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Reducing Feed's Environmental Footprint: Where Are the Opportunities?

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Environmental Footprint: Serving Our Customers

Indicators to Consider

Working with animal food industry members and stakeholders up- and down-stream in the supply chain, the Institute for Feed Education and Research (IFEEDER) developed a 'Sustainability Road Map' to support the U.S. animal food industry as it pursues continuous improvement on impacts important to industry members and their customers. For IFEEDER and the American Feed Industry Association (AFIA), sustainability is defined and managed by each individual organization to deliver measurable, continuous improvements on the impacts related to people, planet and governance that are most important to them and their stakeholders.

In conjunction with the road map, IFEEDER developed the animal food industry sustainability toolkit to provide insights and guidance for industry members seeking to initiate or advance their own internal sustainability efforts. Figure 1 represents the full feed value chain and those upstream (suppliers) and downstream of the feed industry. It clearly identifies whose efforts IFEEDER is supporting within the animal food industry as well as the stakeholders the animal food industry needs to engage and support.

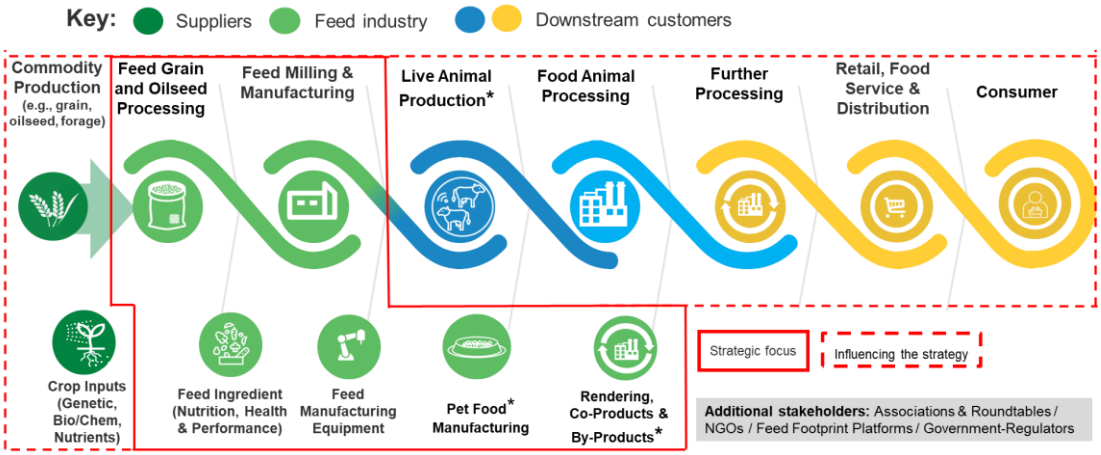


Figure 1. Animal food industry value chain.

To guide IFEEDER's efforts, indicators relevant to the U.S. animal food industry were analyzed for their occurrence within five animal production industry sustainability efforts: the Sustainable Dairy initiatives, the North American Meat Institute, National Pork Board, U.S. Roundtable for Sustainable Poultry and Eggs (US-RSPE), and U.S. Roundtable for Sustainable Beef (USRSB). Indicators are high-level descriptors of issues material to an organization's vision, mission and values. Indicators linked to people and planet were considered for that analysis, but here, the focus is on planet – or environment. Environmental indicators evaluated included energy use, greenhouse gas (GHG) emissions, land use, supply chain emissions, waste, water quality and water use. Tables 1 and 2 identify the frameworks analyzed and represent the relevance of each indicator within them.

