

Junior 4-H Dairy Production

for Mississippi 4-H club members



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WELCOME TO THE 4-H DAIRY PROJECT

As a Mississippi 4-H Club member enrolled in the dairy project, you will learn many things about your calf, yourself, and the dairy industry. Working with dairy animals teaches you to plan and look ahead. You must plan in advance for shelter, feed, water, and management.

Since the dairy project requires more planning and work than many other 4-H projects, it may seem like all work and no play. The thrill of watching a heifer grow and develop, showing her, caring for her, and having her come into production is most rewarding. The 4-H dairy project lets you meet dairy cattle breeders and other young people interested in the dairy industry. You will find, as you learn by doing, that you want to tell and show other 4-H'ers what you have learned. 4-H Club work in dairy trains you in selecting, breeding, feeding, fitting, and showing dairy animals. Most important, you gain knowledge and develop your ability to display leadership. If you enjoy working with animals, you will find your years spent in this project fascinating, rewarding, and adventurous.

Growing up with a dairy calf is a fascinating adventure. You will find many joys and worthwhile experiences that will always remain with you. Along with your many pleasures, you will probably have a few disappointments and setbacks. As you experience a failure, strive hard to overcome it and to do better next time. This will lift you to greater heights and keep you looking ahead. You will want to do all you can to develop a large, healthy heifer. You will want your heifer to grow into a strong, outstanding cow that can produce lots of milk.

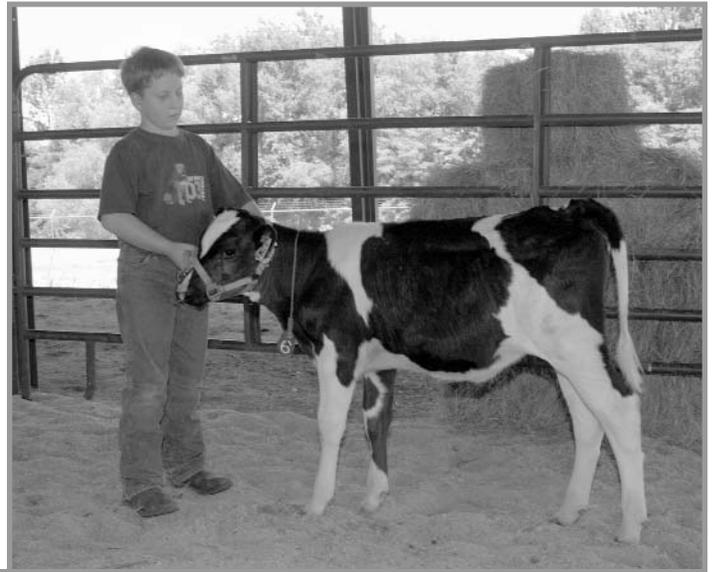
THE DAIRY INDUSTRY

Christopher Columbus brought the first cows to the Americas in 1493. These cows provided milk and meat for the settlers of the West Indies. In 1611, cows arrived at the Jamestown colony, and among the first laws written for this Virginia colony were several protecting cows. The dairy industry in the United States has made steady progress since the first 100 cows arrived in Jamestown. As families moved westward, cows were tied behind the wagons and provided settlers with milk and butter along the way. Today, cows are found in all 50 states, including Alaska and Hawaii. In 2001, there were more than 76,000 dairy farms in the U. S. In the same year, there were over 9,000,000 cows in the U.S. Today the dairy industry has grown and adopted many new technologies. Some dairies even have robotic milkers. Cows have become more efficient compared with their ancestors because of the work of geneticists, nutritionists, agronomists, agricultural engineers, bacteriologists, physiologists, biochemists, veterinarians, and other scientists.

BREEDS OF DAIRY CATTLE

Holstein

These large black and white dairy cattle originated in the northern part of the Netherlands in the provinces of West Friesland and North Holland. The breed's complete name is "Holstein-Friesian." Holstein is the common name in the U.S. and Canada, but they are called Friesian in many other countries. They are noted for high milk production. In recent years, this breed has increased more in numbers than any other dairy breed in this country. Records show this breed was brought to the U.S. in 1857.



