SUSTAINABILITY IMPACT REPORT

ANIMAL AGRICULTURE IN THE UNITED STATES

Animal Agriculture Alliance
Connect | Engage | Protect

Updated September 2025

Sustainability

Environmental Stewardship

Social Responsibility

Economic Viability

SUS-TAIN-A-BIL-I-TY

/səˌstānəˈbilədē/

noun

meeting the needs of the present without compromising the ability of future generations to meet their needs.

The meaning of sustainability has been subjected to a variety of interpretations, but it is critical to understand that sustainability is a continuous journey, rather than a destination. For farmers and ranchers, sustainability is more than a buzzword. It is a promise to future generations that they will care for the land, air, water, and livestock by producing safe and nutritious meat, dairy, poultry, eggs, and seafood while balancing economic viability, social responsibility, and environmental stewardship.

The topic of responsible and sustainable animal agriculture has received a lot of attention in recent years, but these concepts are nothing new to the American farmer. Given the rise of social media and increased interest in food production by consumers, the people asking questions about sustainability are not just neighbors, friends, and relatives but include audiences around the world. This puts animal agriculture under increased scrutiny and means farmers have to put far more emphasis on the social side of sustainability than ever before - but it also provides an opportunity for farmers to showcase how they are part of the sustainability solution!

This report highlights how the animal agriculture community shares the same values as today's consumer with its never-ending commitment to animal care, environmental stewardship, responsible antibiotic use, food safety, and nutrition.

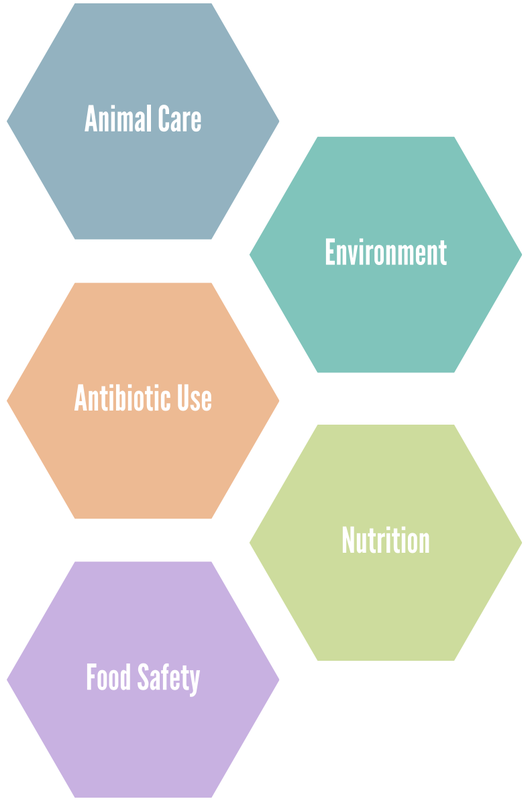


Table of contents.

Overview

Dairy

Veal

Beef

Pork

Chicken

Eggs

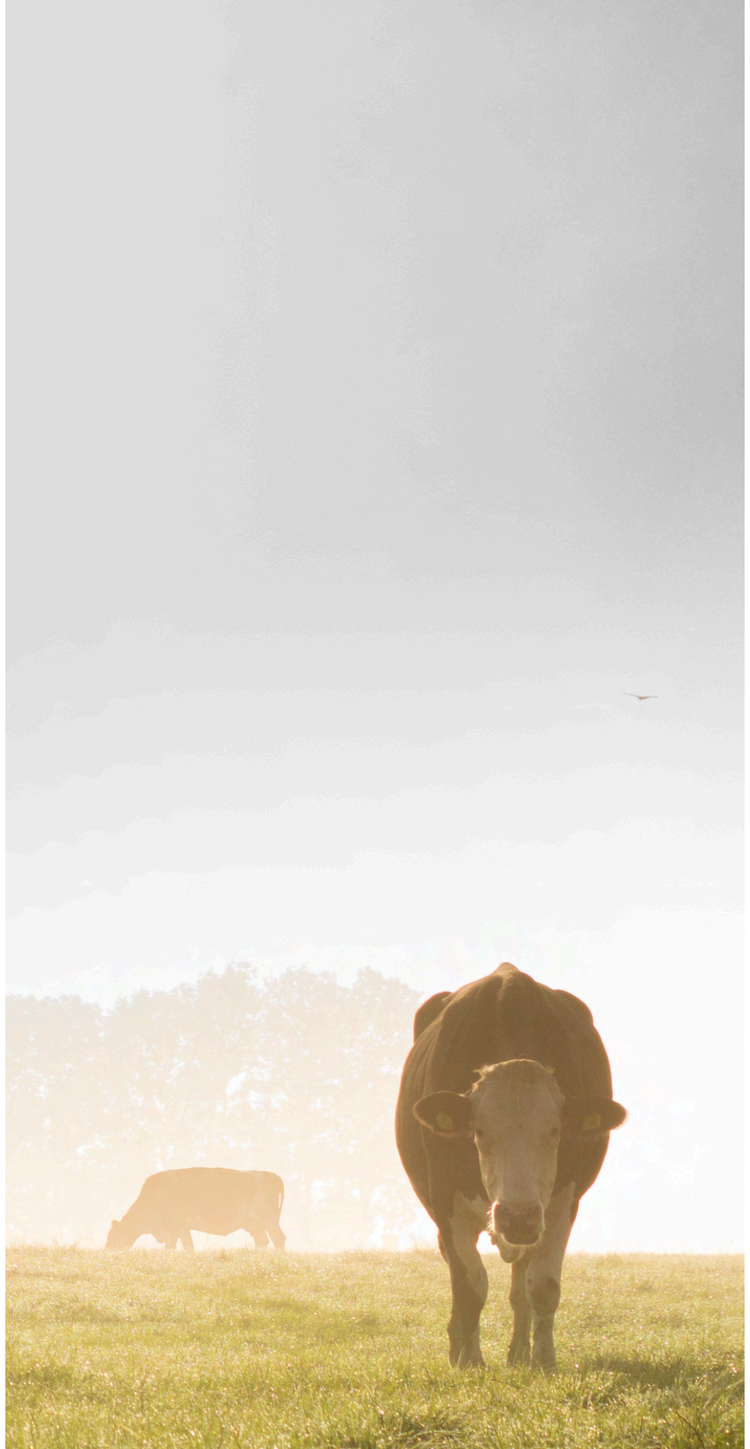
Turkey

Lamb

Seafood

Animal Feed

What's next?



Rooted in responsibility.

Raising food is a way of life that requires dedication and hard work. Farmers and ranchers recognize this as both a duty and a privilege. No one can deny that raising food looks a lot different than it did 50, 25, or even five years ago. To feed a growing population safely and efficiently, and to prioritize the highest standards of animal care, the entire animal agriculture community has worked tirelessly to identify areas for improvement. Whether it is making sure that animals are getting the best care possible, using antibiotics judiciously, or making major strides in food safety and sustainability, the entire animal agriculture community has improved to continuously meet consumer expectations over the years and will continue to do so in the future.

Today's farm animals are raised by a broad network of dedicated people who care deeply about animal well-being. Farmers and ranchers have an ethical obligation to care for animals raised for food, and they take that responsibility seriously. Animal well-being is critical to providing the best quality food products and is the highest priority for both large and small farms.

American farmers have sought to farm not only in an ethical manner but also in an environmentally sound and sustainable manner. The animal agriculture community is continuously advancing to use natural resources efficiently while producing safe, abundant food to nourish a growing population—the vast majority of whom enjoy a diet comprised, in part, of meat, poultry, dairy, eggs, and seafood.

Each sector of the animal agriculture community has made tremendous improvements in all areas of farming, including environmental sustainability, and is committed to continued progress. Collectively, U.S. animal agriculture is actively contributing toward all 17 of the Sustainable Development Goals introduced by the United Nations.

In addition, organizations from various sectors of agriculture have joined forces in the Protein PACT, the largest-ever effort to strengthen animal protein's contributions to healthy people, healthy animals, healthy communities, and a healthy environment. Similarly, the U.S. Roundtable for Sustainable Poultry & Eggs and the U.S. Roundtable for Sustainable Beef are developing multi-stakeholder sustainability reporting frameworks to continually monitor progress.

When it comes to conservation and sustainability, America's farmers and ranchers are literally the boots on the ground. See what they're doing.

U.S. animal agriculture is actively contributing toward each of the United Nations' Sustainable Development Goals! See how in our report, U.S. Animal Agriculture and the U.N. Sustainable Development Goals.

U.S. animal agriculture is a model for the rest of the world. Just imagine how far we will go in the future!

What does animal agriculture bring to the table?

Farming and ranching provides the food, fuel, and fiber that millions of families around the world depend on. While farm and ranch families comprise less than 2% of the U.S. population, they work each day to provide these products to 100% of the general public. Through innovation, determination, and support, they are responsible for the safest food supply in the world. As cliche as it may sound, feeding the world is no easy task, but America's farmers, ranchers, veterinarians, animal health companies, animal scientists, food processing facilities, and everyone with a role in getting food from the farm to the table is up to the challenge.

Meat, eggs, and milk are an essential source of nutrients, especially for vulnerable populations.[18]

Meat, dairy, poultry, eggs, and seafood provide different essential nutrients that each have their own role in a healthy, sustainable diet. These nutrients help support a healthy heart, brain, eyes, immune system, lungs, bones, muscles, and much more.

HEART HEALTH

IMMUNE SYSTEM

BRAIN FUNCTION

OXYGEN USE

MUSCLE BUILDING

BONE HEALTH

One U.S. farm is able to feed 169 people![14]

Animal agriculture does contribute to greenhouse gas (GHG) emissions - but not as much as you might think.

According to the Environmental Protection Agency's 2022 Inventory of U.S. Greenhouse Gas Emissions and Sinks, agriculture accounts for 9.4% of U.S. GHG emissions while livestock production is only 4.3%.[48]

Today's family farms look different.

About 1.9 million farms are scattered throughout the United States with 95% of them operated by families. They aren't always standing outside a romanticized red barn, but that doesn't make them any less of a family farm. Today, 30% of all farmers are beginning farmers and 36% are women![1]

Animal byproducts are used to make several things we use every day![44]

TIRES

MEDICINE

FOOTBALLS

AND MORE!

Animal agriculture is a diverse community of professionals and organizations dedicated to producing safe, wholesome, and nutritious food.

- Animal Scientists
- Restaurants and Retailers
- Consumers
- Farmers and Ranchers
- Food Companies
- Veterinarians
- USDA and FDA
- Animal Ag Associations
- Animal Nutritionists
- Food Scientists
- Animal Health Companies
- Feed Mills

DAIRY

Dairy Cattle Animal Care

Created in 2009, the National Dairy Farmers Assuring Responsible Management (FARM) Animal Care Program provides consistency and uniformity to best practices in on-farm animal care and quality assurance through a nationwide, verifiable program. Program participation is open to all dairy farmers, cooperatives, and processors. Participants follow rigorous guidelines to ensure the utmost social responsibility on our nation's dairy farms, while recognizing there is always room for improvement. FARM creates a culture that inspires our dairy community to work every day toward positive change. Strong farm management practices paired with smart decisions are ethical obligations of any dairy business and are vital to ensure long-term success. Over 99% of the U.S. milk supply comes from farms participating in the FARM Animal Care Program, demonstrating the commitment of U.S. dairy farmers and the broader dairy community to assuring the health and welfare of dairy cows through exceptional cow care.

Demonstrating a commitment to excellent care.

Dairy farmers use best management practices as outlined in the FARM Animal Care Program to ensure their cows are well-cared for.

Barns made for cow comfort.

Modern dairy farms today include housing that allows cows to stand up, lie down, and rest comfortably and without risk of injury. Housing also provides protection from the heat and cold!

Some cows wear pedometers.

Pedometers can help the farmer track important information for each cow, such as how often a cow is chewing her cud -- which can help them figure out if a cow is not feeling well. They can also help track how much milk each cow provides.

Milking time!

Every day, usually two or three times a day, dairy cows are milked. With cow comfort top of mind, milking machines are placed onto the cows' udders. With modern technology, each cow is milked and on its way in about five to seven minutes on most farms.

Farmers work closely with veterinarians to ensure cows receive proper care.

