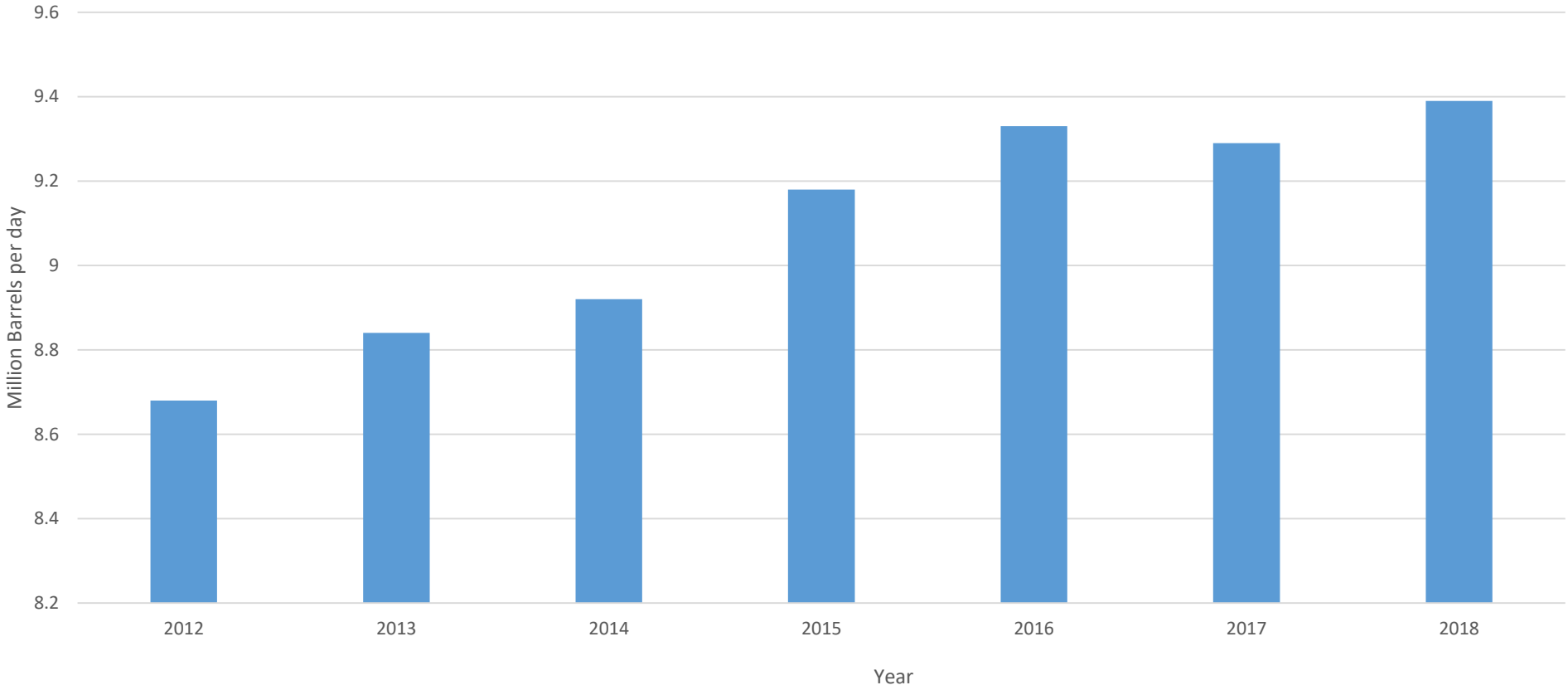
growth energy™
America's Ethanol Supporters

