

Value Task Force Objectives

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Value Task Force

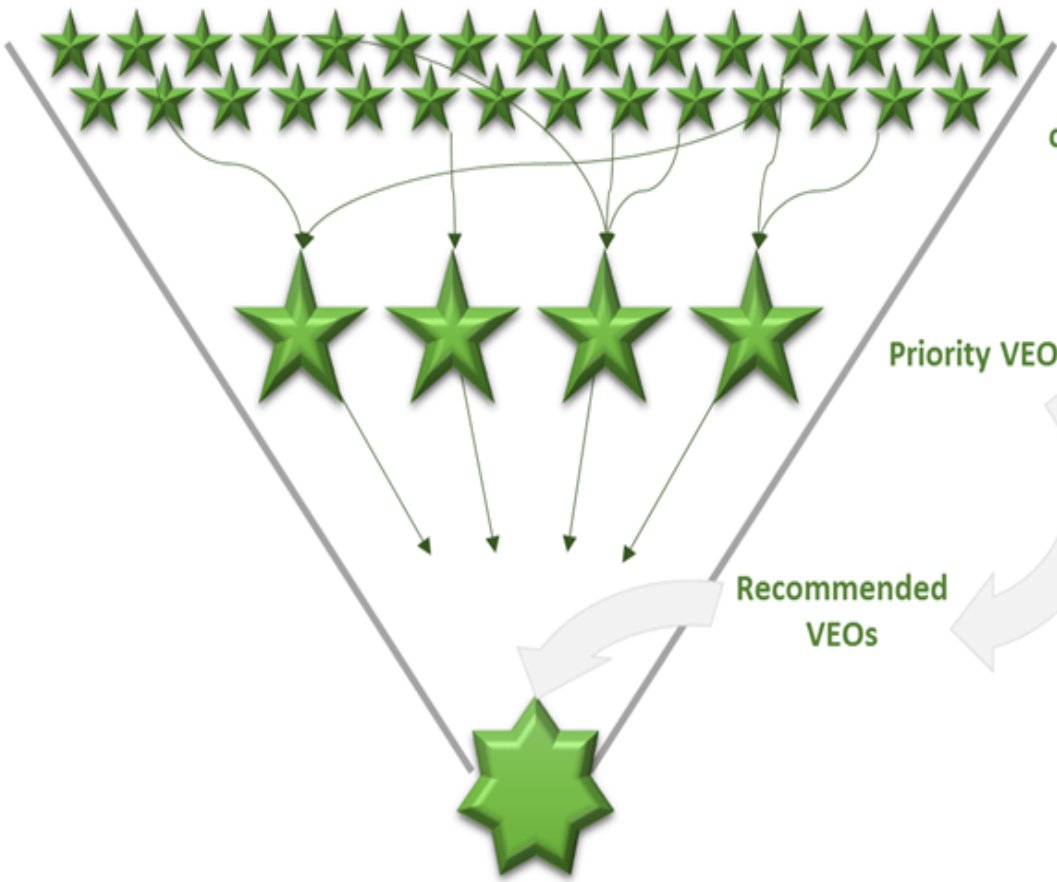
- Created December 2011
- Goal: Create value capture system for new and potential compositional traits
 - Support development of new traits that increase U.S. soy competitiveness
- Focus on market acceptance, transparency and measurement capability
- VTF will sunset in March, Pass to USB AT and Qualisoy



2012
2013
2014

History and State of Industry (Purdue/Mississippi State)