Day in and day out, dairy farmers provide the best in animal care. There are occasions when animals may get sick and need antimicrobial therapy to overcome a specific disease challenge. Dairy farmers strategically and prudently use antimicrobial therapy to help an animal that has been threatened with a disease. Farmers take this responsibility of prudent antimicrobial use seriously and take many precautions with their antibiotic-treated animals so that their milk or meat does not enter the food supply until the treatment has safely passed through their system. Verified through the FARM Animal Care Program, farmers work closely with their veterinarian to develop herd health plans to prevent potential diseases or illness.

Since 2011, zero retail-ready milk products have tested positive for traces of antibiotics. All milk is screened for antibiotics and any load that tests positive for a drug residue is discarded and never sold.[52]

Calf care is top-notch.

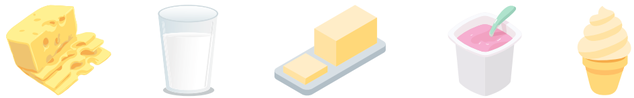
Farmers make it a top priority to get their animals off to a healthy start. For dairy calves, farmers ensure the calves receive colostrum, or the first milk which is full of antibodies to keep them healthy, and dry individual pens to ensure the dairy calves receive the best care and are protected from harmful germs until their immune systems mature. The Calf Care & Quality Assurance program provides farmers and farmworkers with best practices in line with animal welfare expert recommendations.

Dairy Environmental Stewardship

The dairy community is a key part of the solution to the sustainable nutrition challenge—that is, the dual need to ensure food security and nutrition for a fast-growing global population while reducing the environmental impacts of agriculture. Dairy foods are nutrient-rich and accessible, and farmers are committed to responsible and sustainable production.

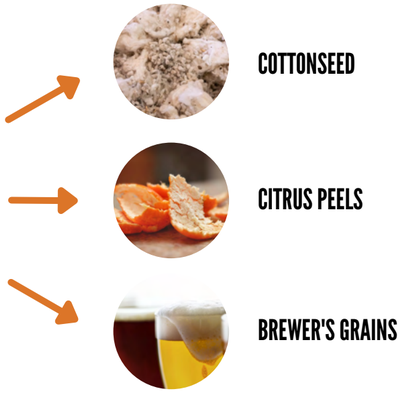
Through improved nutrition, animal care, and genetics, dairy farmers are using fewer natural resources and reducing their environmental impact!

Thanks to improved farming practices, U.S. dairy farmers are producing more milk to nourish people with a lower environmental impact. Between 2007 and 2020, U.S. dairy farmers have produced 28% more milk while reducing GHG emissions per gallon of milk by 13%! [55]



Cattle are great recyclers. Coproducts and byproducts from human foods that would otherwise go to waste become nutritious feed for cattle.

Dairy farmers are always evolving their feed management techniques to ensure cow health, realize production efficiencies, and improve the environmental sustainability of their farms. While each farm is unique, most dairy cows eat nutritious feed that consists primarily of grass, along with some grain and natural byproducts such as almond hulls, canola meal, or citrus pulp that humans cannot eat and would otherwise become landfill waste. In fact, 37% of ingredients used in animal feeds are byproducts from other industries! [54] Research has found that feeding byproducts to cows decreases GHG emissions by more than 4.5 times compared to composting and 49 times compared to landfill disposal.[8]



In 2020, the U.S. dairy community committed to becoming greenhouse gas neutral by 2050! Read more.

The FARM Environmental Stewardship program is helping farmers track and communicate their farm's environmental achievements as well as set a path for continuous improvement. Learn more.

Dairy farms can use anaerobic digesters to convert cow manure into usable energy. Even waste may not go to waste on a dairy farm!

U.S. dairy is committed to continuous improvement through the ongoing, science-based pursuit of solutions that provide affordable, accessible, nutrient-rich foods that nourish the world's growing population while also protecting environmental resources. Dairy farms across the country are increasingly adopting conservation tillage, diverse crop rotations, and cover crops to improve soil health; precision feed management to achieve cow health and production efficiencies; and innovative manure management technologies to produce energy and reduce air- and water-quality impacts.[49]

How much GHG emissions come from dairy?

For generations, U.S. dairy farmers have used progressively fewer natural resources to produce milk. While it has been estimated that U.S. dairy accounts for less than 1% of total U.S. GHG emissions, the dairy community is committed to conserving natural resources and further reducing its environmental impact.[21]

What if we got rid of dairy cows?

Have you ever wondered what a world without cows would look like? A 2020 study from Virginia Tech found that the removal of dairy cattle from U.S. agriculture would only reduce greenhouse gas emissions by 0.7%. However, this would also create a large nutritional gap for consumers.[59]

Dairy Nutrition and Food Safety

Dairy foods like milk, cheese, and yogurt provide essential nutrients that help nourish people and contribute to health. Eating dairy foods help Americans meet recommendations for calcium, vitamin D, and potassium, three of the four under-consumed nutrients of public health concern identified in the 2020-2025 Dietary Guidelines for Americans.[2] Milk provides 13 essential nutrients and is also the number one food source of calcium, vitamin D, and potassium for all Americans ages 2 years and older.[25]

Each glass of milk provides 13 essential nutrients![53]

Niacin	Vitamin A	Protein
Vitamin B12	Phosphorus	Vitamin B5
Vitamin D	Riboflavin	Calcium
Iodine	Potassium	Selenium
		Zinc

Milk's essential nutrients can be difficult to replace in a healthy dietary pattern. Three 8-ounce cups provide as much calcium as approximately 17 cups of raw kale.[50]

The U.S. dairy community supplies enough:[59]

protein for **169** million people

calcium for **254** million people

energy for **71.2** million people

Dairy foods provide nourishment and quality nutrition at a tremendous value. Not only are dairy foods accessible and available in convenient and affordable options, they also come in many varieties, including lactose-free. Dairy foods can meet multiple taste, cultural, and health needs to support health and prosperity, which every person has the right to and deserves. At a time when affordable and sustainable nutrition to benefit public and planetary health has never been more important to our world, dairy foods contribute to the solution to address nutrition security, nutrient gaps, health disparities, and well-being.

When eaten as part of an overall healthy diet, dairy foods like milk, cheese, and yogurt can be linked to reduced risk of cardiovascular disease and type 2 diabetes!

According to the 2020-2025 Dietary Guidelines for Americans, healthy dietary patterns, which include low-fat and fat-free dairy foods (milk, cheese, and yogurt), are linked to reduced risk of cardiovascular disease and type 2 diabetes. Dairy consumption is also linked to improved bone health, especially in children and adolescents. In addition, milk, cheese, and yogurt provide high-quality protein complete with all of the amino acids people need to help build and repair muscles.

A bit about dairy food safety...

U.S. milk and dairy foods are among the safest, most regulated foods in the nation. The U.S. Food and Drug Administration safeguards the nation's milk supply through the Grade "A" Pasteurized Milk Ordinance. In addition, the dairy community's voluntary best practices and collaborative approach provide additional assurances that all dairy foods meet the highest level of food safety. Most foodborne disease outbreaks associated with dairy products are due to the consumption of raw (unpasteurized) milk and products made from it. For instance, between 2013 and 2018, there were 75 outbreaks with 675 illnesses that were linked to unpasteurized milk.[9] This is why the dairy community is in lock-step with CDC guidance to avoid consumption of raw milk.[69]

VEAL

Veal Calf Animal Care

Veal calves are raised on family farms that are proud to share more about their ongoing dedication to doing what's right. The Veal Quality Assurance program is a set of science-based best practices and standards developed by farmers, veterinarians, and animal care experts to ensure that veal calves receive quality care through every stage of life and are raised using production standards that result in a safe, wholesome, quality product that meets or exceeds regulatory and customer expectations.

Barns are made for calf comfort.

Modern veal barns are heated during cold months and have year-round ventilation to allow for clean, fresh air. All calves are provided with a dry, clean place to rest and the necessary food, water, and care to protect the health and well-being of each animal.

Calves get regular checkups from veterinarians.

Veal farmers have an ethical obligation to provide each animal with appropriate quality care through each stage of life. Farmers work with a licensed veterinarian to diagnose, treat, and manage herd health.

Veal farmers take animal care seriously.

Good nutrition and comfortable facilities are essential to healthy calves that grow and thrive. If an animal becomes sick and needs an antibiotic, farmers work closely with a veterinarian to use antibiotics responsibly to treat and control the illness.

Milk-fed veal calves are raised for approximately six months and marketed at 500 pounds or more.

Dairy bull calves are purchased from dairy farmers or at auction markets when calves are just a few days old and weigh about 100 pounds.

Take a look at how veal calves are raised!

Veal farmers make sure calves get the nutrients they need.

The majority of veal calves are fed a milk formula twice a day as well as grain. The milk-fed calves are fed nutritionally-balanced milk diets. These specially-controlled diets contain iron and 40 other essential nutrients, including amino acids, carbohydrates, fats, minerals, and vitamins.[5] Learn more.

Housing has changed for veal calves over the years.

When dairy cows give birth to a bull calf, these calves can be raised for beef or veal. Veal farmers receive calves a few days after birth. They are raised in individual pens for the first 6-8 weeks because they have no immunity and could easily get sick. Then, calves are moved to group pens where they have plenty of space to lie down, turn around, and naturally groom themselves.[5]

Veal farmers support their fellow farmers in the dairy community by raising male Holstein calves and using whey from local cheese plants to help calves meet their nutritional needs.

Veal Environmental Stewardship

The U.S. veal community is committed to continuous improvement and conservation of natural resources.

In 2023 and 2024, the U.S. veal community completed its first-ever Lifecycle Assessment of milk-fed veal.[43]

This Lifecycle Assessment (LCA) was developed with the goal of estimating the efficiency of converting resources like energy, fuel, and feed into nutrient-dense veal. The study found farms had an environmental impact of 2.88 kg of greenhouse gas (GHG) emissions per kg of veal.

Soil on U.S. veal farms sequesters more carbon than emitted, reducing overall environmental impact by 17%![43]

Thanks to environmental stewardship and careful conservation practices, veal farmers are able to tap into the power of the soil to remove carbon emissions from the atmosphere.

Veal Nutrition and Food Safety

Veal is a lean choice for a healthy, balanced diet with about 170 calories per serving, a mere 8% of the recommended daily value. It is also a nutritional power source with most cuts being an excellent or good source of iron, zinc, niacin, vitamin B12, selenium, vitamin B6, phosphorus, choline, and riboflavin.[51]

A 3-ounce serving of veal loin chop is low calorie and has just 3.8 grams of total fat.

Veal is a lean protein powerhouse with cutlets, loin chops, shoulderblade chops, and foreshank osso bucos meeting the criteria for “extra lean” by USDA standards. Each of these cuts has less than five grams of total fat, two grams of saturated fat, and 95 milligrams of cholesterol.[51]

Recipe image from Kita at Girl Carnivore

Veal has more protein per serving than any other meat!

A 3-ounce serving of grilled veal has 27 grams of protein, helping to keep you feeling fuller, longer.[51]

Recipe image from Holly at Taste and See

A bit about veal food safety...

Once calves leave the farm, they are inspected by federal and state agencies throughout each step of the production process to ensure food safety. All state and federal meat inspection is overseen by the USDA Food Safety and Inspection Service (FSIS), which regulates food safety standards for raw meat. FSIS inspectors work within meat processing and packing plants to ensure compliance. Only raw meat that meets the FSIS standards for safety, wholesomeness, and labeling is given a USDA seal.

BEEF

Beef Cattle Animal Care

Proper animal care is the responsibility of everyone in the beef community. Cattlemen and women recognize ensuring animal well-being is the right thing to do. The Beef Quality Assurance Program (BQA) was created in 1987 and includes research, training, and certification that help farmers and ranchers provide the best care to their cattle. The handling and care of more than 90% of cattle in feedyards today are influenced by the farmer- and rancher-created and veterinarian-endorsed BQA program.

Raising beef cattle is a team effort and usually includes several lifecycle phases:

COW-CALF RANCH

Newborn calves weigh 60-100 pounds. For the first few months they live off their mother's milk and graze on pasture.

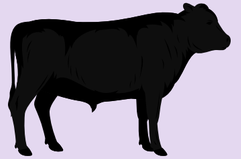
STOCKING AND BACKGROUNDERS

Cattle continue to grow by grazing on pasture. They receive supplemental feed including vitamins and minerals to meet their nutritional needs.

LIVESTOCK AUCTION MARKETS

Cattle may be sold at livestock markets to other beef ranchers, feedyards, or processing facilities.