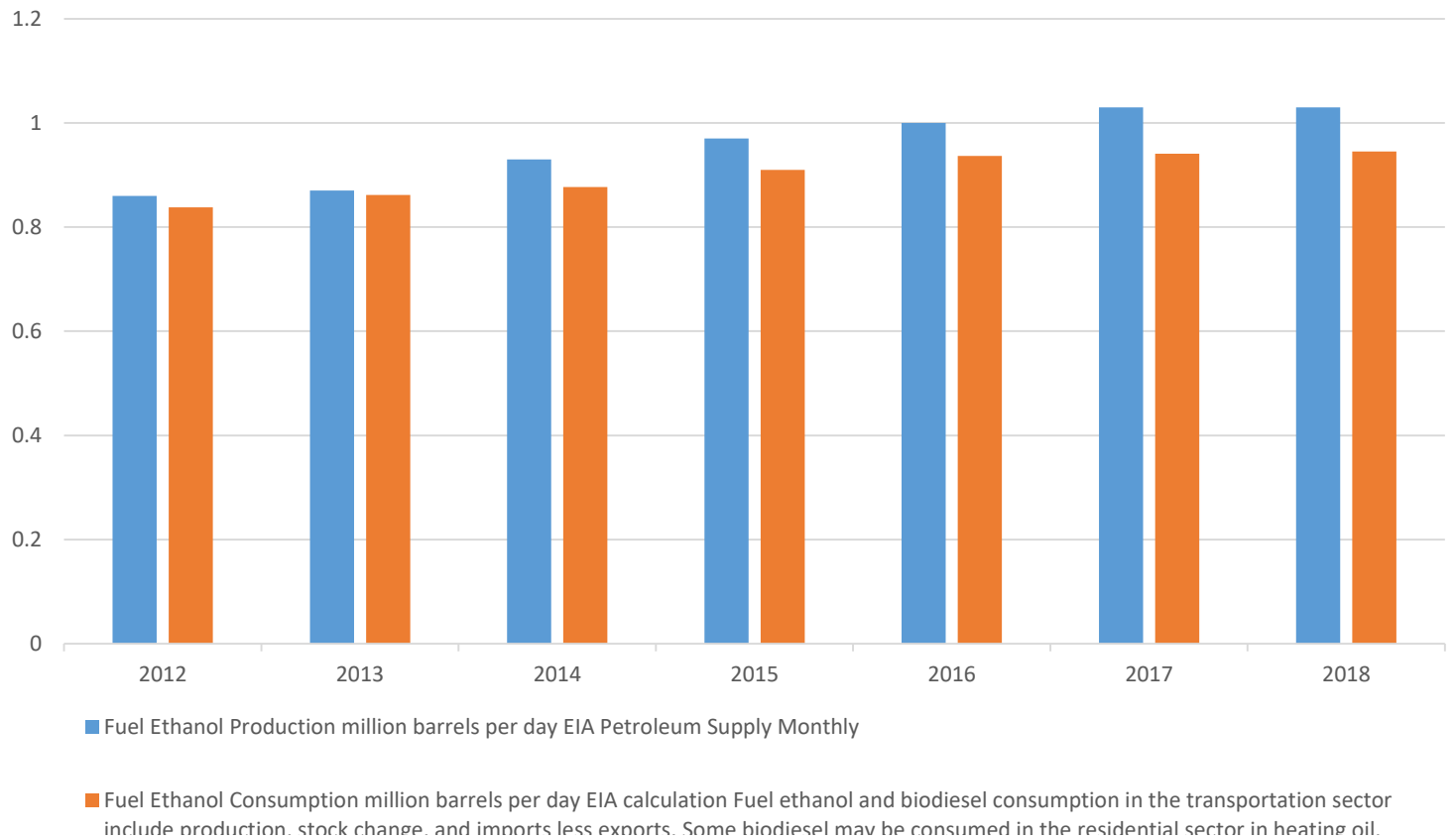
Regulatory and Compliance Update

Market Snapshot

U.S. Gasoline Demand (EIA)



Fuel Ethanol Production vs Consumption
Million barrels per day



E15 FOOTPRINT

803
LOCATIONS

29
STATES

EXPORT FLOWS FROM THE U.S.

ORIGINS & DESTINATIONS

Renewable Fuel Standard – DC Outlook

Trump Administration

What does it mean for ethanol?

