

THE COW

in 4-H
Dairying



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The Cow in 4-H Dairying



The dairy cow project may be a new project for you or a continuation of a calf and yearling project. This advanced dairy project will be interesting and provide many challenging experiences.

The dairy cow project is *Unit III* of the four-unit dairy project. *Unit I - The Calf* is suggested for younger 4-H club members, and a 6-month record is recommended. *Unit II - The Yearling Heifer* is preferably a continuation of Unit I, although 4-H members may start with Unit I or Unit II. This unit, *Unit III - The Cow*, is a continuation of your previous dairy projects. *Unit IV - 4-H Dairy Science* is an advanced unit that 4-H'ers may study with or without a project animal.

Your 4-H dairy cow project will be a learning experience that will demand a lot of hard work. How you develop this unit of your dairy project depends somewhat on your home situation. If you live on a dairy farm and have a commercial market for milk, your project cow will probably be fed and housed with the family herd. You may wish to develop your own dairy herd from your foundation animal. However, if your family has only enough land to raise a few dairy animals, you may use your dairy cow to produce milk for the family. The care and management of a dairy cow will differ under these two situations.

Purposes and Requirements

The purpose of the dairy cow project is to:

- Help you develop a record keeping system.
- Provide you with information on feeding and nutrition.
- Acquaint you with the principles in producing quality milk and milking procedures.
- Discuss the key areas of dairy cattle management.

As requirements for this unit, you must:

1. Own a dairy cow for the project year.
2. Develop and maintain a record keeping system for milk production and health and feed (amount and type).
3. Plan and evaluate a dairy cow feeding program.
4. Complete and turn in your 4-H record book to your leader on request.
5. Take an active part in dairy activities such as judging and demonstrations.
6. Exhibit your cow at a community, county, district or state 4-H dairy show.

Records

The records you keep on your dairy project are important; they will be used to measure progress, plan project goals and plan for the future. A 12-month continuous record will prove valuable in selection and culling.

Production records are absolutely necessary for your dairy cow project. You should take part in some kind of Dairy Improvement (DHI) testing program. This could be official DHI, owner-sampler or any other type of production test. If you do not use one of these programs, you can weigh the milk from each cow 1 day (morning and night) each month and record the production. You can estimate the fat produced by asking your dairy plant to test your cow's milk at least twice during the lactation. Local DHI fat-testing centers may also be willing to conduct a test, or your school may have milk testing equipment for running monthly tests.

Feed records are necessary to calculate yearly feed cost. Monthly totals should include the amount of feed used, the cost of feed per ton, type(s) of feed and total cost. This will be useful information to calculate dollar return over feed cost. To calculate return over feed cost for your cow or cows, use the following formula:

$$\frac{\text{Return over feed cost}}{\text{monthly income from milk sales} - \text{monthly feed expense}}$$

This method can be used on a daily, monthly or yearly basis.

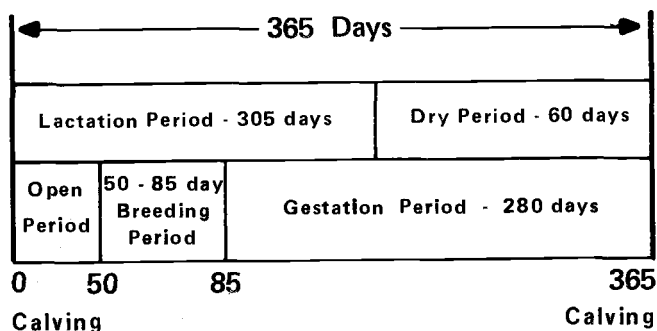
Health records consist of all breeding and calving dates, sex of calves born and bulls (sires) used. A complete record should be kept on the pedigree or history of each animal in your project. Be sure to record all health related information such as blood tests, vaccinations and diseases or sicknesses for each animal.

Financial records should include all income and expenses related to your project. You may want to itemize your expenses into categories such as feed, breeding, health, etc. This record will help you determine how much money your cow or project is making or losing each year.

Events Cycle for Your Dairy Cow

Your dairy cow or heifer begins a cycle of important events after calving. The sequence of events from calving to calving is usually called the **calving interval**. Optimum herd production usually occurs

when the calving interval is between 12 and 13 months. This chart gives you a close look at the calving interval cycle:



This breakdown is based on a 365-day calving interval. The length of the calving interval depends primarily on the date the cow successfully breeds after calving. If conception occurs approximately 85 days after calving, a 365-day interval will result. The following discussion will cover each of the events in the calving interval.

Calving Care

Your cow or heifer should calve in a clean, dry area. During the summer, a small well-shaded pasture is an excellent place for calving. In the winter, or if pasture is not available during the summer, a clean, dry box-stall or maternity stall is preferred. Keep this stall clean and well bedded.

Leave the animal alone at calving unless you see some evidence of trouble. An experienced person can help if you are unsure of her condition. A normal calving should only require 30 minutes to 1 hour. The calf is normally born with its front feet first, with the head positioned between the forelegs. If trouble or difficulties develop, call your veterinarian.

