

*News Article*

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## Understanding agriculture: dairy

If you are one who is perplexed by simple questions about agriculture that you don't understand, read on. Today's article is a primer on dairy, written primarily for the curious non-farmer.

In my years as an Extension Educator, I have run across folks that have little concept about where their dairy products, all found neatly arranged in the grocery store, come from. Some have said that milk simply comes from the grocery store, or some factory that manufactures it and delivers it to the grocery store. Some have said that chocolate milk comes from brown cows. Perhaps you are in this camp of thinking.

Let's start with what dairy products are. Dairy products include milk, cheese, butter, yogurt, ice cream, cottage cheese, and similar products. Indiana ranks 2<sup>nd</sup> in ice cream production among all states.

Dairy products all start from the raw product of milk, and milk comes from the udders (the bag-like mammary gland near the rear legs) of dairy cows. We are not talking about goats today, but many similar products can be made from goat milk. Dairy cows are "built" primarily to give milk, as opposed to beef cattle, which are primarily grown for meat. Dairy cows can produce 128 glasses of milk per day.

There are several breeds of dairy cows, each with their own unique characteristics. Holstein is the most common – they have a patchy black and white colored hide. Other common breeds include Guernsey, Ayrshire, Jersey, Brown Swiss, and Milking Shorthorn.

A baby dairy animal is called a calf, weighing 80-100 pounds when it's born. A young female calf is called a heifer, and a young male calf is called a bull. An adult female who has had a calf is called a cow, and an adult male still able to breed is called a bull. Castrated males are called steers. Birthing is called calving.

A healthy heifer is bred when she is 13-15 months of age, with the goal of calving when she is about 2 years old.

Dairy cows begin to produce milk after they have given birth to a baby calf. Lactation (milk production) begins, and continues for about 10 months. About 40-50 days after calving they are re-bred. Cows are allowed to go dry for 45 to 60 days prior to calving time. The gestation (pregnancy) period is approximately 283 days for a dairy cow, and can range from 280-285 days (about 9½ months).

The udder of a cow holds the milk, and it has four teats. These are the "spigots" that are gently squeezed to obtain milk, similar to the action that a young suckling calf would perform to obtain milk. There are roughly 350 dairy cow udder "squirts" in a gallon of milk.

Milk is collected and cooled in a bulk tank on the farm, then the milk truck from the dairy processing plant comes to collect it. Prior to collection, all milk is tested for antibiotic residues, milk fat, milk protein, bacteria and somatic cell (white blood cell) counts. At the milk processing plant, milk is clarified (solid particles removed by filtration and centrifugation), pasteurized (heated to kill disease-causing organisms), cooled and separated into cream and skim milk. The plant then standardizes milk to a consistent milk-fat percentage, homogenizes (fat particles broken into smaller pieces so they stay mixed in the milk), fortifies with vitamin A or D (or both), and packaged for sale. Some milk is used to make other products, like ice cream, cheese and yogurt.

Farmers are paid based on pounds of milk, the quality of the milk, and amount of milk-fat present.

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Milk is highly regulated by the Federal Food and Drug Administration (FDA) to assure that food safety standards are met. For example, no retail milk may contain antibiotic residues.

Milk is a very nutritious food. It is a good source of protein, and it is the best natural source of calcium and vitamin D. It is also high in B vitamins.

Strict attention is paid to the diets of dairy cows, dry cows, and heifers. Professional nutritionists help dairy farmers develop these rations, much like a dietician may help us with our diet. They need various amounts of carbohydrates, fats, minerals, proteins, and vitamins, which they get from a number of foodstuffs, including grains, forages and other nutritional supplements. Grains may include corn, wheat, oats or others. Forages are plants (alfalfa, clover, grasses or corn) that are harvested, and either baled dry or ensiled. Ensiled forages ferment and retain a high nutritional content. Silos can be horizontal bunkers utilizing large silo bags, or upright constructed tube-like structures that are noticeable in the rural landscape. Cows need large amounts of forages because of the nature of their ruminant (4-chambered) stomach, different than people, pigs, and horses. A continual supply of clean, fresh water is always available. Cows can consume up to 30 gallons of water per day during peak lactation, analogous to a bathtub full of water.

Dairy farmers work closely with veterinarians to ensure their cows remain healthy. If antibiotics are needed to help a sick cow get well again, her milk is discarded and not allowed to enter the milk supply.

According to USDA National Agricultural Statistics Service, Indiana Field Office, in 2017, Whitley County ranked 31<sup>st</sup> among Indiana counties in number of milk cows.

Purdue Extension offers research-based education to youth through its 4-H program. Much of the material I have shared today is sourced from the Dairy Resource Handbook, 4-H 127R, published by The Ohio State University, one of our sister land-grant institutions. Some information is sourced from the Glass Barn Education Center (Indiana State Fair) <https://www.glassbarn.org/>.

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