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SUSTAINABILITY

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Photo: iStock/ johny007pan

SUSTAINABILITY

The word sustainability is defined as: maintaining a specific rate or level. As it pertains to the environment, sustainability is avoiding the depletion of natural resources to maintain an ecological balance.

Sustainability within livestock production includes:
Economics · Environment · Health · Welfare

The United States Department of Agriculture defines sustainable agriculture as an integrated system of plant and animal production practices having a site-specific application that will over the long-term:

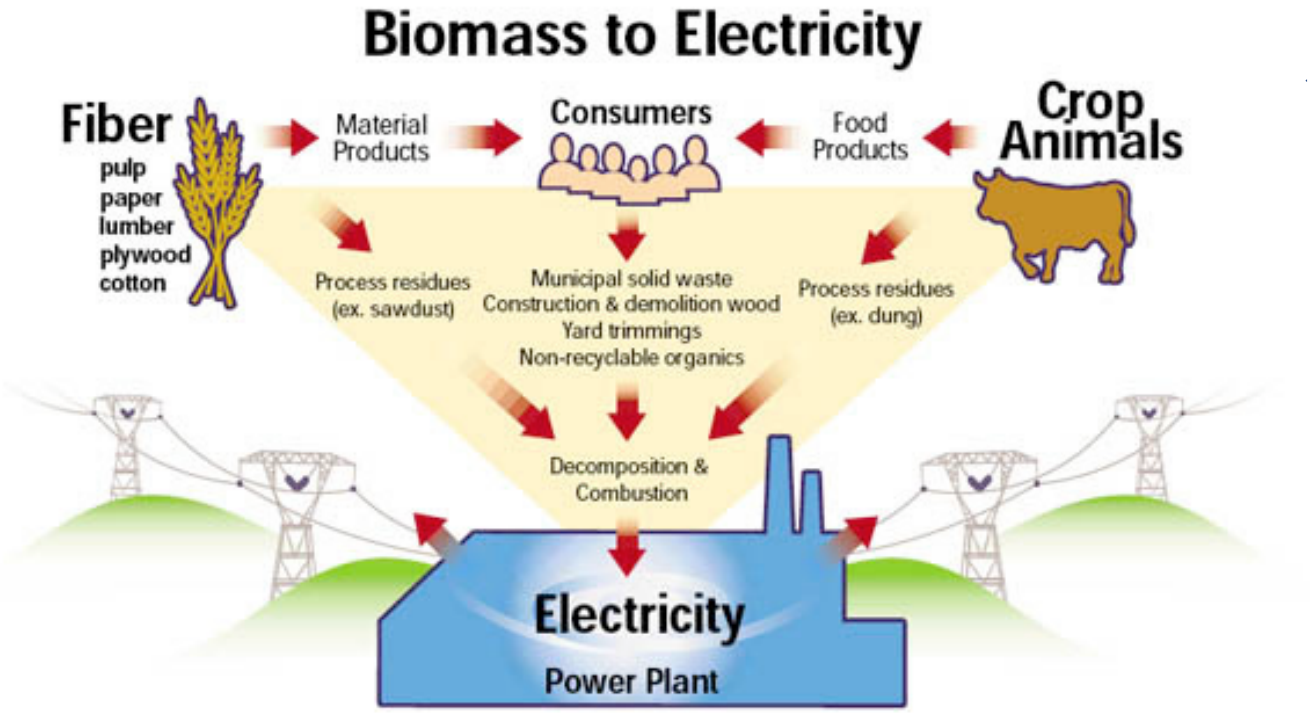
- **Increase profitable farm income**
- **Promote environmental stewardship**
- **Enhance quality of life for farm families and communities**
- **Increase production for human food and fiber needs**

Farmers are very aware of the impact of their farming practices on the environment. For this reason, they try to limit their use of non-renewable resources.

Source (https://nifa.usda.gov/program/sustainable-agriculture-program)

Environment

Farmers do their best to avoid using non-renewable resources where possible but also try to find new ways to keep their farms running using resources that are already available. This has led to some interesting inventions, for instance, manure digesters, which allow farmers to reuse animal waste for fuel, fertilizer, and electricity.