Mechanisms for value enhancements
Genetic Technology Mkt. Transformation



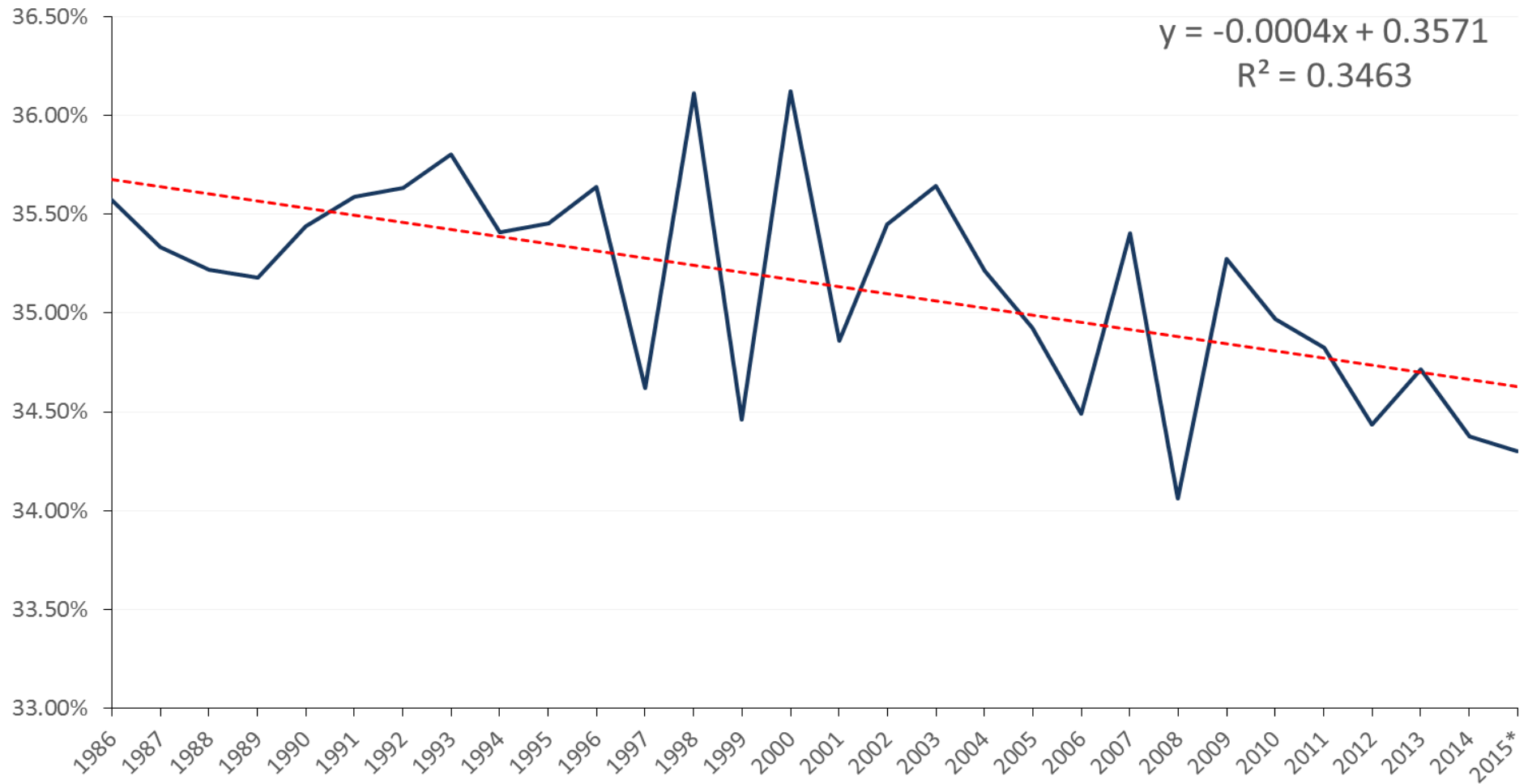
Broad list of VEO concepts
Foundation Research