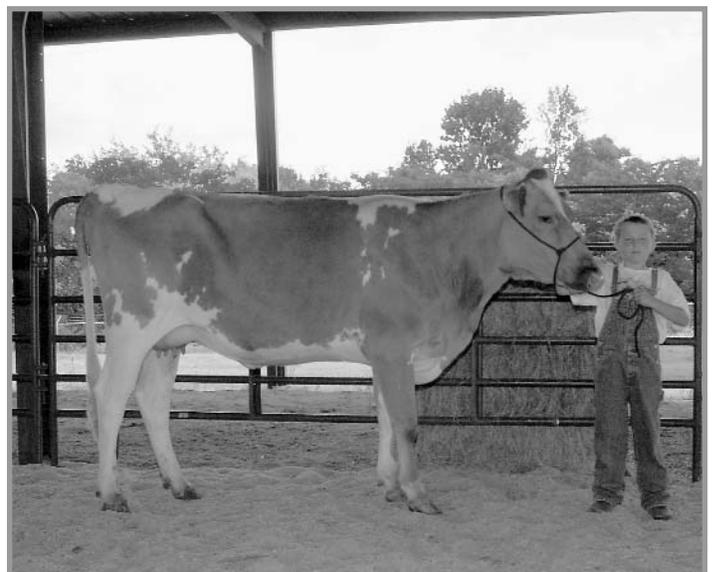
Jersey

This smaller breed comes from the Isle of Jersey in the English Channel. It is noted for the high butterfat content of its milk. The first Jerseys arrived in this country in the early 1800s, and since then the Jersey has been one of the popular dairy breeds in the U.S. Jerseys range in color from fawn (light yellow-grey-brown) to very dark brown, almost black, and they may have white markings.



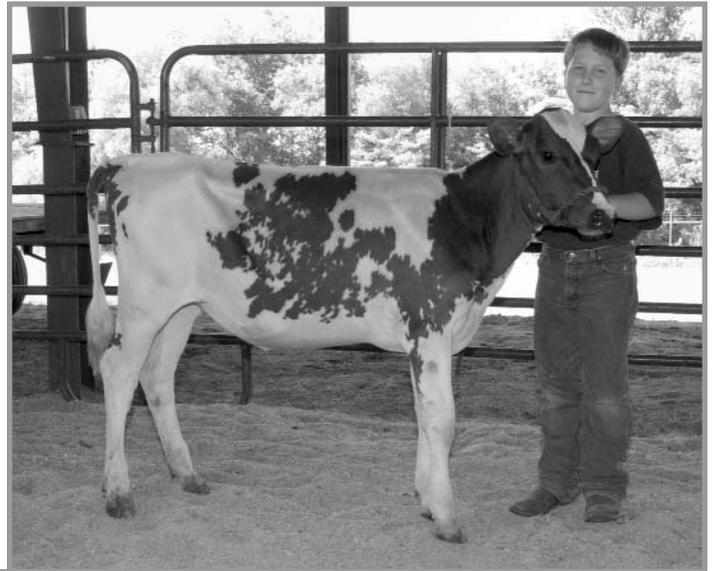
Guernsey

Guernseys were developed on the English Channel islands of Guernsey, Alderney, and Sark. This breed is thought to be a cross between two French breeds in the late 1600s. Two heifers and a bull were imported to America in 1830 or 1831. They are lighter colored than the other dairy breeds, with clearly defined golden fawn and white markings. The skin, especially on the nose, in the ears, and around the eyes and udder, should be a golden yellow. A clear or buff muzzle is preferred.



Ayrshire

This is a Scottish breed from County Ayr. It is known for straight lines, balanced udders, upward curving horns, and red and white color variations and combinations. Ayrshires have been known as a dairy breed since 1814. The first Ayrshires were brought into the U.S. in 1822 and are now found in nearly every state.



Brown Swiss

This is probably the oldest of the existing dairy breeds. It originated in Switzerland, where it was originally bred for milk, meat, and work. Its color is a solid grey-brown, varying from light to dark. Brown Swiss cattle were brought to the U.S. in 1869, and you now find them in nearly all of the states. The first Brown Swiss bull registered in the United States was named William Tell.



Body Size and Average Annual Milk Production of the Major U.S. Dairy Breeds

Breed	Weight of Mature Cow	Milk	Milk Fat	
	<i>lbs</i>		<i>lbs</i>	<i>percent</i>
Ayrshire	1,200	17,878	3.84	687
Brown Swiss	1,500	20,694	4.00	827
Guernsey	1,100	16,410	4.44	728
Holstein	1,500	24,889	3.63	904
Jersey	1,000	17,472	4.59	802

U.S.D.A AIPL Breed Averages (2001)

Breed Associations

The Holstein-Friesian Association of America
1 Holstein Place
Brattleboro, VT 05302-0808

American Jersey Cattle Club
6486 E. Main Street
Reynoldsburg, OH 43608-2362

American Guernsey Association
7614 Slate Ridge Boulevard
Reynoldsburg, OH 43608-0666

Ayrshire Breeders' Association
1224 Alton Darby Creek Rd., Suite B
Columbus, OH 43228

Brown Swiss Cattle Breeders' Association
800 Pleasant Street
Beloit, WI 53511-5456

American Milking Shorthorn Society
800 Pleasant Street
Beloit, WI 53511-5456

Red and White Dairy Cattle Association
3805 S Valley Rd
Crystal Spring, PA 15536

Mississippi Associations

Mississippi Holstein-Friesian Association, Inc.
Mississippi Jersey Cattle Club

SELECTING AND MANAGING YOUR HEIFER

Selecting Your First Calf. You must consider many things in selecting your first calf. You should consider getting advice from a knowledgeable person such as a breeder, parent, neighbor, or brother or sister. The first question you must answer is, "What breed will I select?"