Customer Examples of Relevant Sustainability Efforts on Feed

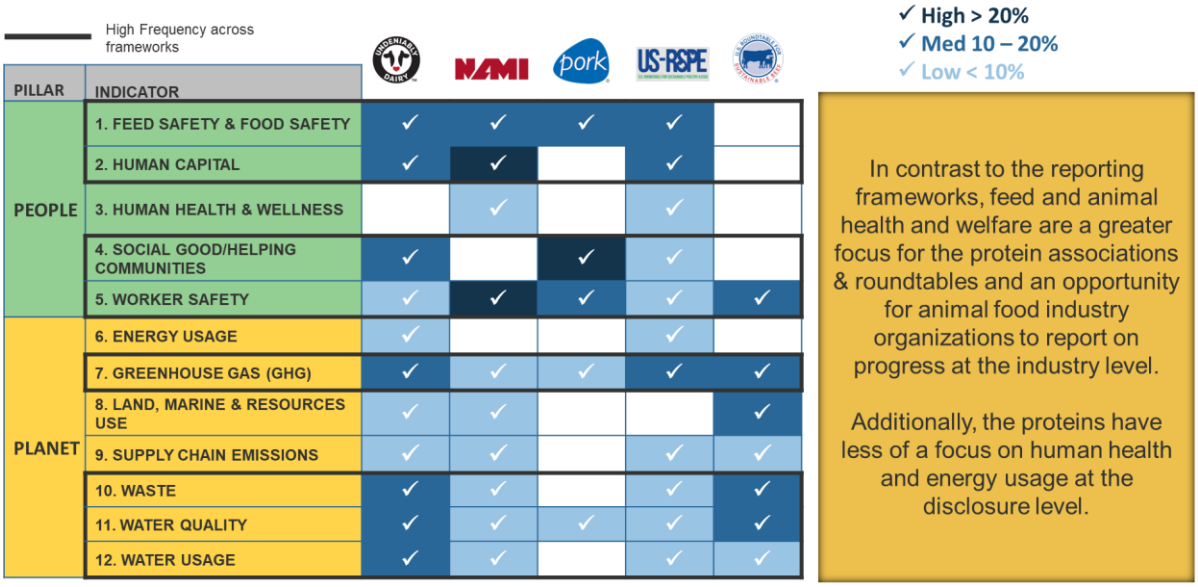
Through IFEEDER's engagement with stakeholders, specific examples regarding the environmental indicators have emerged, offering insights into the animal food industry's customers' needs.

- MPS Egg Farms – To place a low-carbon claim on packaging, MPS Egg Farms developed a pilot project to source, feed and track use of low-carbon grain grown with regenerative ag.
- McDonald's Corp. – In describing support needed from the feed industry, McDonald's indicated a desire for: feed sourced from land that was not newly converted from natural habitat; feed sources from crops produced using climate-smart practices; enteric emission-mitigating additives for dairy and beef, including those on pasture; and the ability to track practice outcomes throughout the supply chain.

Table 1. Name and description of the animal organizaton used to evaluate the six environmental indicators.

Framework	Description
1. Dairy (DMI, Dairy Net Zero, Innovation Center for U.S. Dairy, Undeniably Dairy)	Global **measurement of farm animal welfare** management, policy commitment, performance and disclosure in food companies.
2. North American Meat Institute (NAMI)	Global disclosure system for investors, companies, cities, states and regions to manage their environmental impacts *CDP Climate, Forests, and Water are included in this analysis
3. National Pork Board (NPB)	Comprises global **sustainability leaders** as identified by S&P Global through the Corporate Sustainability Assessment (CSA).
4. U.S. Roundtable for Sustainable Poultry and Eggs (USRSPE)	Global network of investors who are aware of the issues linked to **intensive animal production** and seek to **minimize the risks** within the broader food system.
5. U.S. Roundtable for Sustainable Beef (USRSB)	Companies report on environment, social, and governance impacts.

Table 2. Relevance of the indicators within each animal organization sustainability framework. High, medium and low represent the frequency of the indicators used within the overall framework.



PILLAR	INDICATOR		NAMI	pork	US-RSPE	
PEOPLE	1. FEED SAFETY & FOOD SAFETY	✓	✓	✓	✓	
	2. HUMAN CAPITAL	✓	✓		✓	
	3. HUMAN HEALTH & WELLNESS		✓		✓	
	4. SOCIAL GOOD/HELPING COMMUNITIES	✓		✓	✓	
	5. WORKER SAFETY	✓	✓	✓	✓	✓
PLANET	6. ENERGY USAGE	✓			✓	
	7. GREENHOUSE GAS (GHG)	✓	✓	✓	✓	✓
	8. LAND, MARINE & RESOURCES USE	✓	✓			✓
	9. SUPPLY CHAIN EMISSIONS	✓	✓		✓	✓
	10. WASTE	✓	✓		✓	✓
	11. WATER QUALITY	✓	✓	✓	✓	✓
	12. WATER USAGE	✓	✓		✓	✓

- USRSB – To support cow-calf operations, feed yards, processors and consumer-facing organizations in the beef supply chain, USRSB developed sustainability goals and indicators by sector. Within the feed yard, relevant to the environmental footprint of feed, important elements include reducing GHG emissions by 10% per year per pound of beef by 2030, supporting feedstuff growers to achieve participants' water sustainability goals, and enhancing cattle performance and feed yard efficiency.
- Iowa Select Farms – To capitalize on the interest in life cycle assessments (LCAs) by its stakeholders and customers, Iowa Select Farms has identified feed as the biggest part of their production system's environmental footprint and shared that it could be reduced by 40% with better data.