Priority VEOs
Industry Engagement Meetings

Recommended VEOs



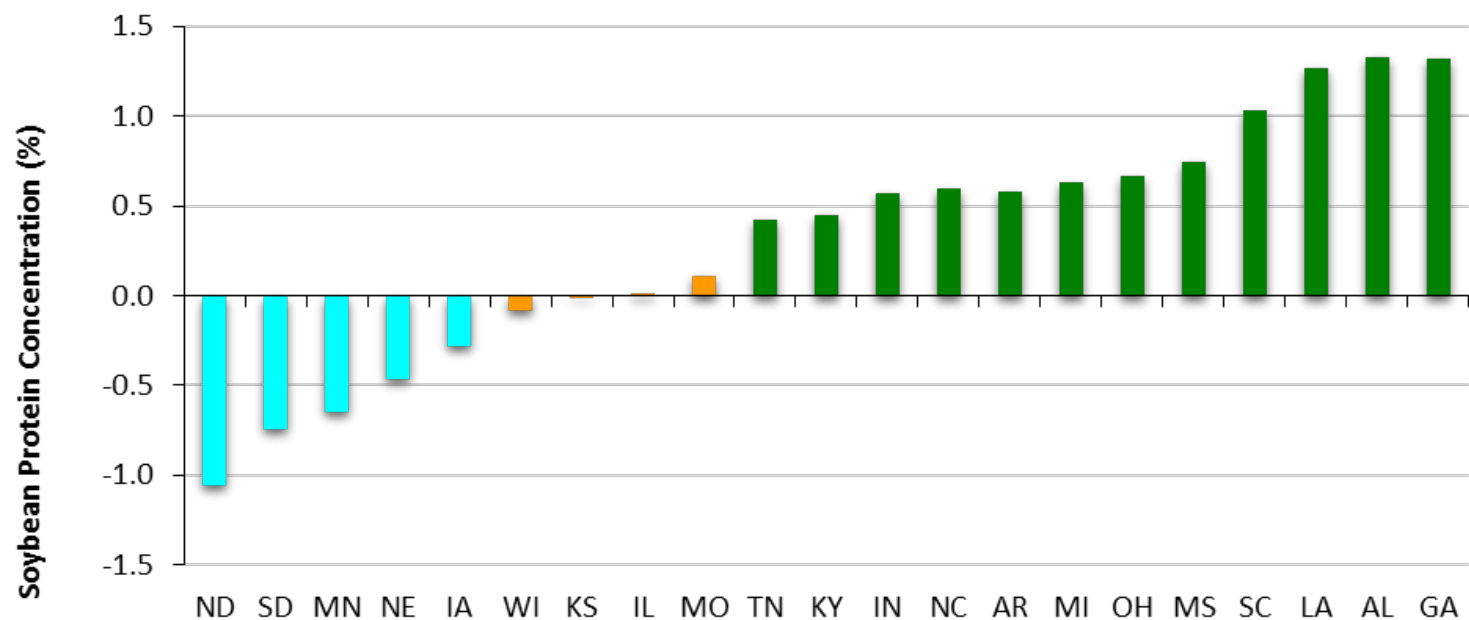
Historical Soybean Protein (13% moisture basis) 1986-2015



Do Nothing Analysis

Protein Region Classification

States were classified to protein regions based on historical protein levels. The bar chart below provides the number of standard deviation from the national average based on historical data from 1986-2014. This system enabled a higher-resolution view of soybean quality outcomes when compared to national quality outcomes alone.