There are good animals in all breeds, and once you've decided what type you want, the next question is, "What age animal should I select?" It is generally best for a young club member to start out with a young calf, one about 3 months old. Calves of this age are usually easier to raise and have already gone through the most expensive feeding period. The important thing is to start with a calf of good functional type (good feet and legs and outstanding breed character with a deep, open rib) and conformation. The Dairy Cattle Judging Manual (Mississippi State University Extension Service publication 194) will help you learn the parts of the cow and how to judge cows. Neighboring breeders or your family are good places to start when looking for your project calf.

Of course, cost is important, but try to get the very best calf you can afford. A good one is cheaper in the long run. The calf's date of birth is important. The base dates for showing are March 1, June 1, September 1, and December 1. An animal born in March, June, September, or December usually has an advantage over later born animals.

Junior shows require that your animal be registered in your name. The transfer of ownership must be recorded in the breed association office.

When buying a dairy heifer, base your choice mainly on the same things a breeder uses to build his herd. A good dairy producer keeps calves from the high-production and good type cows. To do this, the pedigree of an animal is evaluated before buying.

Ask your Extension agent to help you find the right kind of animal. Careful selection of your calf is only a start, because a good pedigree alone does not guarantee high production or show ring winnings. Unless your calf grows and develops properly from birth to maturity, you will lose many of the benefits from good breeding and selection.

COMMERCIAL DAIRY HEIFER PROJECT

In addition to showing registered dairy cows, you can participate in Mississippi's commercial dairy heifer project, which includes dairy shows across the state. Many of the county and state fall dairy shows are including commercial dairy heifer classes in their programs. Here are the rules for the commercial heifer shows:

1. Non-registered dairy heifers who are the offspring of purebred or mixed dairy cattle.
2. Heifers must weigh between 200 and 750 pounds at the time of weigh-in at each show.
3. Heifers must be owned and cared for by 4-H or FFA youth on or before August 1 for the Mississippi State Fair and December 1 for the Dixie National Junior Roundup.
4. Heifers are divided into classes by weight.

When buying a commercial or unregistered calf, look for one with good type and conformation.

CARING FOR YOUR CALF

Now that you have bought the right type of calf, it is important to care for her properly so she will develop and grow normally. To raise a healthy calf, you should provide suitable shelter, feed the calf correctly, and follow good management practices for disease prevention.

Identify Your Calf. It is important to identify your calf, especially if you keep her in a group. If you have a purebred calf, breed associations require a permanent form of identification to register the calf. Permanent identification can be done using photos or color sketches of each side of the animal (Ayrshire,

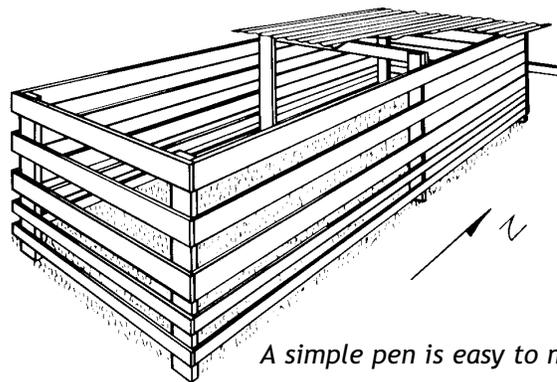


An ear tag is one way to identify your calf.

Guernsey, and Holstein), ear tattoos (Brown Swiss, Jerseys, and Milking Shorthorn), or freeze branding. For temporary identification, you can use neck straps/chains (leather, plastic or chain) or eartags. Identification is also important when making feeding, health, or breeding decisions. Record the calf's name, date of birth, sire name and number, and dam name and number along with this identification.

Tattoo. The ear tattoo is one of the best and most popular ways to identify calves. The tattoo is a permanent mark in the ear that positively identifies the calf. The solid-color breeds, such as Jersey and Brown Swiss, especially prefer this method. Guernseys and Ayrshires also accept ear tattoos as positive identification. For the broken-color breeds, such as Holstein or Ayrshire, you may sketch or photograph. It is a good practice to tattoo all calves, since this is a permanent identification and can't be lost. Be sure, however that you have positive identification, such as eartag or neck strap, until this is done.