FEEDYARDS



Cattle are often moved to feedyards where they eat a grain-based diet. Cattle receive individual care from pen riders, veterinarians, and nutritionists.

Cattlemen and women take their responsibility to protect animal and human health seriously.

Cattle farmers and ranchers consult with veterinarians to develop a health program for cattle designed to keep the herd healthy and protect the future use of antibiotics for human and animal health. The future effectiveness of these animal health tools is just as important to farmers and ranchers as it is to the general public.

Cattle spend most of their lives on pasture.

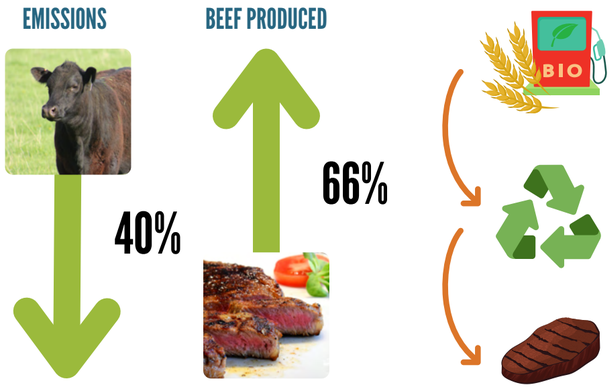
Cattle can be grass-finished or grain-finished, but nearly all cattle spend the majority of their lives on pasture eating grass. After spending the first 2/3 to 3/4 of their life grazing, grain-finished cattle will go to a feedyard for the last four to six months of their lives where they are under the supervision of cattle nutritionists and veterinarians. At the feedyard they will eat a grain-based diet with hay.

Beef Cattle Environmental Stewardship

The beef community is committed to continuous improvement in environmental stewardship and sustainability. Farmers and ranchers continue to implement new technologies and strategies to reduce their impact on the environment and ensure that their animals are being raised responsibly.

Raising and producing beef has only become more sustainable over time!

Between 1961 and 2019, the U.S. beef community, through continued sustainability efforts and improved resource use, has reduced emissions per pound of beef produced by more than 40% while also producing more than 66% more beef per animal.[57,66]



It's time to rethink methane! Did you know methane emissions from cattle are recycled in a natural process known as the biogenic carbon cycle?

How much GHG emissions come from beef?

Raising cattle does contribute to GHG emissions but not as much as you might think. U.S. beef production represents only 2.3% of U.S. GHG emissions, thanks to unparalleled efficiency and dedication to stewardship.[77]

Cattle benefit the environment by combating food waste and promoting ecosystem services.

Cattle help with food waste by acting as “upcyclers” in our food system, eating grass and unusable byproducts like the left-over distilled grains created during biofuel production and turning them into nutrients that we can digest. This recycling power of cattle makes the whole system complementary and more sustainable.

Beef cattle farmers and ranchers are not only managing their herd, they are also managing the land that they use! Beef cattle spend the majority, if not all, of their lives on grassland or rangeland and are able to provide ecosystem services, or benefits we receive from the ecosystem, to these lands. In addition, grazing cattle make use of pasture and rangelands that are not suitable for growing crops. Grazing also provides wildlife habitat and increases plant diversity! [65]

If the rest of the world's cattle production matched the U.S.' efficiency, carbon emissions would be much lower!

The U.S. has been a global leader in beef production with the lowest carbon emissions per kilogram of beef in the world for the past 25 years.[57,64] This allows the U.S. to produce nearly 18% of the world’s beef with less than 6% of the world’s cattle! [57]

In 2021, the U.S. beef community committed to becoming climate neutral by 2040! Read more.

Similarly, in 2022, the U.S. Roundtable for Sustainable Beef launched sustainability goals to achieve climate neutrality within the beef value chain by 2040. Learn more.

In the U.S. most cattle spend their last 4-6 months consuming a high-energy diet consisting of grains, byproducts, and grasses.

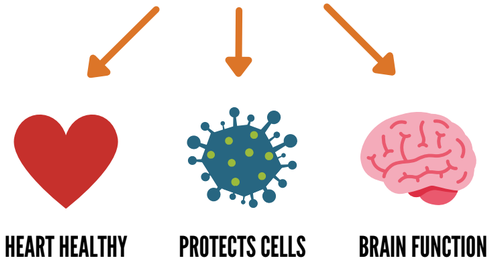
This type of management lowers the carbon footprint by 18.5% to 65.7%.[46,75,76]

Beef Nutrition and Food Safety

Beef has 10 essential nutrients: iron, zinc, phosphorus, choline, niacin, riboflavin, selenium, vitamin B6, vitamin B12, and protein. These nutrients help your body use oxygen, support your nervous system, promote energy production and a healthy metabolism, build strong bones and teeth, maintain a healthy immune system, and more!

Lean beef is good for your body and mind!

A 2014 study concluded that lean red meat's inclusion in the diet supports cardiovascular health.[30] The selenium in beef helps protect cells from damage while vitamins B6 and B12 help maintain brain function.



10/10/10 Rule:

One 3-ounce serving of lean beef:

provides more than: **10%** of

10 essential nutrients and vitamins

for less than **10%** of your daily calories!

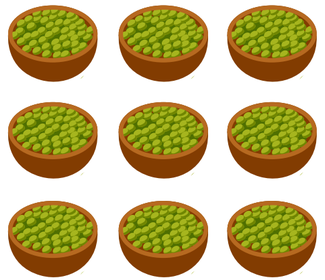
You would have to eat twice as many calories worth of beans, peas, and lentils to get the same amount of protein in a 170 calorie serving of beef.[50]

3 ounces of lean beef
173 calories
25 grams of protein

3 cups of beans
384 calories
25 grams of protein

3 cups of lentils
327 calories
25 grams of protein

9 cups of peas
326 calories
25 grams of protein



High-quality protein from lean beef helps preserve and build muscle!

One 3-ounce serving of beef provides about 50% of your recommended daily value of protein. It also provides 101% of your recommended daily value of vitamin B12, which is only found naturally in animal-source foods. The riboflavin found in beef also helps your body convert food into fuel.[6] Thanks to the efficiency of U.S. beef production, the U.S. produces enough beef to feed every American a 3-ounce serving of beef every day of the year!

A bit about beef food safety...

The beef community has a long-standing commitment to providing safe beef products for the domestic and global market. According to the Centers for Disease Control, there has been more than 90% reduction in E. coli O157 for samplings in ground beef. In 2010, the illness rate associated with E. coli dropped to less than one case in 100,000 people - meeting the government's Healthy People 2010 goal.

PORK

Pig Animal Care

Behind each pig farm, there is a community of family members and employees who are committed to animal well-being. The pork community's flagship education program for farmers and their employees is the National Pork Board's Pork Quality Assurance Plus (PQA Plus) program. Currently, more than 61,850 farmers and farm employees are PQA Plus certified.

Veterinarians regularly visit the farm.

Farmers work closely with veterinarians to care for their pigs. While they work diligently to keep their herd healthy, sometimes pigs get sick and may need antibiotics to heal. Veterinarians and farmers use antibiotics responsibly - meaning they use only what is necessary for pig health.[37]

Pig farmers take biosecurity seriously.

Farmers use biosecurity measures to ensure harmful diseases are not introduced to their pigs, This includes wearing clean coveralls and boots that are not used outside of the barn. They also shower on the way in and out of the barn.

Barns are made for pig comfort.

Pigs are typically raised indoors where they are protected from predators and disease. The barns also provide a steady, temperature controlled environment - regardless of what the weather is like outside. Most modern pig barns use mechanical systems, such as adjustable curtains and fans, to regulate the temperature and humidity levels.

Most pregnant pigs prefer their own space away from others.

Pregnant pigs are sometimes kept in gestation stalls, where they have their own space away from other pregnant pigs. Given the choice, most prefer the gestation stall over roaming around in group areas![78]

- Employees receive ongoing animal care training
- Herd management plans protect animal health
- Farmers collaborate with veterinarians

See inside a real pig barn!

Farmers make sure piglets get a healthy start.

During farrowing, sows (adult female pigs) give birth to piglets in special rooms designed to provide for the special needs of the animals. Farrowing stalls are used to reduce the number of piglets that are accidentally laid on or stepped on by the sow and allow animal caretakers to assist in the birthing process. Farmers use heating lamps or mats to keep the piglets warm and the sow cool.

Pig Environmental Stewardship

The pork community is committed to managing farms and facilities in the most environmentally responsible way possible. Conservation, recycling, land management, water quality, air quality, and manure management are priorities for pig farmers for continuous improvement.

Pig farmers are always working to minimize their environmental impact. From 1960 to 2015, pig farmers decreased: [62]

WATER USE	LAND USE	ENERGY USE	CARBON FOOTPRINT
			
25%	76%	7%	8%

How much GHG emissions come from pork?

The relative contribution from pork production to the overall national greenhouse gas inventory is extremely small, at less than 0.1% according to estimates based on the U.S. Environmental Protection Agency's 2022 greenhouse gas reports.[21]

By 2030, the U.S. pork community has pledged to reduce greenhouse emissions 40% from a 2015 baseline! Read more.

Pig farmers are actively removing more carbon from the atmosphere than they are producing! [56]

Pig farming is continuously advancing to reduce its environmental footprint. Farmers are increasingly using renewable energy sources, including methane digesters, wind turbines, and solar panels, to power their farms, decreasing their overall energy use.

Nothing goes to waste on a pig farm - not even the waste! Manure is recycled as fertilizer and can benefit soil health.

Modern pig farms have slatted flooring, keeping the barn cleaner and allowing for the manure to be easily collected in holding pits under the barn or moved to nearby manure lagoons. The manure is then strategically applied to crop fields as fertilizer based on a nutrient management plan.

By using natural manure fertilizer, farmers not only reduce their environmental footprint by decreasing the use of petroleum-based fertilizers but also greatly improve soil quality. Cover crops can also be used to slow erosion, improve soil health, increase water availability, help control pests and diseases, and increase biodiversity.

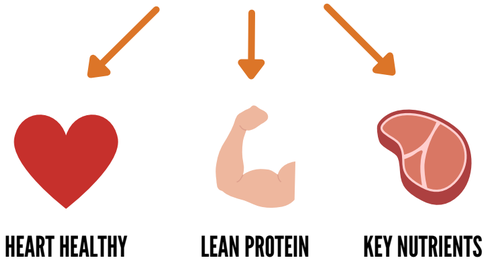
On-farm conservation practices have reduced CO2 emissions equivalent to taking 22,410 cars off the road! [56]

Pork Nutrition and Food Safety

Today's pork is 16% leaner and 27% lower in saturated fat compared to 20 years ago.[33] Several cuts of pork meet the USDA guidelines for "lean" by containing less than 10 grams of fat, 4.5 grams of saturated fat, and 95 milligrams of cholesterol per 100 grams of meat.

Pork is both a good source of protein and also provides several important vitamins and minerals.

A 3-ounce serving of pork is an "excellent" source of thiamin, selenium, protein, niacin, vitamin B6, and phosphorus, and a "good" source of riboflavin, zinc, and potassium.[33]



Looking for lean pork? Find cuts that have "loin" or "chop" in the name![79]

- Pork tenderloin
- Sirloin pork chop
- Sirloin pork roast
- New York pork chop
- Porterhouse pork chop
- Ribeye pork chop
- Pork loin roast

Pork is a source of nine key nutrients.

Riboflavin	Vitamin B12	Potassium
Zinc	Selenium	Phosphorus
Thiamin	Niacin	Vitamin B6

Tip! A 3-ounce serving of meat is about the size of a deck of cards!

Lean pork helps you reach and maintain a healthy weight by keeping you satisfied longer.

A 2014 study found the inclusion of pork in the diets of young women is associated with the reduced consumption of energy-dense, nutrient-poor foods.[28]

A bit about pork food safety...

Farmers eat the food they produce too. They want it to be safe for your family and theirs. Pig farmers ensure safe food by focusing on three main areas:

1. Using management practices that are consistent with food safety.
2. Managing the health of herds.
3. Using technologies that minimize food safety threats.

CHICKEN

Broiler Chicken Animal Care

To assist farmers and the companies who produce and process chickens for food, the National Chicken Council (NCC) developed the NCC Animal Welfare Guidelines and Audit Checklist, which have been widely adopted within the chicken community. Robust updates were made to the guidelines in 2023 and incorporated new science-based recommendations to enhance chicken welfare. NCC's broiler and broiler breeder welfare guidelines have been certified by the Professional Animal Auditor Certification Organization, a leading authority on animal welfare auditing which provides high-quality training and certification credentials for auditors and audits.