Regional Projections of Oil and Protein

Do-Nothing Scenario

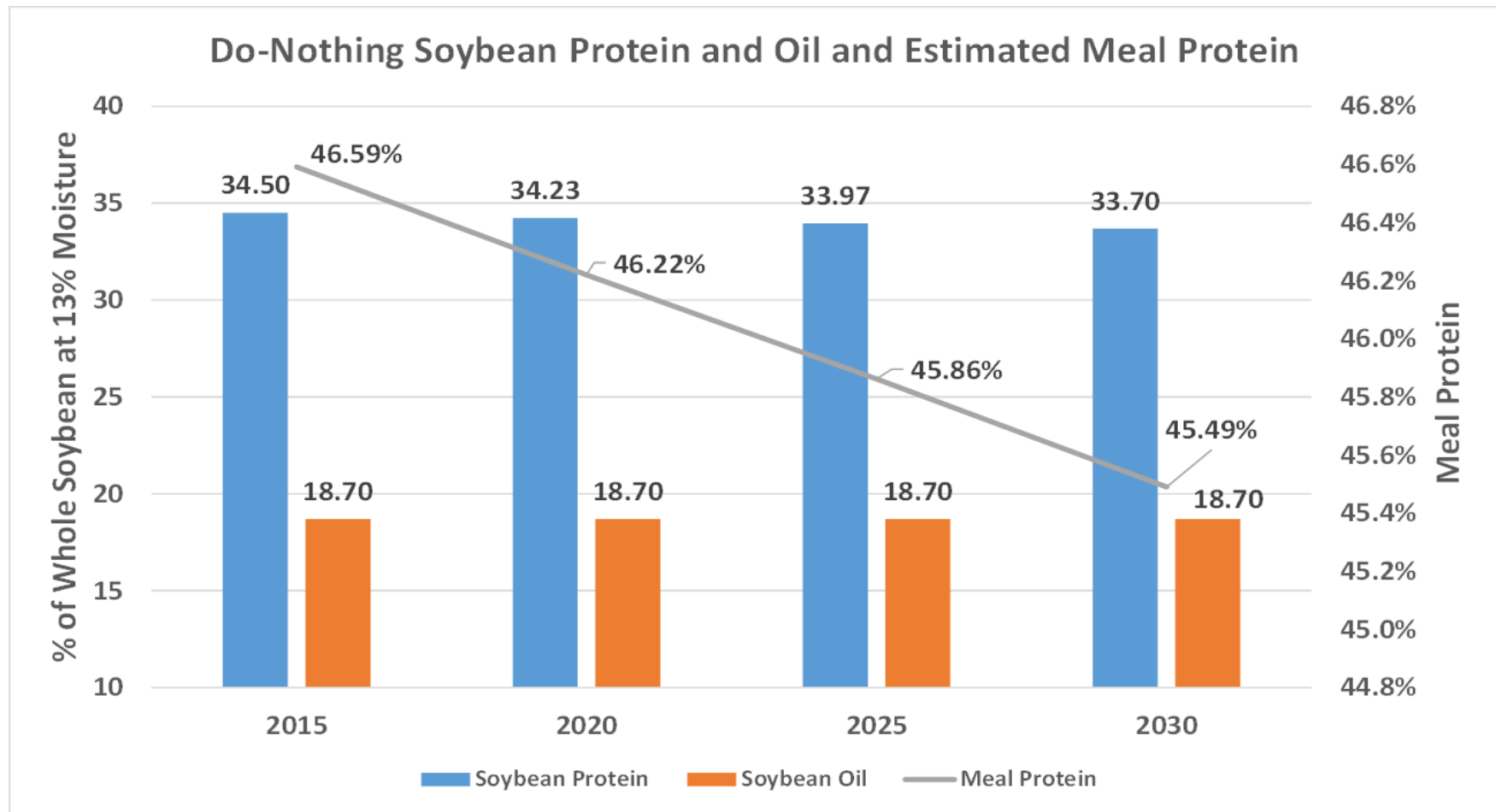


| Protein | 2015 | 2020 | 2025 | 2030 |
|----------|--------|--------|--------|--------|
| Low | 34.15% | 33.93% | 33.72% | 33.50% |
| Moderate | 34.50% | 34.23% | 33.97% | 33.70% |
| High | 34.95% | 34.62% | 34.28% | 33.95% |
| National | 34.50% | 34.23% | 33.97% | 33.70% |

| Oil | 2015 | 2020 | 2025 | 2030 |
|----------|--------|--------|--------|--------|
| Low | 18.85% | 18.85% | 18.85% | 18.85% |
| Moderate | 18.80% | 18.80% | 18.80% | 18.80% |
| High | 18.55% | 18.55% | 18.55% | 18.55% |
| National | 18.70% | 18.70% | 18.70% | 18.70% |



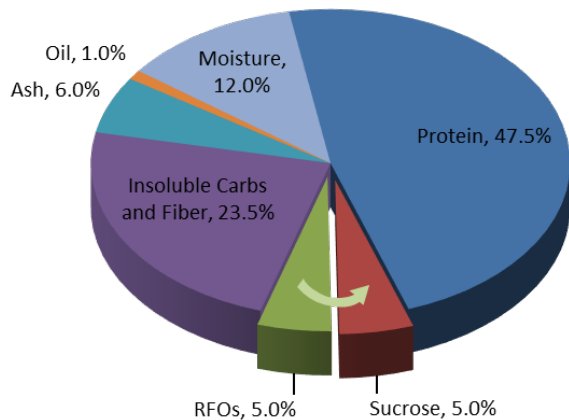
Soybean Oil-Protein Projections



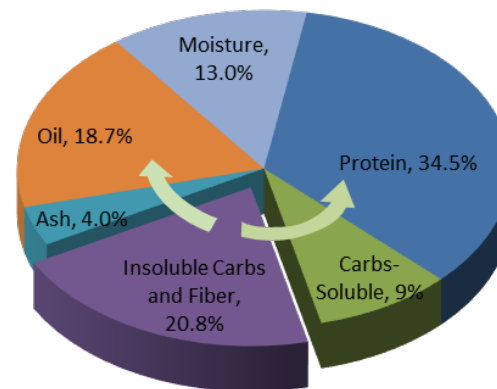
Target VEOs (Value Enhancement Opportunities)



