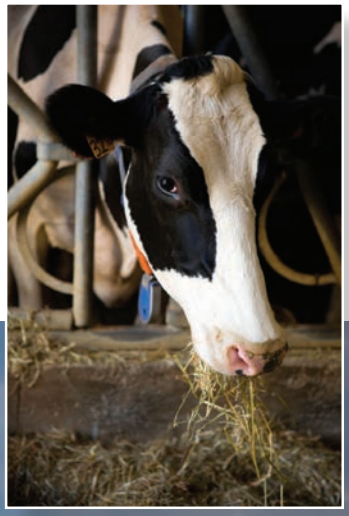
Snack and Fact:

BIOFUELS

Hosted by the American Society of Animal Science and the Alliance of Crop, Soil and Environmental Science Societies




Sustainable production of biofuels and associated costs, tradeoffs, and benefits has become a "hot topic". Scientists are working to optimize the role of biofuels and associated co-products in achieving energy security *and* high quality, affordable feedstuffs for livestock. Biofuels and livestock industries have been in direct competition for grain supply and in indirect competition for land to either produce grain or livestock. Intensification of livestock production systems, use of co-products, and shifts in meat demand could help moderate this competition in the future.

Biofuels are fuels that are generated from biological material and provide alternatives to fossil fuels.

- ✓ First-generation biofuels are ethanol and biodiesel and are generally produced from edible plants such as corn, sugarcane, or soybeans.
- ✓ Second-generation biofuels require a more complex conversion process and are produced from nonedible plants such as agricultural or forest residues or municipal waste. These are also called "cellulosic biofuels".
- ✓ Third-generation biofuels still face many technical challenges and include algal biomass.

Conversion of grains and oilseeds to first generation biofuels results in the production of **co-products** (non-edible for human consumption) that can be fed to cattle, pigs and poultry for conversion to high quality protein (meat, milk, and eggs) for human consumption. Including ethanol co-products in diets fed to livestock reduces but does not eliminate competition with humans for cereal grains.

- ✓ In the United States, the switch from livestock diets with increased levels of grain to diets containing high concentrations of co-products has been recent (within the last decade) and is directly linked to co-product abundance from production of biofuels and ingredient costs.
- ✓ There are challenges associated with feeding co-products to livestock, including but not limited to:
  - Nutritional properties of co-products vary greatly, and therefore, need to be precisely defined to optimize their use in livestock diets.
  - Contaminants of co-products such as mycotoxins and chemical residues need to be removed to avoid negative effects on livestock and meat quality.
  - High inclusion of some co-products in livestock diets increases polyunsaturated fatty acids and changes carcass composition.
  - Potential increases in nutrient excretion, nitrogen and phosphorus in particular, with high inclusion of co-products in livestock diets.

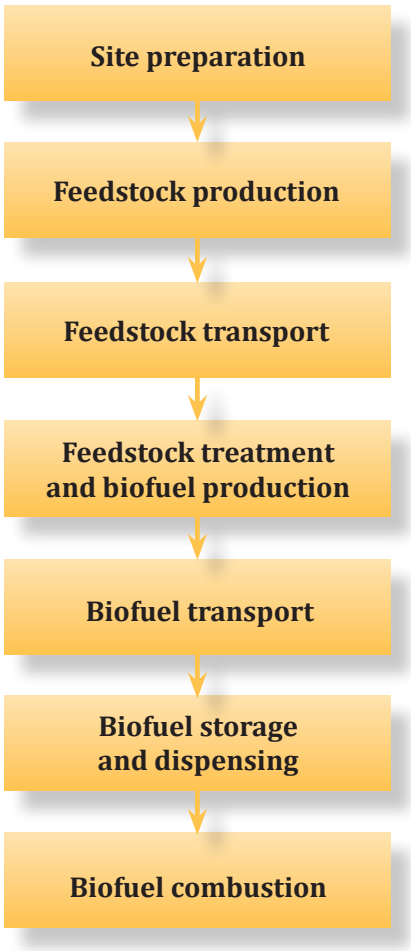
Challenges associated with feeding co-products to livestock can be mitigated, but not eliminated, by using modern feed formulation, feed evaluation, feed enzymes, and feed processing techniques.

Future Outlook

Livestock production has experienced a major shift toward intensification. As a result, livestock production requires less land. This trend is expected to continue. Within these systems, meat production from the most efficient converters of feed, poultry, and pork will grow faster than beef.