The health of broiler chickens in the U.S. continues to improve with scientific advancements in genetics, management, and nutrition.[60]

Birds go through a medically advanced screening process to ensure the healthiest and strongest go on to create the next generation of chickens. Selection for health and welfare traits is important not only to animal welfare but also to improve husbandry. The screening includes:

- A DNA test to check any genetic disorders down the line.
- A blood oxygen level test to ensure heart and lung health.
- An ultrasound station to examine the birds' breast muscles.
- An x-ray of the bird's joints to look at the bone formation and joints of each bird to have a precise evaluation of leg health.

- ✓ Monitored by licensed veterinarians.
- ✓ Raised in large barns with room to interact, eat, drink, and rest.
- ✓ Raised by farmers trained in animal welfare.
- ✓ Never raised with added hormones or steroids.

Take a look inside the life of a broiler chicken from their first day on the farm!

Chicken farmers use technology to care for their birds.

Most farmers receive remote alarm notifications through their phones, pagers, or other devices which alert them if the chickens are too hot or cold or need more food or water!

Carefully following biosecurity measures is an important tool for disease prevention in flocks.

To keep chickens safe from germs and diseases like avian influenza, farmers wear biosecure suits, hairnets, and boots, and wash their boots in a dry chlorine powder before entering the chicken house. Learn more.

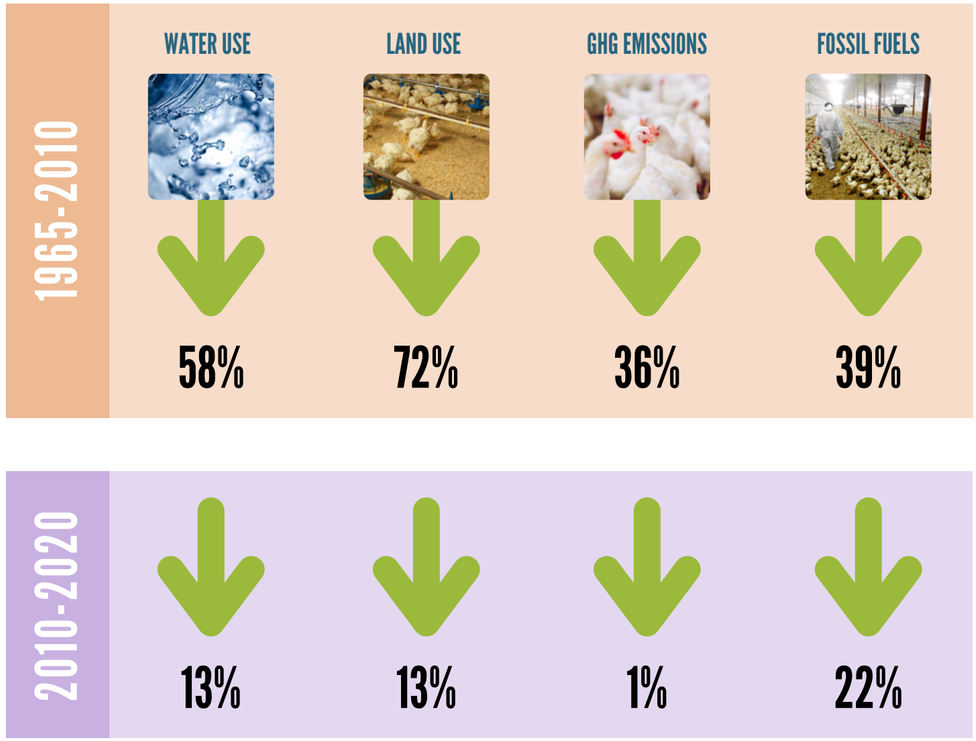
Chickens get the right nutrients at the right time with close coordination between farmers and nutritionists.

There are a number of factors that go into getting chickens to a healthy size – nutrition tailored to each stage of the chicken's life, coordination between farmers and veterinarians, and optimized living conditions – from temperature, to lighting, to litter – all contribute to the healthy growth of chickens.

Broiler Chicken Environmental Stewardship

America's broiler chicken companies and the 30,000 farm families that raise broiler chickens are committed to the responsible production of food that is safe, affordable, and abundant for consumers in the U.S. and around the world. The chicken community is more diligent and innovative than ever in pursuing environmental improvements.

Technology, modern breeding, nutrient management, feed conversion, and improved animal care practices have helped chicken farmers to significantly reduce the use of natural resources![20]



Poultry litter can be one of the most valuable assets on the farm.

Unless there is a biosecurity concern, poultry litter is cleaned and reused in between flocks. The litter is ultimately recycled as organic fertilizer for cropland and when managed effectively, can benefit soil health and crop growth.

Over 95% of poultry litter is recycled and reused to fertilize crops.

Energy-saving innovations, such as solar panels and LED lights, and water-saving tools like cooling pads, help chicken farmers limit the environmental impact of running a successful farm, all while benefiting the overall wellbeing of their flock.[67]

What does sustainability mean to chicken farmers?

Are slower-growing chickens really better?

In recent years, there has been interest in slower-growing chickens, but this is not a smart choice for environmental stewardship or animal welfare. If only one-third of broiler chicken farmers switched to a slower growing breed, nearly 1.5 billion more birds would be needed annually to produce the same amount of meat currently produced – requiring a tremendous increase in water, land, and fuel consumption.[45] Not to mention, 64 million fewer people would be fed chicken each year - equal to the combined population of California and Texas!

Chicken Nutrition and Food Safety

Chicken is the cornerstone of a healthy and well-balanced diet. Whether you choose to spend your food dollars on conventional chicken, organic, or chicken raised without antibiotics, you can be confident in its wholesomeness and safety.

Skinless, boneless chicken breast is protein-packed and low in fat.

One 3-ounce serving of skinless, boneless chicken breast has 126 calories, 25 grams of protein, and only 2.9 grams of total fat. Drumsticks are another popular choice with just 156 calories and 20 grams of protein![61]

One serving of chicken has nine essential nutrients.

Chicken is a source of niacin, riboflavin, vitamin B6, phosphorus, selenium, zinc, vitamin B5, potassium, and vitamin B12. It is considered an “excellent” source of niacin as one serving has 87% of the recommended daily value![27]

A 3-ounce serving of chicken has nearly the same amount of potassium as one cup of orange juice![50]

Eating chicken can actually help boost your mood and aid in weight loss!

Chicken contains tryptophan, an amino acid that is responsible for raising serotonin levels in your brain. Serotonin is known as a “feel-good” neurochemical linked with mood. Raising serotonin levels means a boost in your overall mood![31]

On top of that, lean meats like chicken are excellent sources of protein. High-protein foods have been shown to support weight management and blood sugar levels.[80,81]

A bit about chicken food safety...

Chicken farmers, veterinarians, and producers are committed to innovation and using the latest science to ensure the safety and health of their flocks - and thereby our food supply. According to the United States Department of Agriculture (USDA) Food Safety and Inspection Service (FSIS), from June 2024 through June 2025, more than 86% of whole chickens tested negative for Salmonella, and almost 89% of chicken parts tested negative.[39]

EGGS

Laying Hen Animal Care

Hens under the United Egg Producers Certified program account for more than 90% of all the nation's laying hens. Egg farms under this program are independently audited annually based on guidelines recommended by a committee of world-renowned scientists in areas of food safety and animal welfare. Though in recent years many grocers, manufacturers, and restaurants have announced a transition to cage-free egg production, the layer community has made considerable advancements in all major housing systems – conventional cages and cage-free barns.

Egg farmers, farm employees, and veterinarians take biosecurity seriously. They work together to keep flocks healthy by taking simple steps to protect birds from diseases like avian influenza.

BIOSECURE SUITS

Farm workers and visitors must wear special suits to protect the birds from germs.

DISINFECT TRUCKS

Trucks entering the farm are disinfected and parked away from the barns.

FOOT WASH STATIONS

Farm workers and visitors must wash their shoes or wear designated boots.

HAND WASH STATIONS

Farm workers and visitors must wash their hands before entering the barn.

NO PET BIRDS

Farm employees are not allowed to have birds at home.

48-72 HOURS

Farm workers and visitors cannot go to other farms within 48-72 hours of each other.

Barns are specifically designed for hen care and well-being.

Hens are raised indoors to protect them from predators and illnesses they may catch from wild birds. Hens have access to feed formulated by animal nutritionists and enough space based on scientific recommendations.

Cage-free barns have areas for birds to exhibit natural behaviors such as nesting, perching, and dust bathing.[23]

Learn more about the types of hen housing systems!

Climate-controlled barns.

Continuous access to food and water.

Workers receive ongoing animal care training.

Protection from outside predators.

Laying Hen Environmental Stewardship

The egg community has made great strides in environmental stewardship over the years and is always working to continuously improve their practices to become more efficient and environmentally-friendly.

Egg farmers understand they have an ethical obligation to care for the environment.

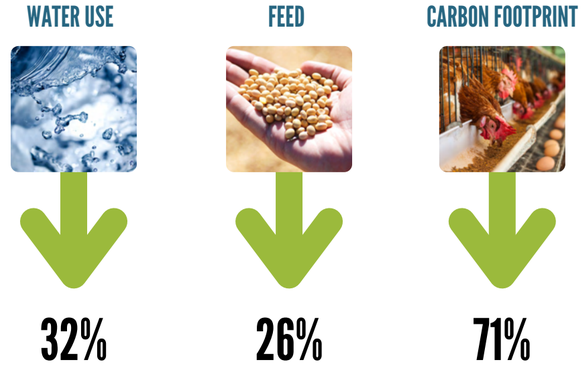
Improvements in hen housing and manure management have helped egg farmers reduce their energy use and emissions. Egg farmers have a 31% lower cumulative energy demand and 65% lower acidifying emissions compared to 1960.[38] They have made impressive achievements in the last 50 years and are working to reduce their environmental impact even more over the next 50 years!

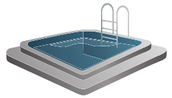
Compared to 1960, today's egg farmers are able to feed 72% more people.

Today's hens are living longer and producing 27% more eggs per day because of better health, nutrition, and housing. Although they produce more eggs, they are using less than 50% of the feed it took to produce a dozen eggs in 1960.[38] Egg farms are using fewer resources and producing less waste too!

What does environmental stewardship look like on an egg farm?

Compared to 1960, egg farmers have made significant strides in minimizing their environmental impact with the help of technological advancements and improved animal care practices.[38]



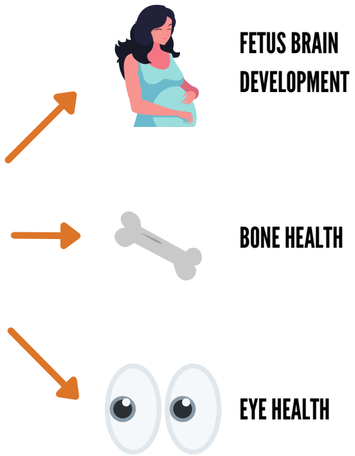


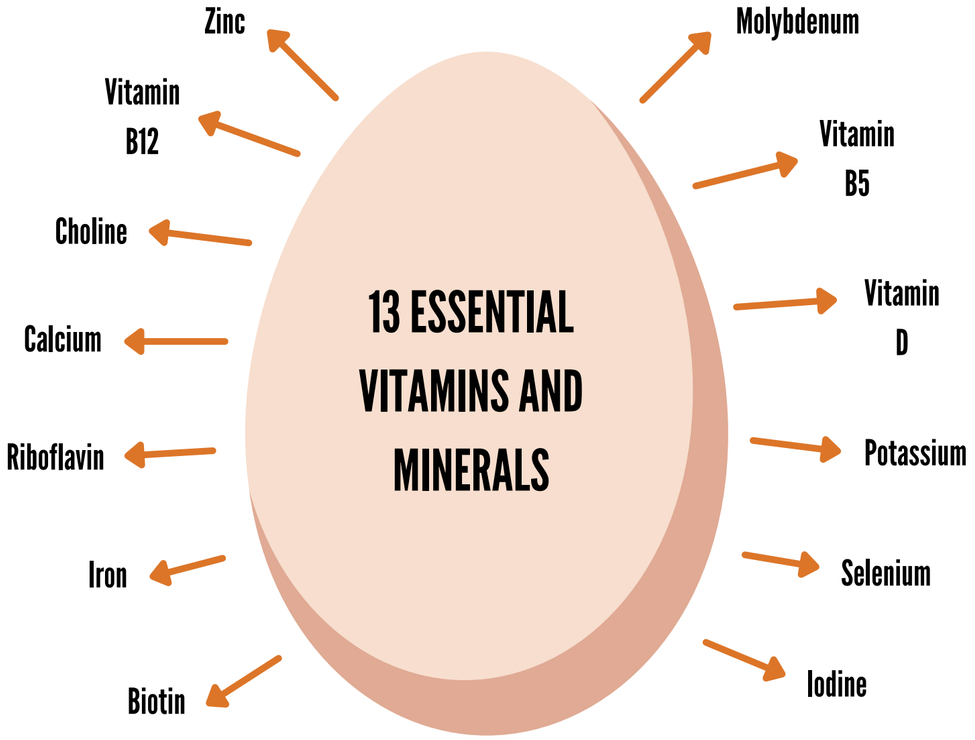
The amount of water egg farmers have conserved would fill 3,716 Olympic-sized swimming pools![38]

The amount of CO2 reduced by egg farmers since 1960 is equivalent to taking 5.2 billion cars off the roads for a year![38]

Egg Nutrition and Food Safety

One large egg has varying amounts of 13 essential vitamins and minerals, six grams of protein, and only 70 calories.[12] With a package like that, it's no wonder they are considered nature's multivitamin!