Constituent Pricing

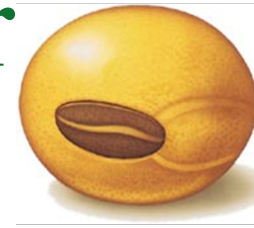


Enhanced Nutritional Energy Meal



Reduced Carbohydrate Soybeans

Constituent Pr



| | |
|-------------|-------|
| Oil | \$xxx |
| Protein | \$xxx |
| Amino Acids | \$xxx |
| Energy | \$xxx |
| Other | \$xxx |
| Total/bu. | \$XXX |

Effective constituent pricing systems will be key to enabling meal improvement strategies.

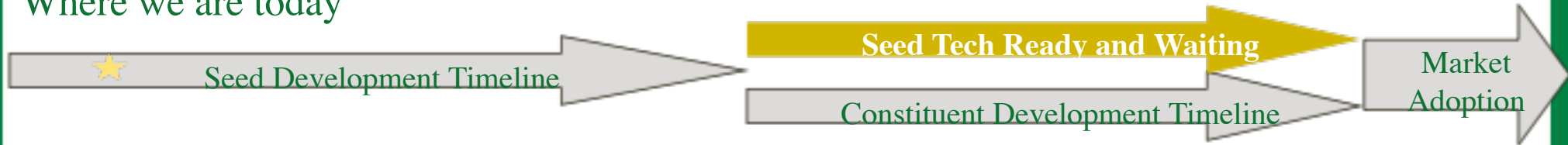
Recommendations:

- Study existing constituent pricing programs
- Engage nutritionists and ingredient buyers
- Engage measurement technology companies

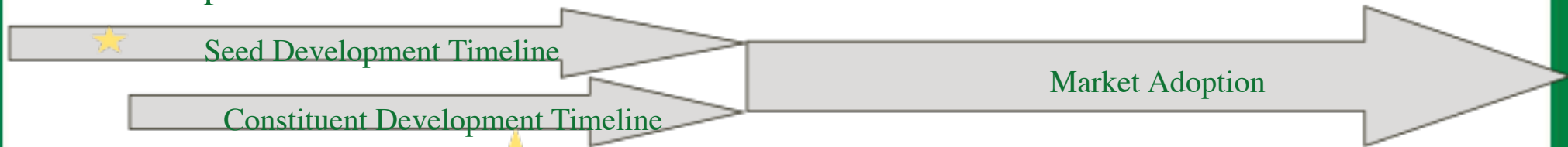


Constituent Pricing Value Proposition

Where we are today



If we anticipate market needs



Pilot Program

Going forward, rational constituent pricing capabilities encourage future investment for additional value enhancement.



Protocol and technology development

Scale up for market adoption

Constituent Pricing Proposed Recommendations



| | |
|-----------------|-------------|
| Oil | \$xxx |
| Protein | \$xxx |
| Amino Acids | \$xxx |
| Energy | \$xxx |
| Other | \$xxx |
| <hr/> Total/bu. | <hr/> \$XXX |

Pursue the development of pilot constituent pricing models aggressively

- Logic: constituent pricing is going to be necessary for whatever quality improvement strategies are taken going forward
 - Current diversity
 - ENEM
 - RCS
- Pilot models will:
 - educate the market,
 - define technological needs, and



Constituent Pricing

Capturing Value from Current

- Composition does vary significantly by variety

Can improve composition through plant selection



| | |
|-------------|-------|
| Oil | \$xxx |
| Protein | \$xxx |
| Amino Acids | \$xxx |
| Energy | \$xxx |
| Other | \$xxx |
| <hr/> | |
| Total/bu. | \$XXX |