The biofuels boom and higher feed prices have slowed growth rates in the world's livestock sector. However, this effect is expected to diminish as production of ethanol from corn reaches a plateau, and we develop cost effective, qualitative feeding strategies for co-products. These future trends will help mitigate the debate surrounding "food versus fuel".

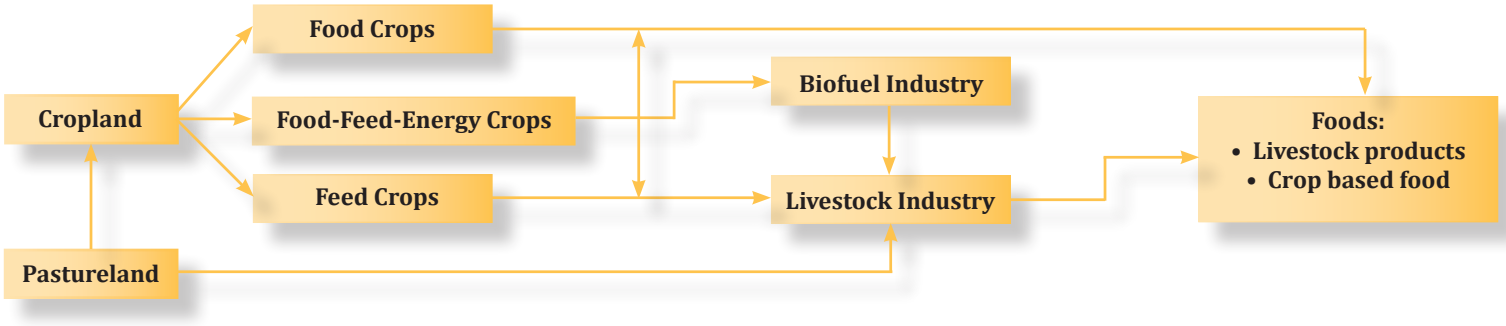
The seven stages of the biofuel life cycle



This material is associated with the following source:

Animal Frontiers
The review magazine of animal agriculture
http://animalfrontiers.org
April 2013, Volume 3, No. 2

Current Land Allocation Model



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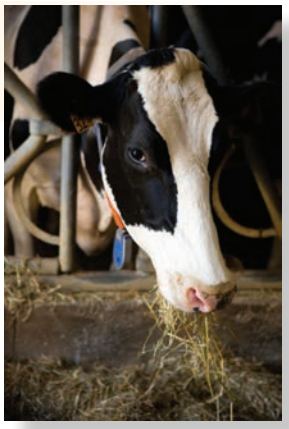
House Ag Committee
1300 Longworth House Office Building • Washington, DC
April 22, 2013

12:00 noon	**Welcome**	*Walt Smith and Lowell Randel; FASS Science Policy Directors*
12:05 pm	**Introduction & Goals**	*Meghan Wulster-Radcliffe; CEO, ASAS*
12:10 pm	**"Crop Production and Biofuels"**	*Dr. Sylvie Brouder (Purdue University)*
12:25 pm	**"How Livestock fit in the Biofuels Picture"**	*Dr. Galen Erickson (University of Nebraska-Lincoln)*
12:40 pm	**"Livestock Industry in Transition: Economic, Demographic, & Biofuel Drivers"**	*Dr. Wally Tyner (Purdue University)*
12:55 pm	**Wrap-Up and Discussion**	*Dr. Deb Hamernik; Chair, ASAS Public Policy Committee*
1:00 pm	**Adjourn**	



SPEAKERS

Dr. Wallace Tyner is an energy economist and James and Lois Ackerman Professor of Agricultural Economics, Purdue University. He has over 250 professional papers in these areas including three books and 90+ journal papers, published abstracts, and book chapters. In 2011, he served as Co-chair of the National Academy of Sciences Committee on Economic and Environmental Impacts of Biofuels.

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Dr. Sylvie Brouder is a professor in the Department of Agronomy at Purdue University. Her research focuses on crop nutrition and soil fertility. She is an expert on the relationships between cropping systems and the environment. In 2011, Brouder received a Certificate of Appreciation from the U.S. Department of Energy.

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Dr. Galen Erickson is an animal scientist and Nebraska Cattle Industry Professor of Animal Science and Beef Cattle Extension Specialist at the University of Nebraska-Lincolcn. His research focuses beef cattle feedstuffs and nutrition. He has investigated the quality of alternative feedstuffs like ethanol by-products. He has published 80 journal articles, 248 extension reports, 242 meeting abstracts and six book chapters.

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