

# Sustainable Solutions

A project funded by the beef checkoff is focused on addressing both scientific and consumer concerns regarding sustainable beef production.

by Kindra Gordon

You've likely heard the statistic: By the year 2050 — just 37 years from now — the world population will grow by 2 billion people, for a total of 9 billion people on the planet. As a result, food demand is expected to increase by 70%. However, in the future it is anticipated the agricultural industry will have limited land and water resources to produce agriculture commodities.

To address this population boom with limited agricultural resources, global experts agree that more sustainable and efficient food production methods will be key.

As well, a heightened awareness — and demand — by today's consumers for environmentally conscious products and production methods is further driving all agricultural commodities, including the U.S. beef industry, to strive for sustainable solutions.

Kim Stackhouse-Lawson, director of sustainability research with the National Cattlemen's Beef Association (NCBA), explains, "Sustainability has become a word at the kitchen table and is rapidly becoming an expectation for today's agricultural products. Increasing demand by consumers for greater transparency with respect to how their food is produced is resulting in sustainability becoming a major demand driver."

But, therein lies a challenge — the consumer's definition of sustainable often differs from industry and academic definitions, points out Stackhouse.

To resolve this definition difference, the beef checkoff is currently funding a sustainability project focused on addressing both scientific and consumer concerns regarding sustainable food production along all phases of the beef value chain.

## First project of its kind

Stackhouse reports that this project is the first and largest sustainability project of its kind and is setting the global standard for agriculture commodity sustainability research. Titled the "U.S. Beef Sustainability

Project," it will provide key information to continue to improve U.S. beef sustainability. Currently, this is the only scientifically based, holistic sustainability study that focuses on the beef supply chain from birth through consumption of the product by consumers.

Admittedly, the beef supply chain is one of the most complex biological, economic and social systems in the world. Stackhouse notes that to improve the beef industry's sustainability, we must understand how the three pillars of sustainability —

environmental responsibility, economic opportunity and social diligence — interact and influence the industry on a national and regional scale.

Specifically, findings from the project will be instrumental in the development of critical best management practices that demonstrate the industry's ability to produce the highest-quality beef in a responsible manner.

The project consists of three phases:

- 1) a hot-spot analysis, where data from a literature review and a stakeholder survey is evaluated;
- 2) a comprehensive life-cycle assessment (LCA) [compliant with the International Organization for Standardization (ISO)] of the beef production system from cradle to grave, which Stackhouse describes as birth of the animal all the way through to the disposal of the packaging that the consumer purchases the beef in; and
- 3) development of a tool for beef producers along the supply chain to enhance the sustainability of their operations.

## Hot-spot analysis

To date, the hot-spot analysis, which served as a qualitative assessment tool, has been completed, reports Stackhouse. This analysis included a search of publicly available literature and a stakeholder survey.

Fifty publicly available data sources were searched to identify perceived sustainability issues along the beef value chain and determine preliminary hot spots. The results

from the desk research helped to create the stakeholder survey, which served as the second portion of the hot-spot analysis. This survey was sent to nearly 100 stakeholders across the beef supply chain and consisted of an online survey; phone interview; and, in some cases, an in-person interview.

Responses were received from nearly 40% of identified stakeholders, including producers, retailers, restaurants, consumer groups, nongovernmental organizations (NGOs), suppliers, capital markets and academics.

The hot spots defined as potential areas for improvement within each sustainability area included environmental, social and economic by the participating stakeholders. Within the environmental area, the stakeholders identified the following perceived hot spots: water protection and use, land management and biodiversity, manure management, and greenhouse gas emissions and climate change. Hot spots within social sustainability included: animal welfare, animal nutrition and health, and food safety; while the economic hot spots included: traceability, product quality and profitability.

In addition to sustainability concerns, the hot-spot analysis identified sustainability areas that are positive (or are nonissues) within the beef community. These include: genetically modified crops, transportation, responsible advertising, working conditions, human rights and market integration.

Of the information, Stackhouse says, "This hot-spot analysis provides an overview of the current known story of sustainability in the beef industry and serves as a starting point for detailed elaboration of actions for improvement."

Upon completion of the U.S. beef life-cycle assessment and the hot-spot analysis, she adds, the results will be joined with scientific findings to create effective and practical best management practices that address the concerns of all stakeholders along the beef value chain.

## Work continues

Stackhouse reports that 75% of the LCA has been completed. She explains that the LCA portion of the U.S. Beef Sustainability Project is by far the most intensive and complex. It is being simulated over time to



demonstrate how the U.S. beef industry's sustainability has changed as production efficiencies have improved.

The producer advisory group that oversees this project has identified three time periods that are being evaluated that represent changes in the industry:

- 1) the 1970s (highlighting the shift to boxed beef);
- 2) the early 2000s (increased ethanol production and increased use of distillers' grains in cattle diets); and
- 3) 2011 (current day).

To ensure that the project and data collected is transparent and utilizes the best science available, the U.S. Meat Animal Research Center (USMARC), Clay Center, Neb., and Pasture Systems and Watershed Management Research Unit (PSWMRU), University Park, Pa., have collaborated to conduct model simulations on the live-animal portion of the beef supply chain (birth to farm gate). The USDA Agricultural Research Service (ARS) team is utilizing the Integrated Farm System Model, which is a comprehensive model for simulating the major processes and interactions of integrated crop and livestock production systems to simulate the beef-production system at the USMARC.

The remainder of the beef supply chain

**Table 1: Hot spots by area**

**Environmental responsibility:**

- ▶ water protection and use
- ▶ land management and biodiversity
- ▶ manure management
- ▶ greenhouse gas emissions and climate change.

**Social diligence:**

- ▶ animal welfare
- ▶ animal nutrition and health
- ▶ food safety

**Economic opportunity:**

- ▶ traceability
- ▶ product quality
- ▶ profitability

**Source:** U.S. Beef Sustainability Project hot-spot analysis.


(harvest through consumption) will be modeled using the eco-efficiency model developed by BASF. Collaboration with three packing companies is being done to ensure that the eco-efficiency model predicts inputs and outputs of harvest through distribution of the beef value chain accurately.

Additionally, collaboration with two retailers is taking place to allow for data collection at the retail level.

Once the U.S. beef life-cycle assessment is finalized, that data will be combined with the

hot-spot analysis information to develop effective and practical best management practices that address the sustainability concerns of all stakeholders along the beef value chain.

Stackhouse says, "The results of this initial project will help guide our research efforts to continue to improve beef sustainability on a U.S. and regional scale. As this revolutionary checkoff-funded research progresses, the industry will learn more about practical environmental mitigation techniques and the importance of social responsibility and economic viability as sustainability measures. Furthermore, this research will allow the beef industry to focus on areas within the supply chain where sustainability improvements are practical and can actually make a difference."

She concludes, "Sustainability should be viewed as a journey rather than a destination; if the beef industry continues on this proactive and innovative scientific path, the industry will achieve the goal of a more sustainable beef product for many years to come." 

**Editor's Note:** To complete the current U.S. Beef Sustainability Project, the beef checkoff has partnered with BASF, a leading global supplier of ingredients for human and animal nutrition. Additional partners include the USMARC and PSWMRU. The beef checkoff contracted with the NCBA to develop and manage the project.