- End-user relevant compositional variation exists in commercial lines

Near-term beneficial change is possible

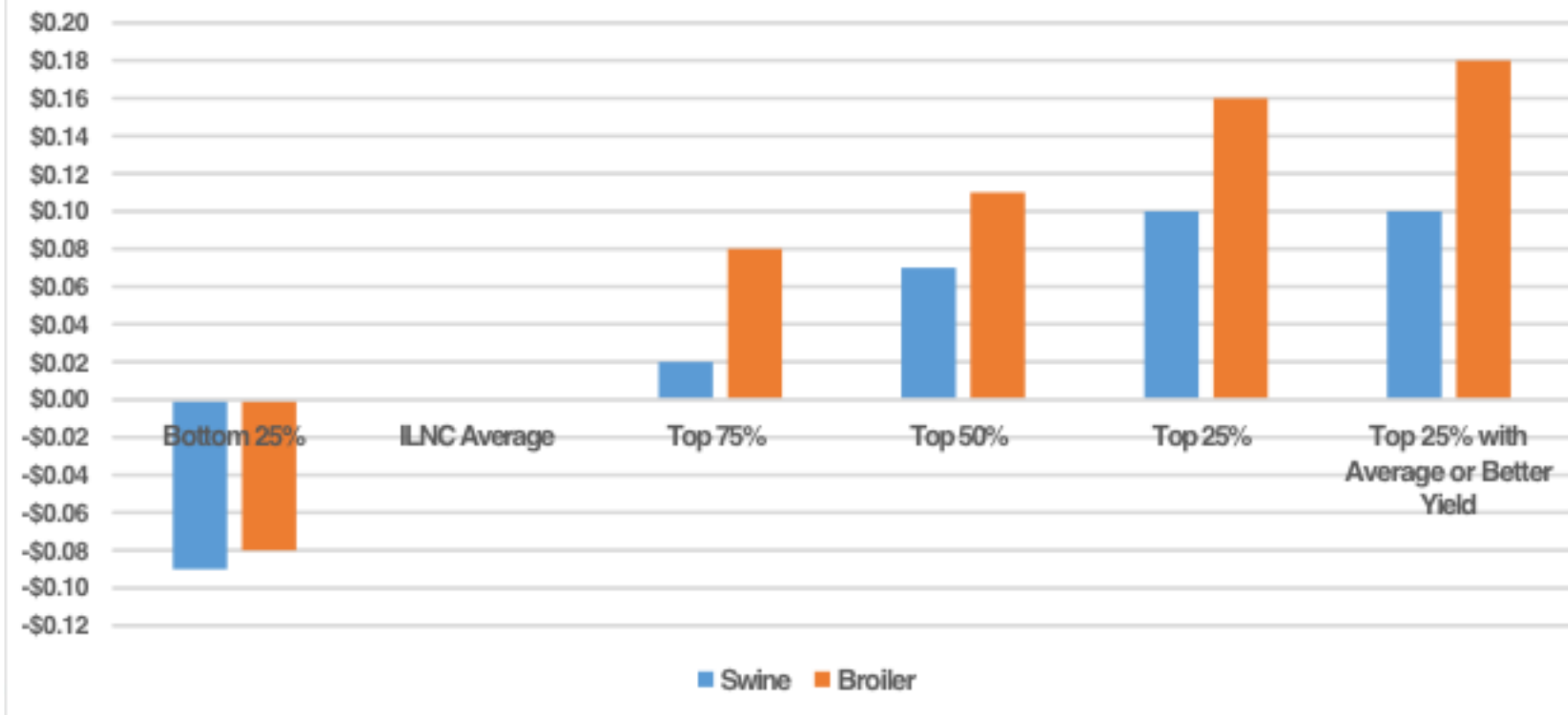
- Relationship between Yield and reported compositional characteristics tend to be weak

Can improve composition within the context of the ranges observed here without impacting yield



Constituent Pricing Capturing Value from Current Diversity

"Snapshot" Applied Gross Value Differences for ILNC Relative to Region Average, Ranking Based on Estimated Meal Lysine, \$/Bu Soybeans Calculated from Meal Values



unitedsoybean.org



Constituent Pricing

Proposed Recommendations



| | |
|-------------|-------|
| Oil | \$xxx |
| Protein | \$xxx |
| Amino Acids | \$xxx |
| Energy | \$xxx |
| Other | \$xxx |
| <hr/> | |
| Total/bu. | \$XXX |