Housing the Calf. Young calves, which haven't been weaned, do best when raised separately in individual pens. The pens keep calves from suckling each other and spreading disease. Keep the calf's environment dry, with good air flow, and well supplied with good bedding. You can care for and feed your calf better in this type pen. You can easily make a simple 4 ft x 8 ft pen. Ask your agent for a copy of construction sheet 723-33.

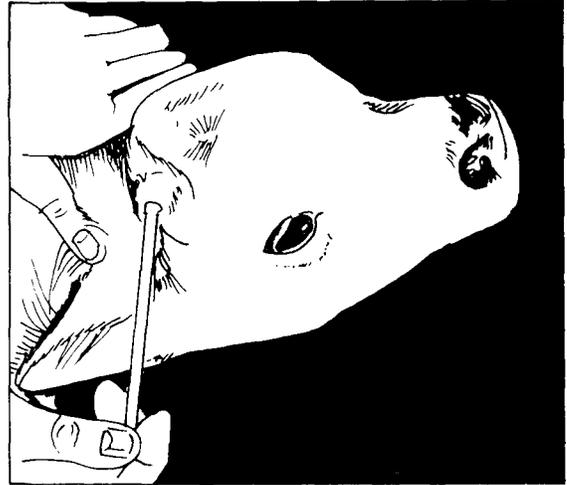


A simple pen is easy to make.

Teaching the Calf To Lead. You should exhibit your calf at the winter and fall dairy shows. Before you do, you will need to teach her to lead. Once you teach your calf to lead, she never forgets. She will be easier to handle as she becomes older. First, get a good strong halter. Practice leading your calf daily. Do not whip your calf. Patience and kindness pay off. Short periods of leading are better than long ones. For more information about getting your calf ready for a show, read *Preparing To Show Your Dairy Animal*, Mississippi State University Extension Service publication 1759 from your county Extension office.



Teaching your animal to lead and pose properly is important before show day.



Put petroleum jelly around the edges of the dehorned area.

Dehorning. When cows were wild, they needed horns for protection. Today, dairy animals do not need horns. Horns are a nuisance and can cause body and udder injuries. For best results calves should be dehorned at about two weeks of age. Actually, you do not dehorn but rather prevent growth of the horn by killing the horn bud. This method is humane, heals rapidly, and causes little discomfort to the animal. There are several methods for horn removal. The method you choose will depend on your resources and preference. Caustic potash works well in stick, paste, or liquid forms when calves are young (older than 3 weeks). Use the material carefully, follow the manufacturer's directions, and avoid contact with your skin or other calves.

Electric or gas dehorning can also be used effectively. You can use this method on calves younger than 4 months. Here are some points to remember about dehorning calves:

1. Clip hair around horn bud.
2. Scrape with sterile knife until horn bud is red and about ready to bleed.
3. Apply stick or caustic potash or dehorning compound until entire surface is covered. Do not apply too much.
4. Apply petroleum jelly around edges to keep the solution from running.
5. Keep treated calves under shelter for 3 days.

Extra Teats. Extra teats are not only unattractive but may interfere with milking. You can remove a calf's extra teats as soon as you can determine which are the extra ones. After cleaning and disinfecting the area with iodine, snip off extra teats with sharp scissors. If you aren't certain which are extra, wait. Ask a trained person to help you with this job.

Parasite and Insect Control. Parasite and insect control are an important part of keeping your calf healthy. Flies, lice, and internal worms can cause or spread diseases that can make your calf sick. Try to keep your calf's pen clean to reduce the areas where flies can breed. There are different methods of insect control you can use on your heifer and her environment to help control insects, but be sure to follow the directions carefully. Deworm your calf on a regular schedule to control internal parasites and to help your heifer keep growing at a normal rate. Talk to your veterinarian or someone knowledgeable to help you set up a good deworming schedule.



Daily brushing makes the coat shiny and glossy



Check the growth of your calf now and then with a tape measure.

Growing Your Calf. You will want to check your calf's growth. Her weight should be checked often. An easy way to find out how much your calf weighs is to measure her with a weight tape, which is available through a livestock supplies dealer. To measure your calf, place her in a normal standing position. Draw the tape snugly around the heart girth, just behind the front legs and shoulders.

You should also measure your calf's height at her withers. To locate your calf's withers, draw a line from just behind her front legs up to her back (review the parts of the cow located in the Dairy Cattle Judging booklet).

By measuring her weight and height, you will determine if your calf is the right size and weight for her age. Use the table below to see how your calf is growing. Be sure each time to find the right breed column for your calf before comparing your measurement. The table below helps you compare the weight and size of your calf with other calves of the same age. Remember, these figures are averages for the different breeds. If your calf is very much below the average for your breed, contact your 4-H leader or Extension agent to find out why. You may need to change your feeding practices. Just as your calf gets older each day, she must grow each day to be the desired size at breeding age. To prove this, let's work a little problem.