- Supportive of the RFS and ethanol on the campaign trail:

  "We are going to protect the Renewable Fuel Standard, corn-based ethanol" – Candidate Trump at an Iowa Campaign Rally 9/13/16

  "Did you hear what he said during the campaign? Renewable energy, ethanol, is here to stay." – USDA Secretary Perdue at Couser Farm 5/4/17

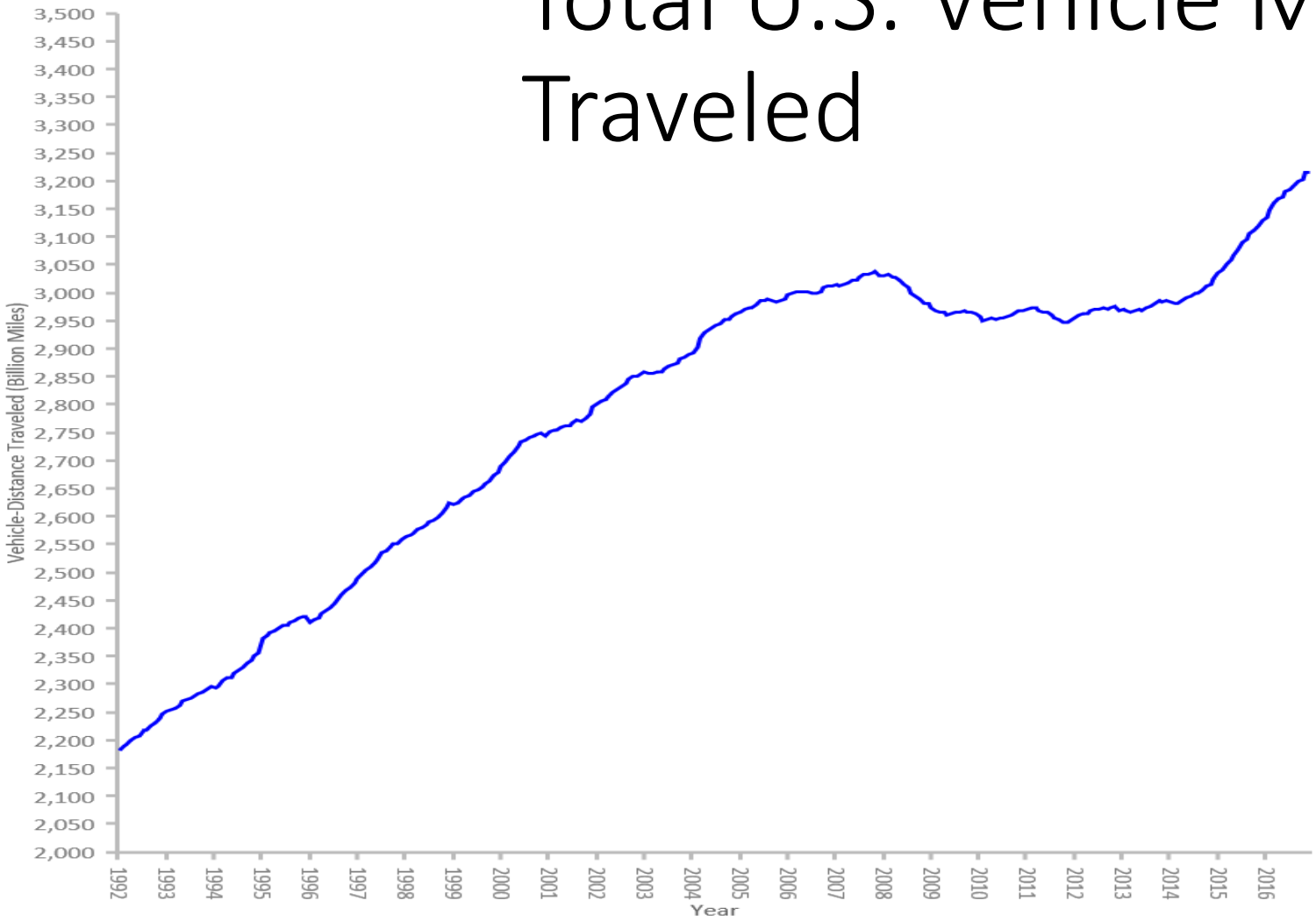
- No change or further delay of 2017 RVO – Into Effect on March 22nd
- 2018 RVO Proposal – At OMB, May/June
- 2014-2016 Litigation