While the egg white has some protein, selenium, and riboflavin, most of the egg's nutrients are in the yolk!

An egg's yolk has choline which is important for pregnancy as it aids in healthy brain development of the fetus. Other key nutrients in eggs are vitamin D, which is crucial for bone health, and lutein, an antioxidant which helps prevent cataracts! [12]

A bit about egg safety...

Egg farmers with conventional, cage-free, free-range, and organic housing systems have been working toward reducing pathogens like Salmonella Enteritidis (SE) on the farm for more than 10 years. After the initial inspections in 2011, only approximately 2.5% of the environmental samples nationwide were positive for SE for egg farmers.

Myth: Eggs have too much cholesterol.

Although eggs do have cholesterol, the most recent nutrition data shows it is lower than previously recorded. More than 40 years of research shows that healthy adults can enjoy eggs without impacting their risk of heart disease.[40]

Myth: Brown eggs are fresher and healthier than white eggs.

Egg color does not contribute to freshness or nutritional value. Color depends on the breed of hen that laid the egg. The nutritional value of the egg is more closely linked to the hen's diet! [74]

TURKEY

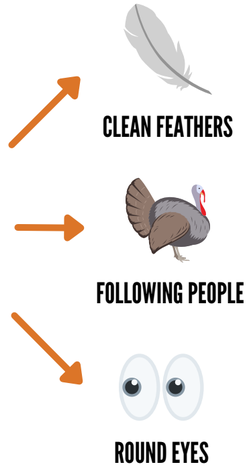
Turkey Animal Care

Each year, about 218 million turkeys are raised on approximately 2,500 farms across the U.S. On these farms, animal care is a top priority. The National Turkey Federation (NTF) provides turkey farmers with animal welfare guidelines, the NTF Standards of Conduct, to ensure management practices are used that fall in line with research in animal welfare and expert recommendations. The NTF guidelines were first developed in 1990 and most recently updated in 2021.

Farmers walk through the barns to check on the turkeys every day.

Farmers look for clean feathers, round, prominent eyes, and that the turkeys are following them through the barn to signal the birds are healthy. Turkeys are raised in specially-designed, climate-controlled barns that provide maximum space and protect them from weather, insects, rodents, predators, and people who might spread disease, such as avian influenza. Except for breeding and transportation purposes, turkeys are allowed to roam freely within their house.[35]

Get an inside look at a Texas turkey farm!



Turkey health and well-being is important to farmers.

Turkeys are fed a healthy diet of whole and pelleted grains with vitamins and and minerals. They always have access to food and fresh water. Additionally, turkey farmers follow strict biosecurity plans including foot wash stations, pest control, and equipment disinfection to ensure the safety of their flocks from disease.

Farmers work closely with their veterinarians to ensure all birds receive great care on the farm.

Today, all poultry farms are under a health program designed by a licensed veterinarian. But just like people, animals sometimes get sick, and treating illness is a responsible part of animal care. When this happens, farmers work with animal health experts and veterinarians to determine if an antibiotic is needed. The vast majority of the antibiotics that are used to treat turkeys are never used in human medicine, and the turkey community is taking steps to phase out those most critical to human medicine.[35]

Turkey farmers make sure everything is just right for when the turkeys arrive.

On the day that poults (baby turkeys) arrive to the farm, the barn is set at a tropical 85 degrees! The temperature is gradually lowered to about 70 degrees by the fifth or sixth week.[35]

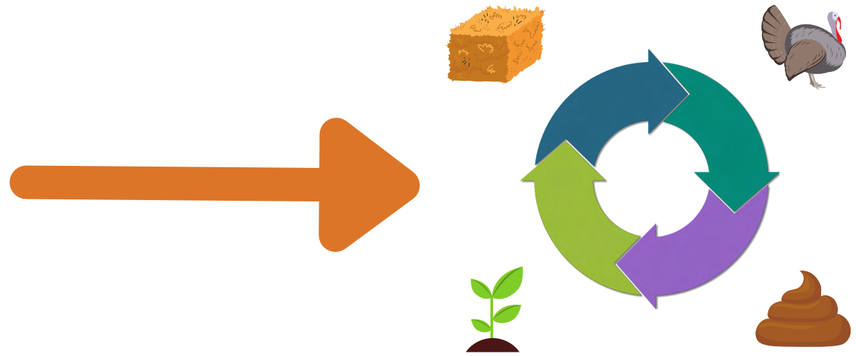
Turkey Environmental Stewardship

Turkey farmers make sure their birds have a healthy living environment inside the barns while also taking care of the land outside of the barns. As members of the U.S. Roundtable for Sustainable Poultry & Eggs, NTF and the turkey community value the proper use of natural resources. Using modern technology helps them to provide safe, affordable, and healthy foods to feed families across the world.

Farmers recycle turkey litter as fertilizer for nearby soybean and corn fields.

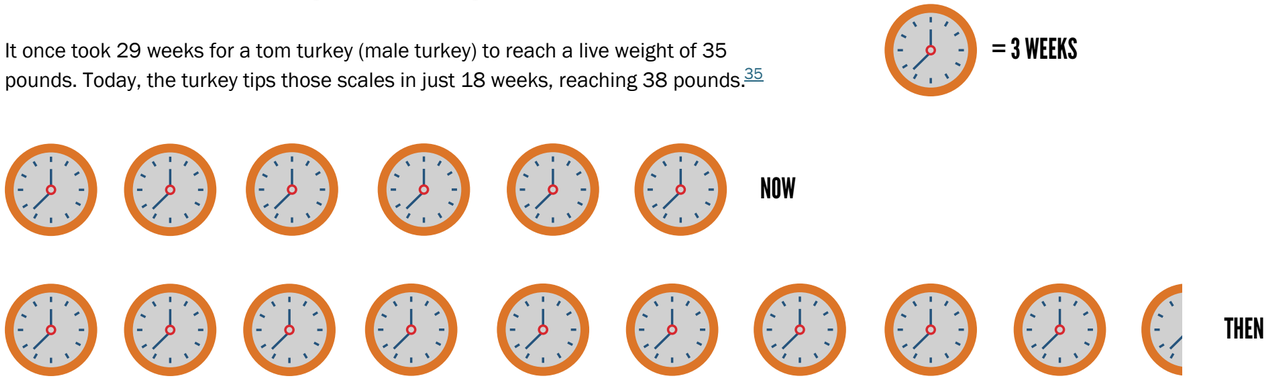
Roughly 218 million turkeys are raised each year in the U.S. With that many birds there is also a lot of manure! The soybeans and corn that go into turkey feed come from nearby farms - some turkey farmers raise turkeys and grow crops. Farmers take the litter (manure and turkey bedding) and carefully apply it to cropland as organic fertilizer.[35]

Careful management ensures that litter is used in accordance with the nutritional needs of crops, so that nutrient enrichment of groundwater and surface water is eliminated or minimized.



Improvements in genetics and nutrition have helped turkeys grow healthier and reach market weight faster - using fewer resources!

It once took 29 weeks for a tom turkey (male turkey) to reach a live weight of 35 pounds. Today, the turkey tips those scales in just 18 weeks, reaching 38 pounds.[35]



Turkey farmers are always looking for new ways to care for the environment. Improving genetics helps farmers raise the best bird while using fewer natural resources.

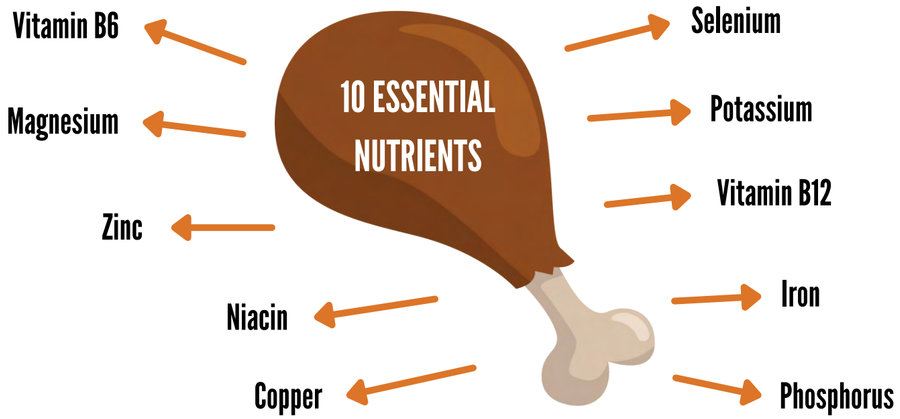
Lower feed requirements reduce the demand for corn and soybeans. This efficiency also aids in lowering the fuel consumption and exhaust emissions of the tractors and trucks that harvest and bring the grain to market.[35]

Turkey Nutrition and Food Safety

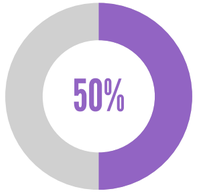
Turkey is a favorite during the holidays, but it is a healthy, convenient, and affordable choice all year. Delicious, versatile, and available in a variety of cuts, turkey is naturally low in fat and provides immune-boosting nutrients like iron, zinc, and potassium. It's also packed with lean protein to keep people feeling full longer and satisfy their appetite for health and fitness.

Turkey is a great source of 10 essential nutrients.

A 3-ounce serving of boneless, skinless turkey breast contains just one gram of fat and no saturated fat. Turkey also has 10 essential nutrients which help build strong bones, support a healthy nervous system, promote thyroid function, and more.[68]



- Low calorie and low fat
- Lean protein
- Nutrient-dense



One serving of turkey gives you 50% of your recommended daily value of protein!

A 3-ounce serving of turkey provides 26 grams of high-quality protein. Protein helps keep you full longer, which can prevent overeating.[50]

A bit about turkey food safety...

Food safety is a top priority for the turkey community. The National Turkey Federation has placed an enhanced focus on addressing the challenges presented by salmonella and other naturally-occurring pathogens, including driving down salmonella's occurrence throughout the turkey chain of production to achieve the lowest incident rate possible among raw poultry products.

LAMB

Sheep Animal Care

Farmers and ranchers who raise sheep in the U.S. take great pride in the care they provide for their animals. The Sheep Care Guide, sponsored by the American Sheep Industry Association, was originally published in 1996 and is revised every few years to include new research findings regarding animal care.

Shearing sheep is nothing more than a haircut and helps the animal stay comfortable and healthy. Sheep also provide us with warm clothing!

As long as there are sheep, shearing must be practiced for the health and hygiene of each individual animal.[3] Unlike other animals, most sheep are unable to shed. If a sheep goes too long without being shorn, a number of problems occur:

- Excess wool impedes the ability of sheep to regulate their body temperatures.
- Sheep with large amounts of wool can become immobilized.
- Urine, feces, and other materials become trapped in the wool.

A lifecycle assessment of wool sweaters found that the greatest way to reduce the environmental impact of the clothing item is to wear it more often and keep it longer! Once a wool garment reaches the end of its life, it also biodegrades back into the environment![63]

Farmers keep detailed health, nutrition, and wellness records.