Assume you have a Jersey calf that weighs 56 pounds at birth. According to the growth chart, she should weigh at least 565 pounds at 15 months or breeding age. If we subtract 56 pounds from 565 pounds, we get 509 pounds, the amount she should grow or gain between 1 day and 15 months. The 15 months times 30 days per month equals 450 days to grow between 1 day and 15 months. If the calf has 450 days to grow and needs to gain 509 pounds, then she must average growing 1.1 pounds a day from birth to breeding age.

Feeding Your Young Calf. Your young calf needs help to become a good cow. The kind of help she needs is plenty of good feed and care. A newborn calf needs its mother's milk immediately after it is born. This milk, called "colostrum," is highly nutritious and protects the calf against infections because of the high level of protective antibodies in it.

Calf Growth Chart by Breed

Age Months	Holstein		Brown Swiss		Guernsey		Ayrshire		Jersey	
	Weight Range (lbs)	Wither Height Range (in)								
3	211-284	35-38	240-283	36-38	203-233	35-37	223-256	34-36	155-177	32-34
6	369-480	40-44	396-462	40-44	366-434	40-42	360-407	39-41	259-321	36-39
12	682-843	47-51	693-805	47-51	576-674	46-48	624-697	45-47	471-548	42-44
15	843-1067	49-53	829-963	49-53	740-866	48-50	748-834	47-49	565-640	44-46
24	1170-1545	53-57	1167-1343	53-57	1026-1178	52-55	1070-1206	50-52	790-893	48-50

*Monitoring Dairy Heifer Growth. Jud Heinrichs and Brian Lammers, The Pennsylvania State University, 1998.



Teaching your calf to drink milk from a pail can be a fun learning experience.

A newborn calf needs 1 to 2 quarts of colostrum immediately after she's born. After your calf has been fed the colostrum for 3 days, you can switch to milk from the herd or commercial milk replacer. Teach your calf to drink from a nipple pail or open pail. It is easy to teach the calf to suckle a nipple.

For the open pail, follow these steps:

1. Separate the calf from its mother for about 12 hours, so it will be hungry.
2. Back the calf into a corner, then straddle its shoulders.
3. Dip two fingers into the warm milk, and while the calf is suckling your fingers, draw its head down slowly to the milk.
4. When the calf starts drawing milk into its mouth, remove your fingers.

Comparison of the Composition of Milk and Colostrum

	Whole Milk	Colostrum
Water	87.0	72.0
Minerals	0.7	1.0
Fat	4.0	6.0
Protein	3.3	17.0
Sugar (Lactose)	5.0	3.0
Total Solids	12.5	23.9

How To Feed

1. Feed the calf immediately after milking, or warm the milk to body temperature (about 100 °F) before feeding. Cold milk causes digestive upsets.
2. Weigh or measure the amount of milk at each feeding. A good rule is 1 pound (pint) of milk for each 10 pounds bodyweight of calf divided into two feedings daily.
3. Use clean pails for feeding. You must wash the pails after each feeding.
4. Feed at the same time each day.
5. Avoid changes in amounts or temperature of milk. Change from colostrum to herd milk gradually.
6. Avoid overfeeding. If calf becomes sick, reduce the amount of milk fed.
7. When the calf is on milk or milk replacer, begin offering calf starter.
8. When the calf starts eating 1 or more pounds of calf starter a day, slowly switch the calf from milk or milk replacer to water by gradually reducing the amount of milk.
9. Keep fresh calf starter and fresh water available to your calf. Don't let the feed get old and stale. Feed fresh calf starter daily.



Use clean pails for feeding your calf. Wash the pail every daily.

Calf diarrhea, also known as scours, is common in young calves. There are several causes of scours, but by detecting scours early, you can begin treatment. Your veterinarian can help you identify which organisms are causing the scours and which treatment (antibiotics) to use. It is always a good idea to discuss the treatment with your veterinarian.

In addition to treating the cause of scours, you must treat the two other problems resulting from scours: dehydration (loss of body fluids) and acidosis (increased acidity). Dehydration is the most important problem that must be treated as soon as possible by replacing lost water and electrolytes (minerals).

At the first sign of scours, begin feeding electrolytes. Research has shown that taking away milk is not helpful. Feed your calf milk and electrolytes separately. By feeding the electrolyte solution separately, you will be giving your calf extra fluid, which is very important when it is losing water.

Because fast action is important when treating scours, here is a recipe for a homemade solution you can use if you don't have a commercial product. However, a commercial product mixed with water is as cost-effective as a homemade product and will have the minerals and other ingredients your calf needs.