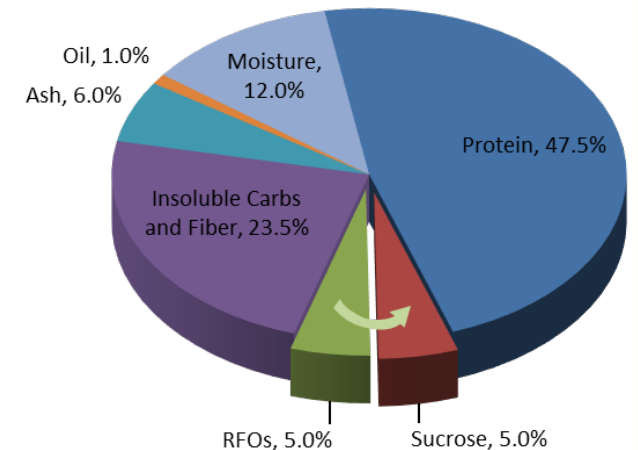
- USB formally commits ... and sets goals for the transition
- Assess role of constituent pricing for *current diversity*, ENEM, RCS
- Develop specific recommendations for different stages of adoption
- Engage with the appropriate authorities - impediments and support
- Convene the industry to develop specific standards
- Engage measurement technology companies
- Define and facilitate a sound pilot project
- Develop educational and awareness campaigns



Enhanced Nutritional Energy Meal

Shorter-term opportunity

Replaces non-digestible components with higher energy components

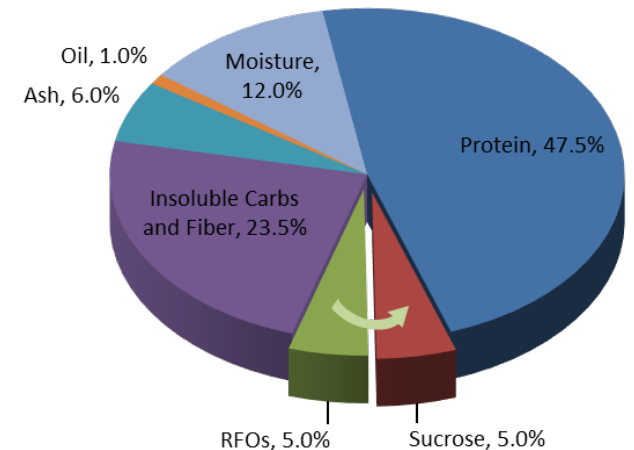


Recommendations:

- Assess performance gains and implied value
- Understand feasibility of stacking with high oleic varieties



Enhanced Nutritional Energy Meal



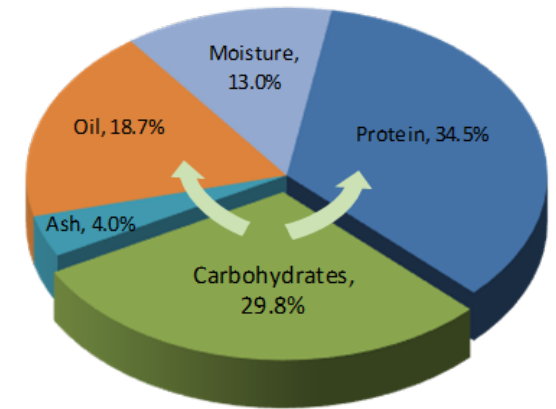
- Goal is <1% RFOs and 7-14% sucrose
 - A desired increase of 100 kcal/lb in metabolizable energy by increasing sucrose
 - Translates to approx. \$0.50/bu increase in value



Reduced Carbohydrate Soybeans

Longer-term opportunity

Carbohydrates are replaced by higher levels of oil and crude protein

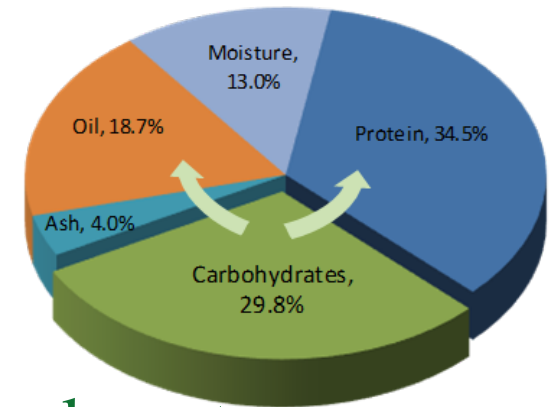


Recommendations:

- Engage USB investment to explore RCS platforms
- Establish minimum compositional changes needed to ensure sufficient market value for each sector