Regular monitoring of health, body condition, and growth rates allows farmers to evaluate the adequacy of flock nutritional programs.

Understanding sheep behavior improves animal care and handling.

The instinctive nature of sheep to flock, coupled with quiet and calm movements, is utilized when moving sheep.

Farmers pair their flocks with dogs, llamas, or donkeys to keep them safe from coyotes!

Lambs are vulnerable to many predators including coyotes, wolves, mountain lions, and bears. Farmers protect their flocks with the help of guardian dogs, donkeys, and llamas.

The majority of sheep farms and ranches are family-owned.

94% of sheep farms are family-owned. There are more than 88,000 family farms and ranches caring for over 5 million sheep throughout the United States![22]

Sheep Environmental Stewardship

Sheep farmers are dedicated to not only their animals but the environment in which they raise them as well. Sheep's natural grazing skills bring many benefits to the environment in which they live.

Sheep help us reduce waste in our environment!

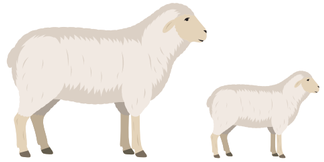
Numerous waste materials contain nutrients that sheep can use to thrive. Among these are crop residues, grass clippings, and food processing byproducts that would otherwise be considered garbage. Some waste management experts estimate that 60% of landfill waste are organic substances from the yard. Feeding select wastes to sheep can help reduce the burden on the nation's overflowing landfills while converting the refuse into products such as wool, meat, manure, lanolin, and milk for cheese.[4]

Have you heard through the grapevine...

Many vineyards and solar panel farms are using sheep to manage weeds without the use of herbicides.

Wool products are fire resistant!

Wool products are fire resistant to protect soldiers, police, and firemen from fire dangers!



Grazing can prevent wildfires and manage noxious weeds.

Sheep's natural grazing skills make them ideal for controlling weeds naturally and for preventing fires by clearing undergrowth in forests and woodland areas.[34]

Sheep improve land quality.

Sheep improve pasture and rangeland quality by recycling nutrients back into the soil and sequestering carbon, minimizing erosion, and encouraging native plant growth.[34] They can also eat plants that are toxic to other livestock.

Grazing can enhance wildlife habitats.

Sheep grazing is a promising tool for enhancing wildlife habitats. Sheep foraging habits help create and maintain biological diversity.[34]

Sheep help promote healthy forests.

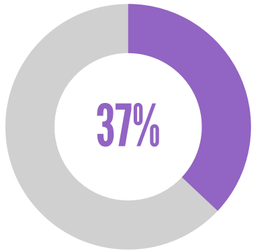
In California, Oregon, Washington, and Canada, sheep grazing in forest plantations can double the number of healthy trees and increase each tree's growth by 30% compared with areas not grazed.[34]

Lamb Nutrition and Food Safety

Lamb is a nutrient-rich food and an excellent source of vitamin B12, selenium, zinc, and niacin. It is also a great source of healthy, unsaturated fats with nearly 40% of the fat in lean lamb being heart-healthy monounsaturated fat. Lean cuts of lamb include the leg and loin.[32]

Leg of lamb is lean with about 150 calories per serving.

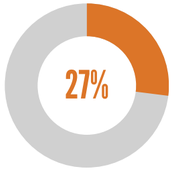
The classic leg of lamb comes from the hind quarter, is the most versatile cut, and also one of the most economical. Providing lots of cooking options, leg of lamb can be butterflied, cubed (for kabobs), or cut into sirloin chops or steaks. Bone-in leg of lamb makes an impressive dish for a celebratory meal.



A 3-ounce serving of lamb provides 37% of the recommended daily value of vitamin B12.

Vitamin B12 is only found naturally in animal products and supports many important metabolic functions. Vitamin B12 deficiency may lead to anemia or neurological problems such as difficulty walking, memory loss, and disorientation.[32]

A serving of lamb provides 30% of the recommended daily value of zinc which supports a healthy immune system.[32]



A serving of lamb also provides 27% of the recommended daily value of niacin which aids in many metabolic functions.[32]

One serving of lamb has 38% of the recommended daily value of selenium which helps protect your cells from damage.[32]

A bit about lamb food safety...

Sheep and lamb farmers are not only committed to providing a quality fiber but also a wholesome food supply. All lamb is either USDA inspected for wholesomeness and quality or inspected by state systems equal to the federal government standards.

Lamb has healthy omega-3 fatty acid!

One serving of lamb provides about 100 milligrams of the essential omega-3 fatty acid alpha-linolenic acid! [32]

RIBOFLAVIN | VITAMIN B6 | COPPER | PHOSPHORUS | MAGNESIUM

IRON | POTASSIUM | VITAMIN B5 | THIAMIN

SEAFOOD

Aquaculture Animal Care

Aquaculture is the breeding, planting, rearing, and harvesting of domesticated aquatic animals and plants in contained systems such as man-made ponds, outdoor raceways, indoor tanks or raceways, or protected in cages, net bags, or sea cages in coastal waters and oceans. Today, aquaculture is the fastest growing segment of agriculture in the U.S. with America's farmers growing a variety of freshwater and marine fish, shellfish, crustaceans (shrimp and crab), reptiles, aquatic plants, seaweeds, and other invertebrates (corals) for a variety of markets including food, bait, aquaria and water gardens, and fisheries management.[16]

Good nutrition is important to promote optimal fish growth and health.

Fish can be fed by hand or with automatic feeders. Farmers monitor the feeding of fish every day to ensure they are healthy. Fish feed can either be made to float or sink, depending on the preference of the fish it is made for. For example, shrimp only like feed that sinks, but most other fish will eat floating feed. U.S. grown soybean and corn are important fish feed ingredients.

All fish feed is formulated with just the right amount of vitamins and minerals, including vitamins A, D, E, and C, choline, riboflavin, biotin, and niacin. Vitamin C is one of the most important vitamins for fish as it helps enhance their immune systems.[10]

Raceways are tanks that flow in a single direction and create currents similar to those found in rivers

Fish are raised in man-made systems like ponds, tanks, or net pens.

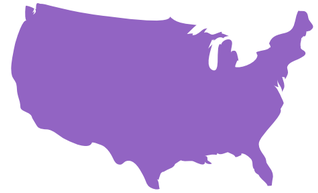
Farm-raised fish start in hatcheries and are then moved to ponds, raceways, tanks, or net pens, depending upon the species. A catfish pond is typically 10 acres or less with a depth of 5 to 10 feet.[13]

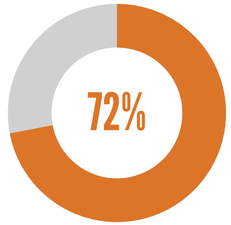
Net pens are enclosed, floating pens often used in marine aquaculture

The U.S. ranks 18th in aquaculture production.

In 2022, estimated freshwater plus marine U.S. aquaculture production was 663 million pounds with a value of $1.7 billion. The top U.S. marine aquaculture species are oysters, Atlantic salmon, and clams, and the top freshwater species are catfish, crawfish, and trout.[17]

97% of U.S. farm-raised catfish is raised in Alabama, Arkansas, Mississippi, and Texas.[11]





72% of U.S. farm-raised trout is raised in Idaho.

Normally when people think of Idaho, potatoes come to mind, but the vast majority of farm-raised trout also comes from the state. Idaho's success is linked to a vast system of aquifers and springs![1]

Aquaculture Environmental Stewardship

Experts agree that the future of sustainable seafood must involve both farm-raised and wild-caught fish. Sustainable seafood is seafood caught or grown in a manner that satisfies the nutritional needs of the current generation without reducing the ability to satisfy the needs of future generations.

Shellfish, like oysters and clams, improve water quality and protect other organisms in their ecosystem.

When it comes to environmental stewardship, oysters, clams, mussels, and scallops are natural filters. By feeding on phytoplankton and nutrients, these shellfish purify water and help clean coastal waters. Shellfish can also act like reefs, providing habitats and protection for other organisms such as juvenile fish, crabs, and lobsters.[42]

Aquaculture operates under strict environmental protections.

U.S. fish farms operate under some of the world's most robust environmental protections, producing environmentally safe and sustainable sources of seafood.[82] To prevent the release of uneaten feed or nitrogen and phosphate compounds, farmers closely monitor feed consumption, provide feeds that are efficiently converted to protein, and treat production water that may be released from the farm to meet or exceed strict state and federal water quality protections.[47]

Fish farms are always working to reduce, reuse, and recycle their water.

Fish farmers understand their ethical obligation as stewards of not only the land but also the water. They are continuously working to use water efficiently, make sure their farms are environmentally-friendly, and that when water is used to grow the fish and returned to streams and rivers, it is returned cleaner than when it entered the farm.

Aquaculture can help balance marine ecosystems.

According to the National Oceanic and Atmospheric Administration, marine aquaculture in the U.S. contributes to seafood supply, supports commercial fisheries, restores marine habitats and at-risk species, and maintains economic activity in coastal communities and at working waterfronts in coastal states.

82% of aquaculture feed ingredients are byproducts or coproducts that are upcycled from other industries.[54]

62% of our seafood will come from aquaculture by 2030.[19]

Seafood Nutrition and Food Safety

Seafood provides a variety of health benefits due to its supply of vital nutrients like omega-3s, which our bodies do not create on their own, and serving as a source of lean protein that is low in calories and saturated fat. Seafood has several essential nutrients, including iodine, selenium, calcium, vitamin B12, A, D and E, zinc, and iron.

Seafood is packed with nutrients to help your body function optimally and you feel your best!

Seafood is nutrient-dense with healthy omega-3 fatty acids which help protect the heart, brain, and eyes. Fish, shrimp, and other seafood have also been found to be a good source of vitamin D which is important in the prevention of osteoporosis and improving bone density. Iodine is found in most seafood and aids in effective thyroid gland function, which impacts normal growth, metabolism, and the development of the central nervous system.[29]

The omega-3 fatty acid DHA can help boost your mood. High fish consumption can reduce the risk of depression![26]

Seafood provides vitamin E, which is an antioxidant important for healthy skin!

Adults who eat a diet high in fish can slow their brain aging by as much as five years![15]

Seafood consumption is beneficial to pregnant women and their children.

Eating seafood can help in fetus brain and eye development. Women who are pregnant or breastfeeding should eat at least 8 ounces of seafood per week for omega-3 fatty acid to improve infant health outcomes.[2]

A USDA study found that 80-90% of Americans are not eating enough seafood.[24]

The 2020-2025 Dietary Guidelines for Americans recommends the general population should eat at least 8 ounces of seafood per week. Popular recommendations include salmon, tilapia, shrimp, and catfish.[2]

A bit about seafood safety...