- 1 can beef consommé
- 1 pkg. Sure Jel (jelly-making pectin)
- 2 tsp. low sodium (Lite) salt
- 2 tsp. baking soda
- Warm water to make 2 quarts

Do not use table sugar, because it will make the scours worse.

Feeding Guide

Age (Weeks)	Type of Feed	Amount To Feed Each Day		
		Holstein BrownSwiss	Ayrshire Guernsey	Jersey
First 3 days	Colostrum	2 -3 quarts	2 -3 quarts	2 -3 quarts
1st Week	Colostrum or limited whole milk	8 % of calf's body weight	8 % of calf's body weight	8 % of calf's body weight
2nd Week	Colostrum or limited whole milk	9 lbs	7 lbs	7 lbs
	Calf Starter	Free choice (fresh daily)	Free choice (fresh daily)	Free choice (fresh daily)
3rd Week	Colostrum or limited whole milk	10 lbs	8 lbs	8 lbs
	Calf Starter	Free choice (fresh daily)	Free choice (fresh daily)	Free choice (fresh daily)
4th Week	Colostrum or limited whole milk	10 lbs	8 lbs	8 lbs
	Calf Starter	Free choice (fresh daily)	Free choice (fresh daily)	Free choice (fresh daily)
	Hay	Small amounts (fresh daily)	Small amounts (fresh daily)	Small amounts (fresh daily)
5th Week	Colostrum or limited whole milk	10 lbs	8 lbs	8 lbs
	Calf Starter	Free choice (fresh daily)	Free choice (fresh daily)	Free choice (fresh daily)
	Hay	Small amounts (fresh daily)	Small amounts (fresh daily)	Small amounts (fresh daily)
6th Week	Colostrum or limited whole milk	Discontinue milk when calf is eating 2 lbs of calf starter daily	Discontinue milk when calf is eating 2 lbs of calf starter daily	Discontinue milk when calf is eating 2 lbs of calf starter daily
	Calf Starter	Free choice	Free choice	Free choice
	Hay	Free choice	Free choice	Free choice

What about feeding hay to your young calf?

Nutritionists have learned that feeding hay to very young calves is not an effective way of developing the rumen. Although you can feed a small amount of hay, try to avoid feeding hay free choice until after your heifer is weaned. When your heifer has been weaned and is ready to start eating hay, pick the best hay on your farm for your calf. If you don't have any good hay, buy a few bales for your calf. Look for green hay with fine stems and many leaves. It is more important to have good hay than to worry about the kind.

Don't feed corn silage. Corn silage has a lot of water that can limit intake and growth of your calf. Feed fresh hay each day; remove the leftover hay before adding a new supply. Keep plenty of clean, fresh water before your calf at all times. Clean the water pail daily. Provide trace-mineralized salt for your calf at all times. Keep the salt box out of the weather.

No single feeding method will fit all farm conditions. Your parents, local leader, and agent will help you select the best method for you. If you buy a calf that someone else has started on feed, be sure to find out how much and what kind of feed it has been getting. Try to use the same kind of feed for awhile. If you have to change, do it gradually. To guide you in how much milk to feed your calf, know the average weights of calves by breeds.

Good commercial calf starters are available, and you can buy them already containing antibiotics, coccidiostats, or other additives that can improve the health and performance of your calf. Depending on how many calves you are going to raise, purchasing a calf starter may be more economical. Look for a calf starter with a protein source with a balanced amino acid profile, such as soybean meal.

A Good Calf Starter (contains 16% - 20% crude protein)

Ingredients	Ration 1	Ration 2
Coarsely ground corn	50 lbs	50 lbs
Crushed or rolled oats	35 lbs	26 lbs
Soybean Meal	13 lbs	17 lbs
Molasses	-	5 lbs
Dicalcium phosphate	1 lb	1 lb
Trace-mineralized salt	1 lb	1 lb

Also add:	Vitamin A	3,000 IU per lb starter
	Vitamin D	1,500 IU per lb starter
	Antibiotic	20 milligrams of Terramycin or aureoycin per lb starter
	Coccidiostat	Bovatec®, Deccox®, or Rumensin® (follow recommended directions for feeding).

MANAGING YOUR HEIFER

Feeding the Growing Heifer. After your heifer is 10 to 12 months old, she grows normally on an adequate amount of high quality forage plus small amounts of grain. When pastures are low in quality or hay is poor, you will need a little more grain.

You should try to keep your heifer growing normally, but she should not become fat from overfeeding. The reason for this is the dairy cow must maintain her own body and produce milk from most of the remaining feed she eats. Fattening the dairy heifer is a poor practice. You should make sure your heifer has trace-mineralized salt and plenty of clean water available at all times. You can tape your heifer and check her growth (refer to the table on calf growth on page 00). Here is a satisfactory ration for growing heifers: Vary the amount of grain ration with her condition and needs. If the pasture and hay are good, cut down on grain. If the pasture and hay are poor, increase her grain.