Opportunity to Reduce the Environmental Footprint

Ration Innovation

In general, reducing the environmental footprint of livestock and poultry production through feed falls into one of two categories: feedstuff production on the farm or ration innovation. For feedstuff production, farmers are adopting more sustainable practices on their cropping systems, for example, conservation tillage, fertilizer best management practices or

precision irrigation, which provide measurable results. For ration innovation, feed manufacturers are helping animal producers optimize feed intake and production efficiency through ingredients or additives fed directly to animals or by modifying on-farm feeding strategies to reduce waste.

Animal agriculture's downstream stakeholders tend to focus their engagement on reducing the footprint of feed on feedstuff production on the farm. The opportunity to be gained through carbon sequestration and improved soil health is significant. However, with today's focus on climate and GHG emissions and a likely greater focus on water and land use in the future, the animal food industry needs to better communicate the beneficial environmental implications of ration innovations that are being advanced by animal food industry members.

Corporate and academic research regarding the benefit, efficacy, cost and on-farm value of those innovations is a significant component of their development. But, considerations for an innovation's impact on sustainability may not be. Quantifying the impact of animal food innovation impacts on the environmental footprint of animals would help the industry communicate to stakeholders and place greater value on the industry's role as a sustainability opportunity for them.

Building on initial efforts to support animal food industry sustainability efforts, IFEEDER is undertaking a project with The Context Network to map nutrition performance benefits to indirect measures of environmental footprint reduction for six feed product categories, and the project will develop a guidance document industry members can utilize to grow this needed dataset.

Life Cycle Assessments

An LCA is a systematic analysis of the environmental impacts associated with all stages of a product's life. They are generally used to help analyze life cycle stages relative to overall environmental load, usually with an aim to prioritize improvements on products or processes or to compare between products for internal decisions. A mainstay in European sustainability efforts, are now a growing trend in the United States to support both customer' and consumers' demands for accountability and transparency in the supply chain. LCAs may become the cost of doing business, but they can also be a key driver of innovation. Within sustainability efforts, LCAs are also important in helping to create the narrative and telling the story around ingredients, products and production systems.

There is growing interest in using LCA data to help animal nutritionists and product formulators make decisions beyond least-cost ration development. Data sets like the one being developed by the Global Feed LCA Institute (GFLI) create opportunities to integrate life cycle sustainability aspects with least-cost formulation based on nutritional requirements. Creating the opportunity to provide life cycle aspects at the nutritionists' and formulators' fingertips is critical to operationalizing targets that have been set to reduce feed environmental impact.

IFEEDER has multiple efforts underway to support the industry's LCA needs. First, IFEEDER is working with The Context Network to develop industry guidance, based on GFLI parameters, to support LCA development for a growing number of products and ingredients. There is a need to harmonize LCA development to maximize information that can be published in the GFLI dataset. Second, IFEEDER is working with a collaborative, led by Iowa State University for the National Pork Board, to better account for manure nutrients in feedstuff production with LCA datasets. Manure versus commercial fertilizer as a nutrient source has the potential to significantly reduce the footprint of commodity crop-based feedstuffs, and it needs to be accounted for within GFLI.

Traceability

Traceability refers to the ability to track products and materials through their entire life cycles, from raw materials to finished goods and, ultimately, to the end consumers. For livestock and poultry production systems, that includes tracking the feed an animal consumes and its impact on the end product's footprint. Efforts like the Science Based Targets Initiative and carbon credit generation and sales are highlighting the need for traceability in the supply chain.

Capitalizing on both ration innovation and utilization of LCA data to integrate sustainability aspects with least-cost formulation based on nutritional requirements will require traceability. And it is something the animal production and feed industries need to start thinking about now.