2018
Renewable Volume Obligation

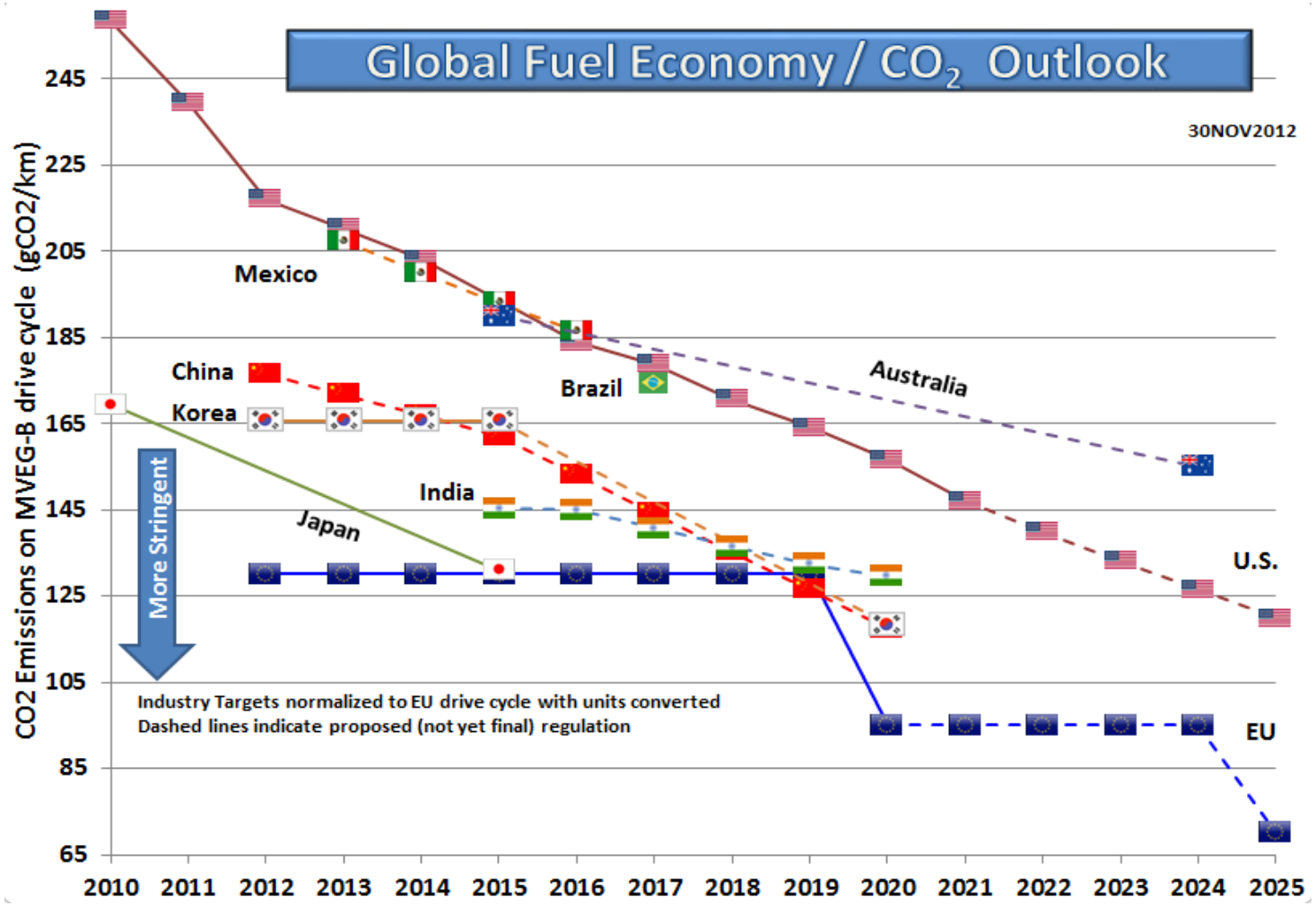
- <u>Statutory Numbers:</u>
    - 26 billion gallons total renewable fuel
        - 11 billion gallons advanced biofuel
            - 2.1 billion gallons biodiesel (already set in 2017 RVO)
            - 7 billion gallons cellulosic
            - 850 million other advanced
            - 15 billion gallons conventional ethanol