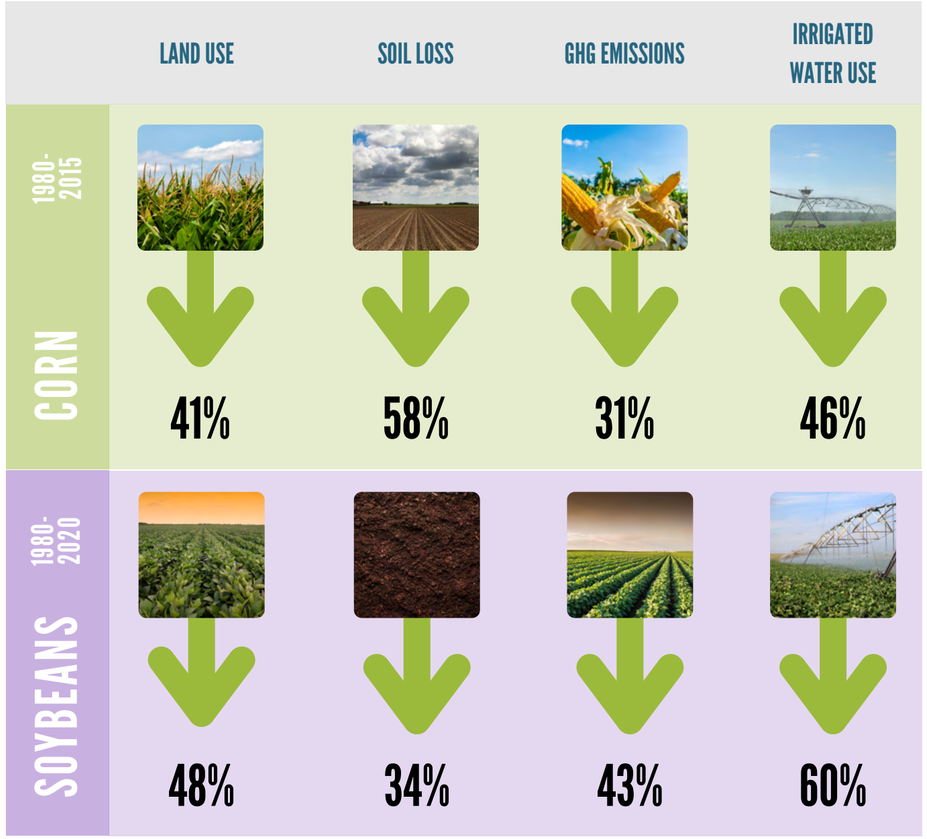
Seafood safety is overseeen by the FDA's Hazard Analysis and Critical Control Point standards. The system is internationally recognized as one that successfully identifies where hazards might happen and puts in place measures to prevent them from occurring. Each step in the process is strictly monitored and controlled.[41]

ANIMAL FEED

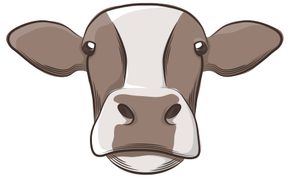
Animal Feed Environmental Stewardship

Every sector of animal agriculture is on a continuous journey to reduce its environmental impact - and that includes the farmers and ranchers growing animal feed ingredients. The Institute for Feed Education and Research has partnered with the American Feed Industry Association and its members to develop a Sustainability Road Map with the goal of giving animal feed and pet food manufacturers a solid starting point for reducing their environmental impacts and helping consumers feel good about where their food comes from. The top animal feed ingredients include corn, soybean meal, dried distiller's grains, wheat middlings and wheat bran, and corn gluten meal.[54]

Since 1980, corn and soybean farmers have worked to reduce their environmental impact: [70,71]



In 1980, 86% of all U.S. domestic-use corn was fed to livestock. In 2023, less than 40% was fed to animal agriculture.[72]



80% of what cows eat cannot be eaten by people - we simply can't digest it![73]

More than 37% of ingredients used in animal feeds are upcycled from other industries! [54]

Citrus pulp

Rice bran and mill feed

Cottonseed and cottonseed meal

Brewer's grains

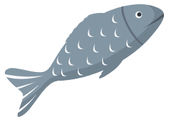
Potato tubers, peels, and pulp

Carrot tops

Sunflower meal

Beet pulp

Almond hulls



Fish meal

The U.S. animal feed community is diligently working to advance sustainability programs across the industry.

These efforts are being advanced through the Institute for Feed Education and Research, responding to product stakeholders' transparency needs, and communicating sustainability stories to a variety of audiences.

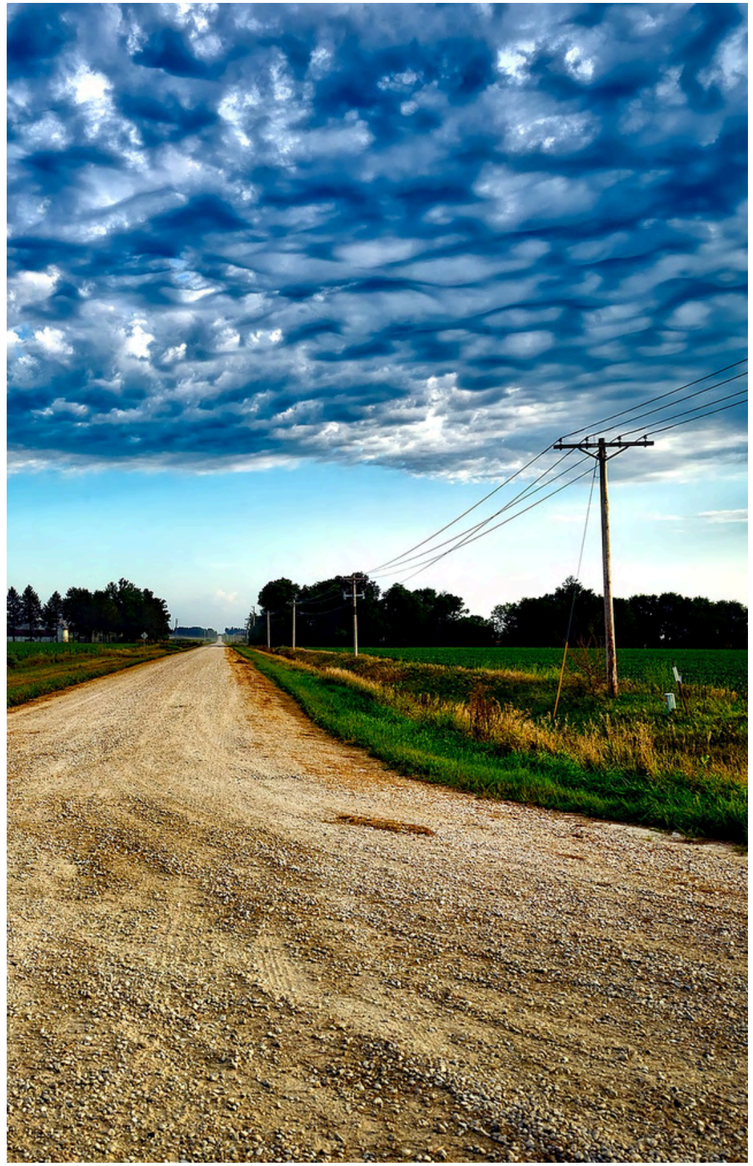
Looking to the future.

Animal agriculture has made impressive achievements in the last 25-50 years in areas of animal care, environmental stewardship, responsible antibiotic use, nutrition, and food safety. The improvements and advancements will only continue as more research and technology become available. With a rapidly increasing population, farmers, ranchers, veterinarians, animal nutritionists, animal health companies, and everyone in the animal agriculture community is uniting to produce more food with fewer resources. With about 40% of U.S. land categorized as farmland, nearly half of our nation's land is in the hands of farmers and ranchers.[1] This means agriculture is a key player in moving our nation towards a greener tomorrow.

Some critics claim meat, dairy, poultry, eggs, and seafood can be removed from the diet to save the planet and our health. Claiming a seemingly simple solution as the cure for human and planetary health is not only misguided but irresponsible. There is not a simple solution because simple solutions only work for simple issues. Mitigating climate change or improving overall human health are complex issues and thus require a robust, multi-faceted approach including cooperation and involvement from every industry, country, and government entity.

Ignoring the benefits of animal protein in diets or the tremendous strides that the animal agriculture community has made in reducing the impact on the environment is both a disservice to consumers and America's hardworking farmers and ranchers. This is not a time to point fingers but a time to ensure our future generations have the luxury of a sustainable food system and planet. The animal agriculture community's track record in continuous improvement has earned them a seat at the table.

The Animal Agriculture Alliance has compiled a third-party expert contact list for anyone interested in learning more about a specific species or issue mentioned in this report. Email us at info@animalagalliance.org to view the list.



Animal Agriculture Alliance

Connect | Engage | Protect

The Animal Agriculture Alliance safeguards the future of animal agriculture and its value to society by bridging the communication gap between the farm and food communities.

We connect key food industry stakeholders to arm them with responses to emerging issues.

We engage food chain influencers and promote consumer choice by helping them better understand modern animal agriculture.

We protect by exposing those who threaten our nation's food security with damaging misinformation.

References

1. 2022 Census of Agriculture | USDA/NASS. (n.d.). Retrieved April 8, 2024, from https://www.nass.usda.gov/Publications/AgCensus/2022/index.php

2. Dietary Guidelines for Americans. (n.d.). Retrieved March 30, 2021, from https://www.dietaryguidelines.gov/

3. American Sheep Industry | Animal Welfare. (n.d.). Retrieved August 5, 2025, from https://www.sheepusa.org/education-resources/animal-welfare

4. American Sheep Industry | Fast Facts About Sheep By Products. (n.d.). Retrieved April 14, 2023, from https://www.sheepusa.org/wp-content/uploads/2023/03/Fast-Facts04-Byproducts.pdf

5. Animal Care & Housing. (n.d.). Retrieved January 4, 2019, from http://www.americanveal.com/animal-care-housing/

6. Beef - It's What's For Dinner - Beef Nutrients. (n.d.). Retrieved January 8, 2019, from https://www.beefitswhatsfordinner.com/nutrition/beef-nutrients

7. Capper, J. L. (2011). The environmental impact of beef production in the United States: 1977 compared with 2007. Journal of Animal Science, 89(12), 4249–4261. https://doi.org/10.2527/jas.2010-3784

8. de Ondarza, M. B., & Tricarico, J. M. (2021). Nutritional contributions and non-CO2 greenhouse gas emissions from human-inedible byproduct feeds consumed by dairy cows in the United States. Journal of Cleaner Production, 315, 128125. https://doi.org/10.1016/j.jclepro.2021.128125

9. Koski, L., Kisselburgh, H., Landsman, L., Hulkower, R., Howard-Williams, M., Salah, Z., … Nichols, M. (2022). Foodborne illness outbreaks linked to unpasteurised milk and relationship to changes in state laws – United States, 1998–2018. Epidemiology and Infection, 150, e183. doi:10.1017/S0950268822001649

10. Understanding Fish Nutrition, Feeds, and Feeding. (n.d.). Retrieved September 18, 2025, from https://vtechworks.lib.vt.edu/items/1dac621a-44d6-4f4e-9c5f-1371c05f2fdc

11. Catfish and Trout Production and Sales by Species and Size Category: 2023 Retrieved September 9, 2025, from https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/Aquaculture/aqua_1_014_014.pdf

12. Egg Nutrition Facts. (n.d.). American Egg Board. Retrieved March 11, 2022, from https://www.incredibleegg.org/nutrition/egg-nutrition-facts/

13. Farming & Processing. (n.d.). Retrieved January 2, 2019, from https://www.uscatfish.com/our-industry/

14. Fast Facts About Agriculture - The Voice of Agriculture - American Farm Bureau Federation. (n.d.). Retrieved December 31, 2018, from https://www.fb.org/newsroom/fast-facts

15. Gu, Y., Brickman, A. M., Stern, Y., Habeck, C. G., Razlighi, Q. R., Luchsinger, J. A., Manly, J. J., Schupf, N., Mayeux, R., & Scarmeas, N. (2015). Mediterranean diet and brain structure in a multiethnic elderly cohort. Neurology, 85(20), 1744–1751. https://doi.org/10.1212/WNL.0000000000002121

16. Fisheries, N. (2021, August 13). Understanding Marine Aquaculture | NOAA Fisheries (National). NOAA. https://www.fisheries.noaa.gov/insight/understanding-marine-aquaculture

17. Fisheries, N. (2022, November 8). Fisheries of the United States, 2020 | NOAA Fisheries (National). NOAA. https://www.fisheries.noaa.gov/resource/document/fisheries-united-states-2020

18. Meat, eggs and milk essential source of nutrients especially for most vulnerable groups, new FAO report says. (n.d.). Newsroom. Retrieved August 11, 2025, from https://www.fao.org/newsroom/detail/meat-eggs-and-milk-essential-source-of-nutrients-new-fao-report-says-250423/en

19. Global Seafood Alliance. (n.d.). Retrieved March 11, 2022, from https://www.globalseafood.org/

20. National Chicken Council | 2020 U.S. Broiler Chicken Industry Sustainability Report. (n.d.). National Chicken Council. Retrieved March 11, 2022, from https://www.nationalchickencouncil.org/industry/sustainabilityreport/

21. 2022 EPA Emissions Inventory Highlights Agriculture's Sustainability Strides. (n.d.). American Farm Bureau Federation. Retrieved August 8, 2025, from https://www.fb.org/market-intel/2022-epa-emissions-inventory-highlights-agricultures-sustainability-strides

22. Fast facts about sheep production. (2025). Retrieved August 5, 2025, from https://www.sheepusa.org/wp-content/uploads/2025/02/Fast-Facts-2025-Sheep-Production.pdf

23. Hen Housing Diagrams (n.d.). Retrieved March 11, 2022, from https://uepcertified.com/wp-content/uploads/2021/08/Hen-Housing-Diagrams.pdf

24. Jahns, L., Raatz, S., Johnson, L., Kranz, S., Silverstein, J., & Picklo, M. (2014). Intake of Seafood in the US Varies by Age, Income, and Education Level but Not by Race-Ethnicity. Nutrients, 6(12), 6060–6075. https://doi.org/10.3390/nu6126060

25. Keast, D. R., Fulgoni, V. L., Nicklas, T. A., & O'Neil, C. E. (2013). Food Sources of Energy and Nutrients among Children in the United States: National Health and Nutrition Examination Survey 2003–2006. Nutrients, 5(1), 283–301. https://doi.org/10.3390/nu5010283

26. Li, F., Liu, X., & Zhang, D. (2016). Fish consumption and risk of depression: a meta-analysis. Journal of epidemiology and community health, 70(3), 299–304. https://doi.org/10.1136/jech-2015-206278.