Source (https://rashmigroupkolkata.wordpress.com/2015/05/02/rashmi-groups-contribution-to-energy-conservation-using-waste-gas/)

When sustainable farms use waste to create new things for their farm, they are using a "closed system." This means the farmer is reusing all they can, and they also keep the environment healthy by breaking down toxins and harmful waste for positive uses such as creating **electricity.**

Photo: iStock/ Igor Levin

Economy

Farmers must be economically sustainable! One example of economic sustainability is product diversification. For instance, a grain farmer may decide to add livestock to their operation. One of the most persistent problems in agriculture is the unpredictability of the weather. Everything from drought to heavy thunderstorms can kill crops and make it difficult for the farmer to finish their work. Other factors, like disease and falling prices for crops, contribute to making farming a very risky business.

What farmers can do

To reduce risk and increase economic sustainability, farmers diversify their farms. This means growing multiple crop types and or raising multiple animal species. Therefore, if disease or disaster strikes one type of plant or one type of animal, the farmer has other sources of profit.

Photo: iStock/ SKatzenberger

Health

Everyone gets sick from time to time, including farm animals. How do farmers keep their animals healthy? The most important things a farmer can provide their animals are clean water, feed and a healthy environment. There are many different ways that farmers help prevent sickness and injury on their farms. One way is to vaccinate their animals against diseases. This is very similar to when you are vaccinated! Farmers work with their veterinarians to develop safe and effective vaccination programs.

Photo: iStock/ Chalabala

Welfare

Do you own a pet or have you ever taken care of an animal? If so, then you know how important it is to take care of them and provide clean water, feed and a place to sleep. Whether the animal is a pet or used in research or agriculture, they require the same things. Excellent animal welfare practices help to ensure that we take care of our animals.

Animal welfare refers to an animal that is healthy, comfortable, well nourished, safe, able to express natural behaviors and is not suffering from pain, fear or stress. Good animal welfare requires disease prevention, veterinary treatment, appropriate shelter, management and nutrition and humane slaughter. Animal scientists ensure animal welfare through many different ways including regulations, quality assurance programs and audits, and enrichment.

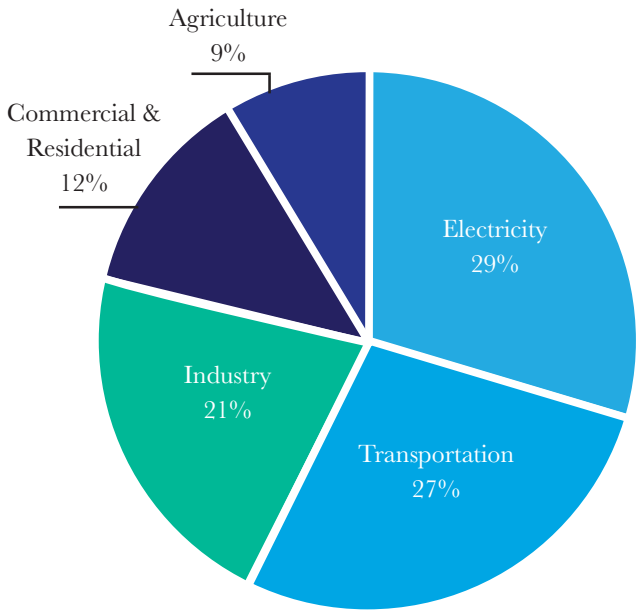
Photo: iStock/ Debove Sophie

Greenhouse Gases

Every living animal produces greenhouse gases (GHG). Greenhouse gases are found in the earth's atmosphere and are produced in nature and through the industry. If GHG increase, the temperature of the earth increases. The most abundant GHG are carbon dioxide, methane, nitrous oxide, and fluorinated gases.

The agriculture industry produces GHG, in varying amounts around the world. Global livestock production works hard to continually improve environmental sustainability and continue to reduce the level of greenhouse gases. Currently, in the U.S., animal agriculture accounts for three percent of the total greenhouse gasses emitted.

Total U.S. Greenhouse Gas Emissions by Economic Sector in 2015



One of the largest sources of methane is livestock and manure emissions. Most of this methane is a result of manure storage and enteric fermentation (a digestive process where carbohydrates are broken down by microorganisms). This is why farmers have developed the manure digester, to decrease methane emissions.

The Dairy Industry and Sustainable Agriculture

- The dairy industry has increased milk production by 25% over the last 10 years with no increase in GHG!
- Over the last 50 years, the pork industry has reduced their GHG emissions by 35% for every pound of pork produced!
- The beef industry reduced GHG emissions by 15 percent between 1981-2011. The United States produces 18% of the world's beef with only 8% of the world's cattle!

