

Two of the world's biggest challenges are producing enough food for a rapidly growing population, and taking care of our planet. Some would argue that producing food and caring for our world are indirect competition with each other. However, today's farmers work hard to protect our air, water and soil. They understand the importance of protecting the environment for future generations, and they depend on the land for their businesses.

All dairy farmers must follow stringent regulations to protect the air, land and water on their farms, and they take great pride in exceeding those requirements. They are responsible users of water in their milking parlors, barns and dairy waste storage areas. They recycle both water and manure, and take measures to improve the quality of our water supplies. Some farms produce electricity from alternative energy sources on the farm, including the sun, wind and waste products.

The Dairy Farm's Role in the Environment

How do you think a dairy farm influence our environment?

Protecting our environment is critical to our future existence. We need clean water and air to sustain life. Our food, water and air supply are all dependent on a healthy environment. We all need to play a role in protecting our natural resources.

Dairy farms provide wide open spaces for local communities. They also play an important role in caring for the environment. The dairy farmer is one of many individuals who must take responsibility for using environmentally friendly

A healthy environment is essential to farmers because their livelihood depends on the quality of the land they farm and the water their cows drink.

To protect the land for future generations, farmers use environmentally safe farming practices such as no-till farming and rotational cropping. No-till farming is a way of growing crops from year to year without disturbing the ground through tillage to prevent top soil losses. Rotational cropping allows a farmer to rotate crops to continually replenish nutrients to the soil.

Cows eat about 90 pounds of food and drink about 40 gallons of water every day. In addition to producing milk from all that food, their bodies produce waste, known as cow manure. Each cow produces about 30 pounds of cow manure every day. This waste must be properly handled to protect the environment.

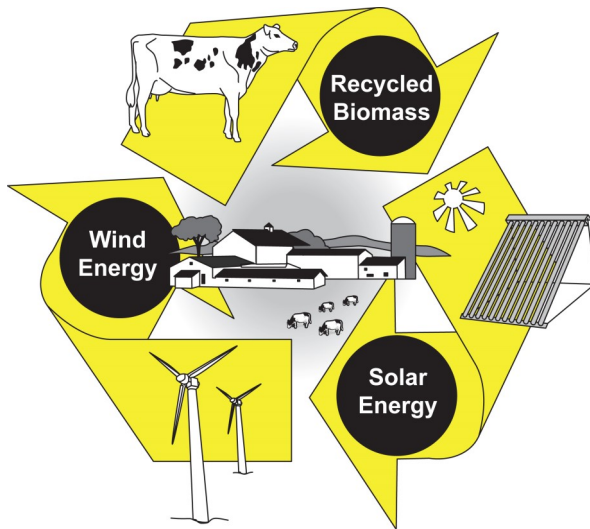


Manure is rich in soil-building nutrients. The farmer recycles this manure on nearby crop fields to replenish the nutrients in the soil. The manure is applied according to detailed nutrient management plans regulated by the federal, state and local government. This ensures the farmer abides by clean water laws and protects the water on and near his farm.

Organizations like the **Environmental Protection Agency** (EPA) have guidelines farmers must follow to protect the environment and handle their waste. Most farmers have a Nutrient Management Plan in place, which explains how they will meet or exceed those guidelines.



Dairy farms play a vital role in the local community because of the wide open spaces they provide. Farmers have an important responsibility to care for the environment by using environmentally-friendly practices daily on their dairy operations.



Energy Sources on the Farm

What sources of energy exist on the dairy farm?

About 18 percent of our global energy consumption comes from renewable energy sources. As concerns about the environment increase, more and more people are looking at renewable energy as the way of the future. A dairy farm can be a valuable source of this renewable energy, which helps to reduce pollution, global warming and U.S. dependence on imported fuels.

Renewable energy on the farm comes from wind, solar and biomass energy sources. They can be used on the farm to replace other fuels or sold to the local community as electricity. By capturing these sources of renewable energy, dairy farms can lower their own energy costs while becoming a source of renewable energy for their local community.

Biomass energy is produced from plants and organic waste, everything from crops, trees and crop residues to manure. On several dairy farms across the country, anaerobic digesters are used to convert the energy stored in the organic materials in cow manure into a useable source of energy.

The anaerobic digester converts the energy stored in manure to a biogas called methane, which can be combusted into energy to use to produce electricity for the farm or local community. The material remaining after methane is removed from the manure

can often be used as compost or fertilizer.

Manure is a nutrient-dense substance that, if not managed properly, has the potential to pollute streams and water supplies. More and more farmers are using the process of methane digestion to turn this cow waste into new renewable commodities – energy, compost and fertilizer.

Other dairy farmers have installed giant wind turbines on their farms to collect energy from the wind. Farms have long used wind power to pump water and generate electricity through windmills. Giant wind turbines convert the kinetic energy in the wind into mechanical power. That energy is then used for tasks (such as grinding grain) or made into energy by a generator.

Another source of renewable energy on the farm is the sunlight, which holds an enormous amount of energy. All of the energy stored in Earth's reserves of coal, oil and natural gas is equal to the energy from only 20 days of sunlight.

Solar Energy is Utilized By:

- ◆ **Solar heat collectors** dry crops & warm buildings.
- ◆ **Solar water heaters** provide hot water for the farm.
- ◆ **Solar electric panels** turn sunlight into electricity to power the farm or sell to the community.

Lesson Vocabulary:

Cow manure — a nutrient-dense substance produced as a waste product from the cow.

No-Till Farming — Growing crops without disturbing the soil through the use of tillage (breaking ground) practices.

Rotational Cropping — Rotating the crops planted year after year to replenish nutrients in the soil.

Environmental Protection Agency (EPA) — A federal agency with the mission to protect human health and to safeguard the natural environment -- air, water and land -- upon which life depends.

Renewable Energy — Energy that comes from natural resources, such as sunlight, wind, rain or biomass, that can be naturally replenished.

Biomass Energy — Energy produced from plants and organic waste, everything from crop residues to manure.

Anaerobic Digester — A machine that limits oxygen to compost or digest organic waste to produce methane.

Methane — a biogas that can produce energy.

Kinetic energy — Energy from an object in motion.

Mechanical energy — Energy used to do work.