Sample Rations for Growing Heifers

Ingredients	Ration 1	Ration 2
Coarsely ground corn	500 lbs	375 lbs
Crushed or rolled oats	270 lbs	330 lbs
Soybean Meal	210 lbs	200 lbs
Molasses	-	75 lbs
Dicalcium phosphate	10 lb	10 lb
Trace-mineralized salt	10 lb	10 lb

Breeding Your Heifer. If your heifer has made normal growth progress, she should be ready to breed between 15 to 16 months old. You should keep in mind both age and size in breeding your animal. By taping your heifer about every 3 months, you will know when she is of the proper size in relation to her age. Since the bull and cow each contribute 50 percent to the calf, you must consider carefully the bull you select.

As you show your heifer, try to keep in mind her weak points. It might help to ask dairy authorities to tell you where your animal needs the greatest improvement. The ideal situation would be to correct the animal's weaknesses by breeding to a bull strong in these points. These corrections and changes make breeding fascinating. There is always some surprise.

When To Breed Your Heifer

Breed	Weight (lbs)	Wither Height (inches)	Hip Height (inches)
Jersey	525-575	43-45	45-47
Guernsey	700-750	46-49	48-51
Ayrshire	700-750	46-48	48-50
Brown Swiss	750-800	48-51	50-53
Holstein	750-800	48-50	50-52

Generally speaking, use semen from the best service sire you can afford. Choosing a sire with higher predicted differences and higher ranking among the breed than your animal's sire offers you the best chance for genetic improvement. By being selective in your breeding program you will increase the value of your heifer and her offspring. Be sure to seek the advice of someone who knows before you breed your animal. Keep in mind the breeding date determines the calving date. The average gestation period for dairy cattle is about 280 days, but a normal range is from 275 to 285 days.

The following gestation periods are helpful.

Breeding Date	Calving Date*
June	March
September	June
December	September
March	December

* Remember that the best birth dates for show calves are March, June, September, or December.

Caring for the Bred Heifer. You should watch your heifer closely for 17 to 25 days after breeding to make sure she is bred. If she does not come back into heat, she may be pregnant. A vet should pregnancy check your animal two to three months after breeding if you believe she's pregnant. Otherwise, one or more heat periods can pass before she is bred. During the first 3 to 5 months after your heifer is bred, care for her in the same way as before she was bred.

After the fifth month of pregnancy, gradually condition the heifer for freshening. By calving time she should be in ideal condition, with some excess flesh. She should be fed all the good, high quality forage she will eat. The forage can come from good grazing, excellent hay, and silage. She also needs a supplemental

grain ration. The amount of grain fed depends on the amount and kind of forage available. The amounts usually range from 2 pounds daily with excellent forage to 6 pounds daily with poor forage. Needless to say, the condition of the heifer also influences the amount of grain needed. Watch the condition of your heifer closely about 3 months before calving. It may be necessary to feed more grain at this time to get her in proper condition for calving. Keep free-choice mineralized salt available constantly. She is now developing the fetus (calf) and needs minerals more than ever. Be careful not to overfeed your heifer because this could lead to her developing a big calf and having calving problems. Your heifer is about to make the most drastic change of her life, going from a heifer to a producing cow. You can help her make this change gradually by giving her gentle care and treatment. Take the heifer into the milking barn at milking time for 4 weeks before calving. This permits handling her udder and teats so that this will not come suddenly at calving.

MANAGING THE LACTATING COW

Care of the Calf. Calving time is one of the most exciting times during the year. The dairy club member always looks forward to the arrival of the first new calf.

It is best for someone to be present at calving time to give the cow any assistance she needs. Jerseys, Guernseys, Ayrshires, and Holsteins calve about 280 days (9 months + 10 days) after breeding; Brown Swiss calve about 290 days after breeding (9 months + 20 days). Be sure to know exactly when your heifer will calve. Watch your heifer closely each day for signs, beginning about 2 weeks before she is due to calve. The single most notable sign of calving is the filling of the udder. She should have access to a clean, dry pasture or pen or a well-bedded maternity stall during this time.

Be sure your calf starts to breathe normally after it is born. Allow the cow to lick the calf dry, or dry the calf with a burlap sack to prevent pneumonia. The calf should be fed colostrum, or first milk, shortly after it is born (see the "Feeding Your Young Calf" section on page). Colostrum contains antibodies to help protect the calf from disease and is very high in nutrients. The calf at birth has none of these antibodies in its digestive tract; therefore, it is totally unprotected against diseases from bacteria. The composition of milk varies according to the breed (see the Comparison of the Composition of Milk and Colostrum section on page). Shortly after birth be sure you have washed and disinfected the calf's navel with tincture of iodine.