That is being EFFICIENT! Check out the infographic on the next page for more information on how the dairy industry has decreased their environmental impact.

Source: Graph (https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions)

The effects of improved performance in the U.S. dairy cattle industry on environmental impacts between 2007 and 2017.

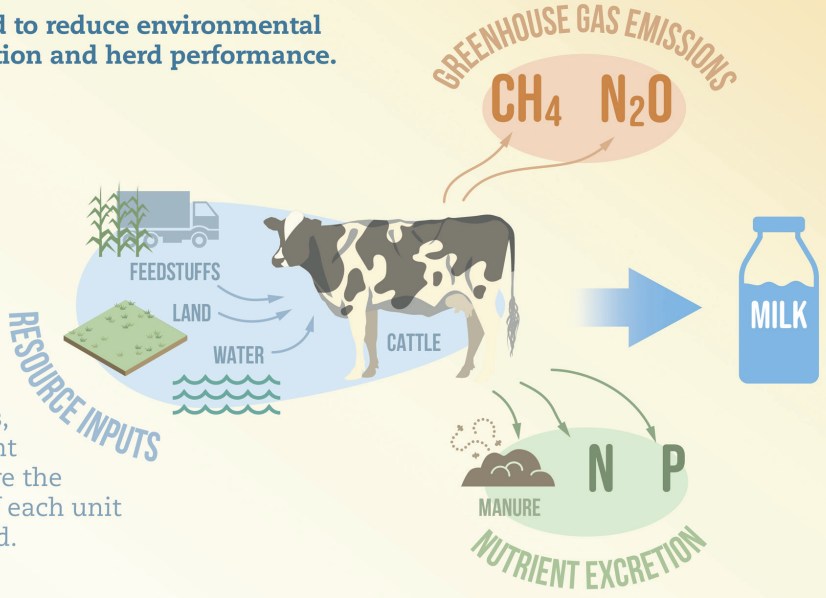
ASAS EDITORIAL

AMERICAN SOCIETY OF ANIMAL SCIENCE

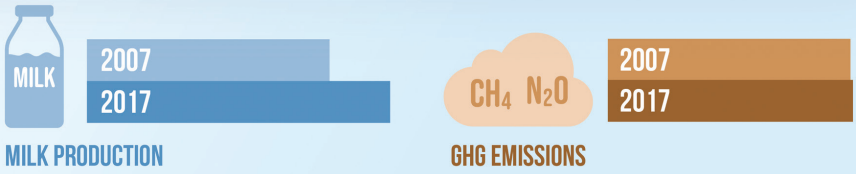
The U.S. dairy industry has worked to reduce environmental impacts by improving crop production and herd performance.

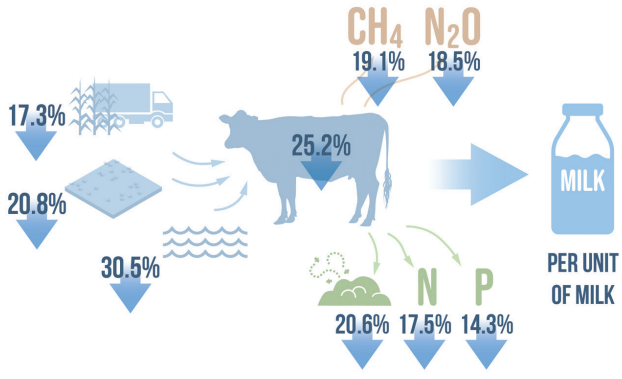
Milk yield per cow has increased over the past decade, but **has milk production become more sustainable?** We compared the whole-system environmental impact of U.S. dairy production from 2007 to 2017.

We used a model of cow population demographics, metabolism, and nutrient requirements to compare the environmental impact of each unit of milk produced.



In 2017, **~25% more milk was produced for a similar amount of GHG emissions** as in 2007.





INFOGRAPHIC BY FUSE CONSULTING LTD.

From 2007-2017, resource use, nutrient excretion, and GHG emissions per unit of milk were all reduced.

The U.S. dairy industry has made environmental progress over time. Looking forward, the dairy industry should build on these gains and demonstrate a continued commitment to reducing environmental impacts.

Source: Infographic: Improved performance in the US Dairy Cattle Industry on Environmental Impacts, Journal of Animal Science, Volume 98, Issue 1, January 2020, skaa017, https://doi.org/10.1093/jas/skaa017

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