RCS VEO



Convert some insoluble carbs to oil and protein

RCS 3.0 = 3% unit increase in oil

RCS 2.1 = 2% unit increase oil, 1% unit increase protein

22% oil and 35% protein beans

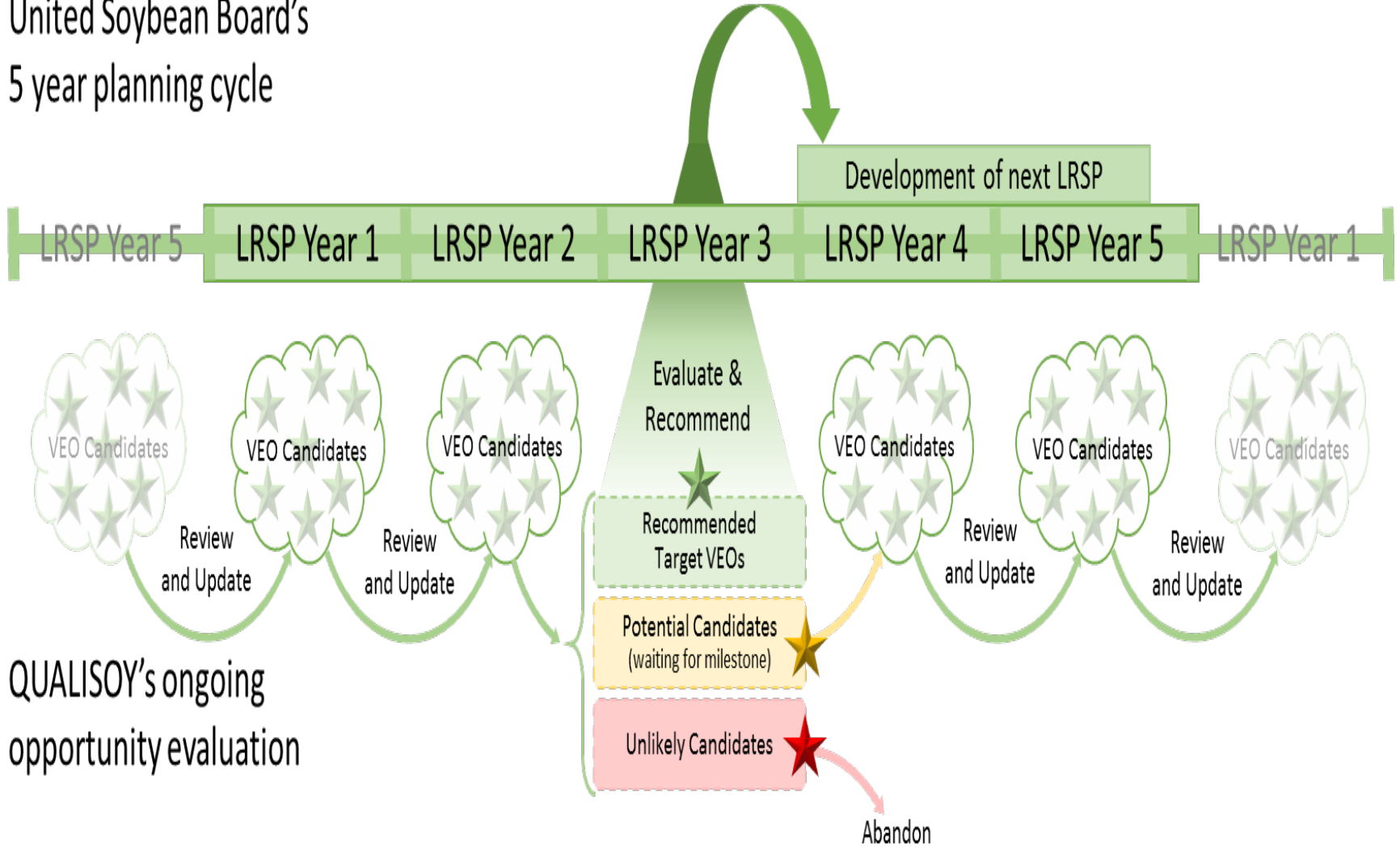
Results in 3% more oil from a bushel

Meal protein over 51%, but 3% less meal produced

No yield drag



United Soybean Board's 5 year planning cycle



QUALISOY's ongoing
opportunity evaluation