27. Mandel, M. (2015, January 13). Chicken (White Meat). Retrieved January 1, 2019, from https://www.menshealth.com/nutrition/a19527400/white-meat-chicken-nutrition-facts/

References

28. McArthur, J. O., Gough, N. M., Petocz, P., & Samman, S. (2014). Inclusion of Pork Meat in the Diets of Young Women Reduces Their Intakes of Energy-Dense, Nutrient-Poor Foods: Results from a Randomized Controlled Trial. Nutrients, 6(6), 2320–2332. https://doi.org/10.3390/nu6062320

29. McManus, A., & Newton, W. (2011). Seafood, nutrition and human health: A synopsis of the nutritional benefits of consuming seafood. Retrieved December 31, 2018, from https://espace.curtin.edu.au/handle/20.500.11937/32912

30. McNeill, S. H. (2014). Inclusion of red meat in healthful dietary patterns. Meat Science, 98(3), 452–460. https://doi.org/10.1016/j.meatsci.2014.06.028

31. Jenkins, T. A., Nguyen, J. C. D., Polglaze, K. E., & Bertrand, P. P. (2016). Influence of Tryptophan and Serotonin on Mood and Cognition with a Possible Role of the Gut-Brain Axis. Nutrients, 8(1), 56. https://doi.org/10.3390/nu8010056

32. Nutrition. (2014, December 11). Retrieved March 11, 2022, from https://www.americanlamb.com/nutrition-1

33. Nutrition. (n.d.). Retrieved December 20, 2018, from https://www.pork.org/cooking/nutrition/

34. American Sheep Industry | Fast Facts About Sheep Ecology. (n.d.). Retrieved April 14, 2023, from https://www.sheepusa.org/wp-content/uploads/2023/03/Fast-Facts06-Ecology.pdf

35. Raising America's Turkeys. (n.d.). National Turkey Federation. Retrieved April 9, 2021, from https://www.eatturkey.org/raising-turkeys/

36. O'Neil, C. E., Keast, D. R., Fulgoni, V. L., & Nicklas, T. A. (2012). Food Sources of Energy and Nutrients among Adults in the US: NHANES 2003–2006. Nutrients, 4(12), 2097–2120. https://doi.org/10.3390/nu4122097

37. Animal Well-being. (n.d.). Pork Checkoff. Retrieved September 18, 2025, from https://porkcheckoff.org/pork-production-management/animal-wellbeing/

38. Pelletier, N., Ibarburu, M., & Xin, H. (2014). Comparison of the environmental footprint of the egg industry in the United States in 1960 and 2010. Poultry Science, 93(2), 241–255. https://doi.org/10.3382/ps.2013-03390

39. Salmonella Verification Testing Program Monthly Posting | Food Safety and Inspection Service. (n.d.). Retrieved September 8, 2025, from http://www.fsis.usda.gov/science-data/data-sets-visualizations/microbiology/salmonella-verification-testing-program-monthly

40. Rong, Y., Chen, L., Zhu, T., Song, Y., Yu, M., Shan, Z., Sands, A., Hu, F. B., & Liu, L. (2013). Egg consumption and risk of coronary heart disease and stroke: Dose-response meta-analysis of prospective cohort studies. BMJ, 346, e8539. https://doi.org/10.1136/bmj.e8539

41. Seafood Safety. (n.d.). About Seafood. Retrieved September 18, 2025, from https://aboutseafood.com/advocacy/seafood-safety/

42. Shumway, S. E., Davis, C., Downey, R., Karney, R., Kraeuter, J., Rheault, R., & Wikfors, G. (2003). Shellfish aquaculture — In praise of sustainable economies and environments, 4.

43. EnvironmentAl Impact. (n.d.). American Veal Association. Retrieved September 12, 2025, from https://www.americanveal.com/environment-impact

44. The Many Uses of a Cow - Beef By-Products | Cattle Empire. (n.d.). Retrieved January 2, 2019, from https://cattle-empire.net/blog/f/the-many-uses-of-a-cow---beef-by-products

45. The Sustainability Impacts of Slow-Growing Broiler Production in the US. (2016).

46. Carbon Footprint Comparison Between Grass- and Grain-finished Beef—Oklahoma State University. (2017, March 1). https://extension.okstate.edu/fact-sheets/carbon-footprint-comparison-between-grass-and-grain-finished-beef.html

47. Tucker, C. S., & Hargreaves, J. A. (Eds.). (2008). Environmental Best Management Practices for Aquaculture. Oxford, UK: Wiley-Blackwell. https://doi.org/10.1002/9780813818672

8. US EPA, O. (2015, December 29). Sources of Greenhouse Gas Emissions [Overviews and Factsheets]. Retrieved December 31, 2018, from https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions

49. US EPA, R. 03. (2015, December 10). Basic Information about Anaerobic Digestion [Overviews and Factsheets]. Retrieved August 4, 2025, from https://www.epa.gov/anaerobic-digestion/basic-information-about-anaerobic-digestion

50. USDA Food Composition Databases. (2018). Retrieved December 28, 2018, from https://fdc.nal.usda.gov/

51. Nutrition. (n.d.). Veal – Discover Delicious. Retrieved April 9, 2021, from https://www.veal.org/cooking/nutrition/

52. "Antibiotic Stewardship." National Dairy Farm, 2020, nationaldairyfarm.com/dairy-farm-standards/antibiotic-stewardship/.

53. Jalkiewicz, L., RDN, & LDN. (2021, May 13). 13 Essential Nutrients in Milk. American Dairy Association North East. https://www.americandairy.com/dairy-diary/13-essential-nutrients-in-milk/

54. Feed Ingredient Consumption Report—IFEEDER. (n.d.). Retrieved August 4, 2025, from https://ifeeder.org/feeddata/

55. Pelton, R., Tricarico, J., Bernal, F., de Ondarza, M. B., & Kurt, T. (2025). Spatially Resolved Greenhouse Gas Emissions of U.S. Milk Production in 2020. Environmental Science & Technology, 59(19), 9552–9564. https://doi.org/10.1021/acs.est.5c01166

56. From Farm to Market: Fueling Demand with Sustainable Pork—Pork Checkoff. (n.d.). Retrieved April 12, 2024, from https://porkcheckoff.org/news/from-farm-to-market-fueling-demand-with-sustainable-pork/

57. FAOSTAT. (n.d.). Retrieved March 25, 2021, from http://www.fao.org/faostat/en/#home

References

58. Herrero, M., Havlík, P., Valin, H., Notenbaert, A., Rufino, M. C., Thornton, P. K., Blümmel, M., Weiss, F., Grace, D., & Obersteiner, M. (2013). Biomass use, production, feed efficiencies, and greenhouse gas emissions from global livestock systems. Proceedings of the National Academy of Sciences, 110(52), 20888–20893. https://doi.org/10.1073/pnas.1308149110

59. Dairy cows and climate change | U.S. Dairy. (n.d.). Retrieved April 19, 2022, from https://www.usdairy.com/news-articles/dairy-cows-and-climate-change

60. How are Today's Chicken Bred? (2016, March 22). Chicken Check In. https://www.chickencheck.in/farm-to-table/traditional-chicken-breeding/

61. How much protein is in chicken? Why is protein so important in the diet? (2019, December 13). Chicken Check In. https://www.chickencheck.in/faq/protein/

62. A Retrospective Assessment of U.S. Pork Production: 1960 to 2015 | Resilient Food Initiative. (n.d.). Retrieved September 18, 2025, from https://resilientfood.uark.edu/project/porkretro/

63. Cook, J. (2020, July 8). First Full Wool LCA Reveals Importance of Use Phase. International Wool Textile Organisation. https://iwto.org/first-full-wool-lca/

64. Climate Change Data | Climate Watch. (n.d.). Retrieved April 14, 2021, from https://www.climatewatchdata.org/sectors/agriculture?emissionType=136&emissionsCountry=EUU&filter=

65. Beef Research—Ecosystem Services. (n.d.). Beef Research. Retrieved April 14, 2021, from https://www.beefresearch.org/resources/beef-sustainability/fact-sheets/ecosystem-services

66. USDA/NASS QuickStats Ad-hoc Query Tool. (n.d.). Retrieved April 20, 2021, from https://quickstats.nass.usda.gov/results/3AC161F7-F361-3A66-9B6C-2E1220FEBF52?pivot=short_desc

67. Sustainability: How does chicken production impact the environment? (2019, August 27). Chicken Check In. https://www.chickencheck.in/faq/sustainability/

68. Turkey, the Perfect Protein—The NTF Gobbler. (2020, February 21). National Turkey Federation. https://www.eatturkey.org/2020/02/21/turkey-the-perfect-protein/

69. CDC. (2017, June 8). Raw Milk. Centers for Disease Control and Prevention. https://www.cdc.gov/foodsafety/rawmilk/raw-milk-index.html

70. Association, N. C. G. (n.d.). Sustainability. National Corn Growers Association. Retrieved March 1, 2023, from https://www.ncga.com/key-issues/current-priorities/sustainability

71. Houser, R. (2022, March 30). Soy Checkoff Releases 2021 Sustainability Overview Report. United Soybean Board. https://www.unitedsoybean.org/hopper/soy-checkoff-releases-2021-sustainability-overview-report/

72. Hutchins, C. (2023). Feed Outlook: January 2023. https://ers.usda.gov/sites/default/files/_laserfiche/outlooks/105629/FDS-23a.pdf?v=18072

73. Anonymous. (2022, January 7). Dairy Cows—The Original Upcyclers. CLEAR Center. https://clear.ucdavis.edu/explainers/dairy-cows-original-upcyclers

74. Réhault-Godbert, S., Guyot, N., & Nys, Y. (2019). The Golden Egg: Nutritional Value, Bioactivities, and Emerging Benefits for Human Health. Nutrients, 11(3), 684. https://doi.org/10.3390/nu11030684

75. Capper, J. L. (2012). Is the Grass Always Greener? Comparing the Environmental Impact of Conventional, Natural and Grass-Fed Beef Production Systems. Animals: An Open Access Journal from MDPI, 2(2), 127–143. https://doi.org/10.3390/ani2020127

76. Pelletier, N., Pirog, R., & Rasmussen, R. (2010). Comparative life cycle environmental impacts of three beef production strategies in the Upper Midwestern United States. Agricultural Systems, 103(6), 380–389. https://doi.org/10.1016/j.agsy.2010.03.009

77. US EPA, O. (2024, February 8). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022 [Reports and Assessments]. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2022

78. Gestating sows' preference for open, closed and animal-controlled stall designs—Pork Checkoff. (n.d.). Retrieved April 12, 2024, from https://porkcheckoff.org/research/gestating-sows-preference-for-open-closed-and-animal-controlled-stall-designs/

79. Protein in Pork. (n.d.). Pork.Org. Retrieved August 5, 2025, from https://pork.org/nutrition/protein-in-pork/

80. Leidy, H. J., Clifton, P. M., Astrup, A., Wycherley, T. P., Westerterp-Plantenga, M. S., Luscombe-Marsh, N. D., Woods, S. C., & Mattes, R. D. (2015). The role of protein in weight loss and maintenance. The American Journal of Clinical Nutrition, 101(6), 1320S-1329S. https://doi.org/10.3945/ajcn.114.084038

81. American Diabetes Association. (2018). Lifestyle Management: Standards of Medical Care in Diabetes—2019. Diabetes Care, 42(Supplement_1), S46–S60. https://doi.org/10.2337/dc19-S005

82. Fisheries, N. (2025, September 5). Sustainable Seafood | NOAA Fisheries (National). NOAA. https://www.fisheries.noaa.gov/topic/sustainable-seafood