Nutrition of the Cow. After your cow has calved, provide her with water and a fresh supply of good hay. From calving until peak milk production is a critical period for your cow. Since your cow produces about one-half

of her total yearly milk yield in the first 4 months of lactation, it is important to feed her properly during the early part of her lactation.

Your goal after calving is to increase your cow's feed intake as rapidly as possible to minimize the nutritional deficiency. During early lactation your cow can't eat enough to meet all of her nutritional needs. Two weeks before calving your cow should be eating about 1 percent of her body weight as grain. Increase her grain intake 1 to 1.5 pounds per day until she reaches her peak grain intake of no more than 2.5 percent of her body weight. It will take about two weeks for your cow to be on full grain feed. Although grain is important to meet her energy needs, her grain mix should contain supplemental protein at a level of 16 to 20 percent, depending on her milk production.

Ask someone knowledgeable to help guide you in feeding grain. To keep your cow's rumen and digestive system healthy, you must feed your cow at least 1 percent of her body weight as hay daily. Your cow will also need plenty of clean water. As your cow moves further along in her lactation period, her nutritional requirements will begin to change (refer to Senior 4-H Dairy Production, Publication 530).

Average Weights at Birth by Breed

Breed	Weight Lbs.
Jersey	50-60
Guernsey and Ayrshire	65-75
Holstein and Brown Swiss	85-100

DAIRY TERMS

To be successful with your dairy project, you must learn certain terms or definitions, including these:

Artificial insemination (AI) - Breeding a cow or heifer by placing semen in the reproductive tract.

Body capacity - The measured volume of the cow's or calf's capacity in terms of length, depth, and width of the barrel.

Bovine - A zoological term for the cattle species.

Breed association - A club or group interested in a certain breed of cattle.

Bull - A male that has not been castrated.

Calf - Cattle usually less than one year old.

Colostrum - The first milk produced by a mammal after giving birth. It is high in antibodies.

Concentrate - Class of feeds high in energy and low in fiber made up of grains, grain byproducts, or meal; can be high in protein.

Conformation - Size and shape of body parts analyzed individually and how the parts blend together.

Dairy character - The physical evidence of a cow's ability to produce large quantities of milk or a calf's potential milking ability.

Dam - The mother of an animal.

Dry period - The rest period between lactation periods when cows are not producing milk.

Fitting - Feeding, grooming, washing, and clipping an animal in preparation for show.

Forage or roughage - Class of dairy feeds made up of pasture, hay, and silage.

Freshen - When a cow gives birth and begins producing milk.

Gestation - The period from conception to calving.

Grade - An animal with the physical characteristics of a particular breed but not a purebred and not registered with the breed association.

Heifer - A young female that has not had a calf.

Lactation period - The length of time a dairy cow produces milk between freshening (calving) and drying off.

Mammary system - The udder, teats, and other tissues involved in producing milk.

Mastitis - An infection of the udder.

Milk processing plant - A factory where milk is clarified, standardized, pasteurized, homogenized, and packaged for shipment.

Nutrients - The substances in the feed an animal eats that provide nourishment. There are six classes: water, protein, carbohydrates, fats/lipids, vitamins, and minerals.

Pedigree - A record of an animal's ancestors or "family tree."

Polled - An animal born without horns.

Production - Amount of milk produced by a cow during a certain length of time.

Proven sire - A sire that has at least ten daughters with production records that may be compared with daughters of other bulls.

Purebred - An animal whose sire and dam are of the same breed and is registered or can be registered on the record books of the breed.

Ruminant - A mammal having a stomach with four compartments: rumen, reticulum, omasum, and abomasum. These animals chew their cud (ruminant) and include cattle, sheep, goats, deer, and camels.

Showmanship - Exhibiting an animal at a show involving proper fitting, showing, and exhibitor appearance.

Sire - The father of an animal.

Stature - The height of a cow or calf at the withers and hips.

Total digestible nutrients (TDN) - The part of the feed the animal actually uses to grow and to produce milk. The energy content of feed.

Total mixed ration (TMR) - Balanced ration where all ingredients are blended together, except for water.

Udder - The mammary gland of the cow, including the teats and secretory tissues.

Udder depth - The length of the udder from the udder attachment to the udder floor.

Weaning - The time when a young animal, typically 1 to 2 months of age, is taken off milk or milk replacer and eats dry feed and water.

Weight tape - A measuring tape you place around the heart girth to estimate weight. It can also be used to estimate height by measuring the heifer from front foot to the withers.



As a Mississippi 4-H Club member enrolled in the dairy project, you will know the thrill of watching a heifer grow and develop, showing her, caring for her, and having her come into production.

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