Autos and Midlevel Ethanol Blends

Total U.S. Vehicle Miles Traveled



Global Fuel Economy Standards Continue to Tighten



Automakers Want Higher Octane

HOT ROD | NEWS

Automakers to United States Government: Give Us High-Octane Gasoline or Give Us—Missed CAFE Goals?

"Higher octane is necessary for better engine efficiency," said GM's Nicholson. "It is a proven low-cost enabler to lower CO2. 100 RON fuel is the right fuel for the 2020-25

EPA explores mandating higher octane gasoline

ANY POTENTIAL GASOLINE REGULATIONS WILL TAKE A WHILE TO IMPLEMENT

AUGUST 24, 2016

GM, Ford R&D execs stress importance of improved, advanced fuels for future engine efficiency gains, GHG goals

3 April 2017

In separate presentations at the 2017 SAE High Efficiency IC Engine Symposium in Detroit, R&D executives from GM and Ford each stressed the importance of improved, advanced fuels—among other technology developments—for their future engine efficiency gains and for long-term CO_2 emissions goals.

David Brooks, Director for General Motors Global Propulsion Systems R&D located in Pontiac, gave a more medium-term perspective, emphasizing a pragmatic approach toward reducing CO_2 with an eye to 2025. Meeting regulatory targets while keeping vehicles affordable will require the synergistic integration of fuels and engine technologies, he noted.

According to Brooks, among the technologies GM is looking to in the gasoline engine area are:

- Continued aggressive downsizing. Key enablers are advanced boost systems and increased knock tolerance—meaning more knock-resistant fuels.
- Compression rations between 13 and 14 to maximize work extraction. Key enablers are active valve actuation and increased knock tolerance.
- Higher levels of dilution to enable EGR lean combustion at low temperatures. An enabler is more reactive fuels.

Brooks ticked off the requirements for future fuels in his talk:

1. High knock resistance with high sensitivity.
2. Low variability across the marketplace.
3. Near zero sulfur (<10 ppm)
4. Good low temperature catalyst reactivity.
5. Low propensity to soot.

We don't need new fuels, we need improved gasoline with high RON, high sensitivity and low variability.

—David Brooks

Growth Energy's Push for High Octane MLEBs

- 2012 – Growth Energy first to request a high-octane, E30 certification and in-use fuel to EPA and to California
  - Infrastructure Study (Stillwater) - $0.002-$0.005/gallon
  - Refinery Modeling (Mathpro) – wholesale savings $11B - $31B by 2035
- 2013 – Growth Energy Reiterates E30 request in EPA Tier 3 Standards
  - Final standard opens the door for E30 certification fuel
- 2016 – Growth Energy Reiterates Benefits of high-octane MLEB for CAFÉ/GHG Mid-Term Assessment
- 2017 – Growth Energy further comments to EPA in support of high-octane MLEBs
- 2017 – ASTM 100 RON (D8076) test fuel standard


