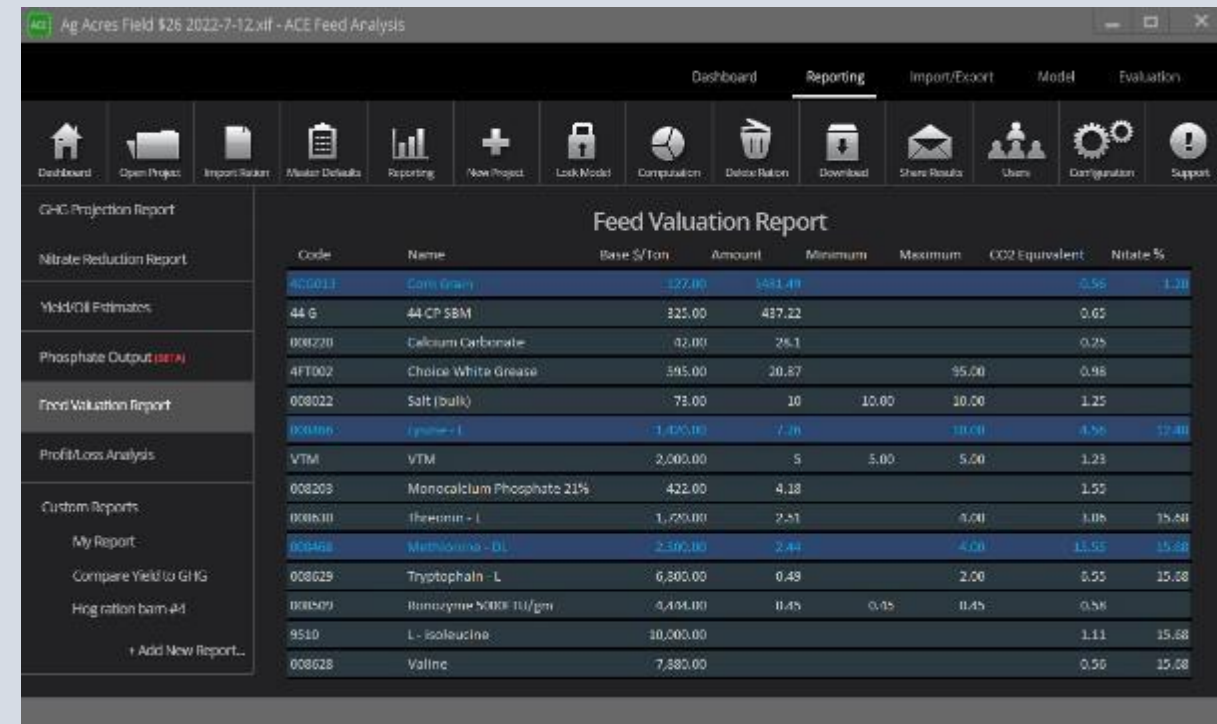


Improved Field Practice Measurement

Field Data on Tillage, Cover Crops, and Carbon Savings



Feed Software Documents Field-to-Feedlot Ecosystem Deltas



Accurate Outcome Measurement

Livestock Diet Software Delivers Output Files

Use Base Price As Fed Dry Matter
 Weight (Lbs.): 2,000.00 1,739.12
 Base \$/Ton 180.72 207.83
 Adjusted \$/Ton 180.72 207.83

Select Model: <None>
 Animal Specs Evaluation
 Input/Compare Projection

Feed Intake Requirement:
 Minimum: 2,000.00 Maximum: 2,000.00

Ration Concentration: 86.96 Analysis Basis:

Make Available **Feasible**
 Make Unavailable

Hide Unavailable Ingredients

Is Available	Code	Sub Rat	Name	Base \$/Ton	Mix Item	Amount	Minimum	Maximum	Shadow Price
<input checked="" type="checkbox"/>	4CG013/		Corn Grain	127.00	<input type="checkbox"/>	1,563.53			
<input checked="" type="checkbox"/>	50 G		50 CP SBM	325.00	<input type="checkbox"/>	372.67			
<input checked="" type="checkbox"/>	008220		Calcium Carbonate	42.00	<input type="checkbox"/>	28.53			
<input checked="" type="checkbox"/>	008022		Salt (Bulk)	73.00	<input type="checkbox"/>	10.00	10.00	10.00	
<input checked="" type="checkbox"/>	008466		Lysine - L	1,420.00	<input type="checkbox"/>	7.49		10.00	
<input checked="" type="checkbox"/>	VTM		VTM	2,000.00	<input type="checkbox"/>	5.00	5.00	5.00	
<input checked="" type="checkbox"/>	008203		Monocalcium Phosphate 21%	422.00	<input type="checkbox"/>	4.38			
<input checked="" type="checkbox"/>	4FT002		Choice White Grease	595.00	<input type="checkbox"/>	2.54		95.00	
<input checked="" type="checkbox"/>	008630		Threonine - L	1,720.00	<input type="checkbox"/>	2.53		4.00	
<input checked="" type="checkbox"/>	008468		Methionine - DL	2,500.00	<input type="checkbox"/>	2.35		4.00	
<input checked="" type="checkbox"/>	008629		Tryptophan - L	6,800.00	<input type="checkbox"/>	0.53		2.00	
<input checked="" type="checkbox"/>	008509		Ronozyme 5000FTU/gm	4,444.00	<input type="checkbox"/>	0.45	0.45	0.45	
<input checked="" type="checkbox"/>	9510		L-Isoleucine	10,000.00	<input type="checkbox"/>				
<input checked="" type="checkbox"/>	008628		Valine	7,880.00	<input type="checkbox"/>				4,207.95

Feed Software Documents Revenue and Ecosystem Deltas

Ag Acres Field #26 2022-7-12.xlf - ACE Feed Analysis

Dashboard Reporting Import/Export Model Evaluation

Dashboard Open Project Import Ration Master Defaults Reporting New Project Lock Model Computation Delete Ration Download Share Results Users Configuration Support

GIG Projection Report
 Nitrate Reduction Report
 Yield/Oil Estimates
 Phosphate Output (SEPA)
Feed Valuation Report
 Profit/Loss Analysis
 Custom Reports
 My Report
 Compare Yield to GIG
 Hog ration barn #1
 + Add New Report...

Code	Name	Base \$/Ton	Amount	Minimum	Maximum	CO2 Equivalent	Nitrate %
4CG013	Corn Grain	127.00	1,563.49			0.56	1.38
44 G	44 CP SBM	325.00	437.22				0.65
008220	Calcium Carbonate	42.00	28.1				0.25
4FT002	Choice White Grease	595.00	20.87		95.00		0.98
008022	Salt (bulk)	73.00	10	10.00	10.00		1.25
008466	Lysine - L	1,420.00	7.26		10.00	4.56	12.40
VTM	VTM	2,000.00	5	5.00	5.00		1.23
008203	Monocalcium Phosphate 21%	422.00	4.18				1.55
008630	Threonine - L	1,720.00	2.51		4.00		1.08 15.40
008468	Methionine - DL	2,500.00	2.44		4.00		11.55 15.28
008629	Tryptophan - L	6,800.00	0.48		2.00		0.55 15.38
008509	Ronozyme 5000 FTU/gm	4,444.00	0.45	0.45	0.45		0.58
9510	L-Isoleucine	10,000.00					1.11 15.58
008628	Valine	7,880.00					0.56 15.38

Our Requests

1. *Energize* the supply chain with a farm, food, and energy *ecosystem grant to increase quality and value* of soybeans.
2. Help secure funding for our team to spark *innovative ecosystem partnerships*.
3. Help ensure open access to quality field data is available to our team and the public to help the and livestock diets to *accurately measure feed and ecosystem value*.
4. Tell us how this discovery can help support USDA success.

An aerial photograph of a vast, plowed agricultural field. The soil is a rich, golden-brown color. The field is divided into numerous parallel furrows that recede into the distance, creating a strong sense of perspective. The furrows are deep and well-defined, with shadows cast within them. In the far distance, a thin line of green vegetation is visible against the horizon.

Questions / Discussion