Illinois Corn
ilcorn.org
ADM
INDIANA CORN Marketing Council
kycorn GROWERS ASSOCIATION
MinnesotaCorn GROWERS ASSOCIATION
IOWA CORN GROWERS ASSOCIATION
MissouriCorn PLANTING OPPORTUNITY
MONSANTO
Ohio Corn&Wheat
KANSAS CORN
MCGA MICHIGAN CORN GROWERS ASSOCIATION
Nebraska CornBoard
NATIONAL CORN GROWERS ASSOCIATION
25x25 AMERICA'S ENERGY FUTURE
JOHN DEERE
Ford Motor Company
GM
Mercedes-Benz
TOYOTA
Volkswagen
FCA FIAT CHRYSLER AUTOMOBILES
american coalition for ethanol
FUELFREEDOM CHEAPER. CLEANER. AMERICAN-MADE.
AAE
WG
RFA RENEWABLE FUELS ASSOCIATION
ICM the energy of innovation
growth energy America's Ethanol Producers
CFDC
POET HUMAN + NATURE
NACS National Association of Convenience Stores
energy future COALITION
BOYDEN GRAY & ASSOCIATES
GILBARCO VEEDER-ROOT
ERC ENERGY RESOURCES CENTER
clean air choice
AMERICAN LUNG ASSOCIATION. OF THE UPPER MIDWEST
Argonne NATIONAL LABORATORY
OAK RIDGE National Laboratory
Wayne FUELING SYSTEMS
EESI
Defour Group LLC
GOVERNORS' BIOFUELS COALITION
NREL NATIONAL RENEWABLE ENERGY LABORATORY
MAHLE
Driven by performance
UL
THORNTONS

Food Safety Modernization Act Compliance

Food Safety Modernization Act (FSMA)

- High-profile food contamination cases
- Enacted January 2011
- First Major Food Law since 1938
- FSMA gives FDA tools to monitor and control the food AND FEED safety of products both in and outside of the U.S.
- Key Components:
  - Risk-Based Preventive Controls
  - Inspection and Compliance
  - Imported Food Safety
  - Recall Authority

FSMA and the Ethanol Industry

- Final Rules September 2015
- Facilities that manufacture, process, pack, or hold animal food are required to register with the FDA
- Examples in the ethanol industry:
  - DDGs
  - Wet distiller grains
  - Corn oil

FSMA and Compliance

- Current Good Manufacturing Practices, Hazard Analysis, and Risk-Based Preventive Controls for Food for Animals
  - Very Small Businesses (Lengthy Definition): CGMP 9/17/2018; Preventive Controls 9/17/2019 (recordkeeping 1/1/2017)
  - Small Businesses (<500 FTE): CGMP 9/18/2017; 9/17/2018
  - Everyone Else: CGMP 9/19/2016; 9/18/2017
- FDA Compliance Resources:
  - http://www.fda.gov/Food/GuidanceRegulation/FSMA/
  - Draft Guidance for CGMPs

So What Does it Mean for an Ethanol Plant….

- Installation of standard operating procedures that ensure the production of safe, high-quality food for animals
- Key Components of a Plan:
  - Hazard Analysis
  - Preventive Controls
  - Supplier Verification Policy
  - Monitoring Procedures
  - Recall Policy
  - Corrective Action
  - Verification Procedures
  - Record Keeping Policy

Current Good Manufacturing Practices SOP Example:

- Personnel
- Plant, Grounds, and Sanitation
- Pest Control
- Water Supply and Plumbing
- Equipment and Utensils
- Plant Operations
- Preventive Control of Hazards
- Product Testing Program
- Warehousing and Distribution


AFQA®
ANIMAL FOOD QUALITY
ASSURANCE PROGRAM

Other Areas of Industry Interest

State Regulation Engagement

- Georgia: Ethanol ban
- New York: E10 Blending Cap
- Nevada: E10 Blending Cap
- California and Oregon LCFS
- Washington GHG program

Other Regulatory Engagement

- Rail: Railcar Standards and STB/Rate Issues
- International Market Development
  - USGC – Export Markets
  - Canadian Fuel and Feed Standards

Technical Support and Research

- Resources: Kmoore Consulting, Air Improvement Resources, Legal
- Tier 3 fuel compliance – 12/31/2016
- EPA MOVES Model/SAFE Fuels Research
  - SAE Paper on T70
  - UCR Testing Program
- ASTM – Broader participation, ethanol standard bundle
- Rail
- RFS/EPA Assistance

How Are We Going to Keep You Informed?

- Regulatory and Compliance Committee
- Regular Written Updates
- Webinars/Calls/Meetings

What Topics Are Important To You?