Check to see if the calf is breathing at birth. Remove any mucus that may be around the nostrils and mouth. If the cow doesn't lick the calf dry, wipe the calf with a clean cloth or feed bag. Apply iodine to the navel to prevent infection. This is best accomplished by dipping very well. Mark the calf with permanent identification as soon as practical.

Wash the cow's udder carefully with clean, warm water before the calf is allowed to nurse. As soon as the calf is on its feet, be sure it nurses and gets some colostrum.

You may choose to feed the calf by hand rather than letting the calf nurse immediately after birth. Feeding freshly drawn colostrum from the cow is an accepted method used by many successful dairy-men. The first feeding should be around 6 to 8

percent of the calf's body weight. This is roughly one-half to three-fourths of a gallon for a 100-pound calf. The first milking colostrum will give more anti-body protection than that from later milkings.

You should feed calves colostrum three or four times during the first 24 hours. Feed a total of 2 gallons of colostrum in the first 24 to 36 hours after birth. Continue to feed colostrum for 3 days.

The placenta or afterbirth will generally be passed an hour or so after calving. Remove it from the stall. If the fresh cow or heifer does not "clean" (expel the placenta) in a few days, contact your veterinarian.

Provide clean water for your heifer after she has calved. Continue to feed her the same grain forage ration she received before calving for the next few days.

Start milking your cow 12 hours after calving. A good practice is to milk the fresh cow or heifer at least once daily while the calf is nursing. Usually the calf will remain with the cow for 24 to 48 hours. Milking helps prevent congestion and mastitis in the udder. Milk from your fresh cow should not be marketed until it is free of colostrum. This will usually be a minimum of 3 to 7 days.

Lactation

The lactation period begins with calving and continues until dryoff. A standard lactation period consists of 305 days. The actual length depends on the length of the dry period and the time of successful breeding after calving. The end of lactation is usually determined to allow 45 to 60 days of dry time.

Milk production will peak 45 to 60 days after calving. After peak production is reached, the amount slowly declines until the end of lactation. The persistency of lactation (rate of decline) depends mainly on genetics and nutrition. Cows that fail to rebreed shortly after calving may have lactations in excess of 365 days. Average lifetime production is reduced with long lactation periods.

Breeding

Heat periods will start 3 to 6 weeks after calving. Watch and record each heat. They should occur every 18 to 23 days. Your project cow should be bred 50 or more days after calving. This date could be extended if problems were associated with calving or cleaning.

Select a highly plus proven sire for your cow. If your parents are dairy people, they could help with the selection. Artificial insemination by outstanding sires is available in most areas. Be sure to record the breeding information on your project.

Only about 60 percent of all cows conceive or "settle" on the first breeding. You will want to watch your animal closely 18 to 23 days after the first breeding to detect another heat if she fails to conceive (settle).

Gestation

The gestation period begins with conception (successful breeding) and continues to calving. Most gestations are around 280 days in length. There is a variation among breeds and also between individual cows.

Have a veterinarian check your cow for pregnancy 45 to 60 days after breeding. After your cow is confirmed pregnant, estimate her next calving date. This will be used to determine the date for ending the lactation period (drying off).

Drying Period

The dry period plays an important role in maintaining a profitable dairy project. The way you care for your cow during this period affects her health, the health of her calf and the level of production in the following lactation.

The dry period should be 6 to 8 weeks long. We used 60 days in the calving interval breakdown. The dry date is calculated by subtracting the dry period length from the predicted calving date. Your cow should be "dried off" quickly with a minimum of stress and irritation to the udder.

Cows free of mastitis can be "dried off" simply by not milking. High producers and cows with past mastitis histories require greater care. These cows may need several milk-outs to prevent excessive udder pressure and mastitis. Milk secretion in the cow usually ceases after 48 hours if she is not milked.

With high producing, hard to dry off cows, once-daily milking should be considered. In extreme cases, you may have to place an animal on dry feed and/or limit water intake for a few days.

A sound dry cow feeding program is important. Cows well-conditioned before calving produce more milk with greater lactation persistency. The general health of the calf at birth is also influenced by the cow's nutrition.

The dry cow requires protein for her own body and for fetal development. Total protein requirement is less than during lactation. Generally, you can supply daily protein needs by feeding 10 pounds of average quality alfalfa hay. A ration of 10 pounds of alfalfa hay plus low cost feeds such as corn silage is a favorite of many dairymen. Such a ration provides the basic needs at a low cost.

Energy in the ration helps replace the flesh lost during lactation. Grain added to the ration increases energy intake and results in weight gain. The amount of grain you should feed depends on the body condition of your cow. Many cows need little or no grain. Thin, under-conditioned cows should receive a few pounds each day. Do not, however, overfeed dry cows. Fat, heavily fleshed cows have more health problems and calving problems. Overfeeding is also costly and can reduce total herd profits.

Calcium and phosphorus are the two most important dry cow minerals. A 2:1 ratio of these minerals (2 parts calcium to 1 part phosphorus) in the total diet helps to prevent milk fever near calving.

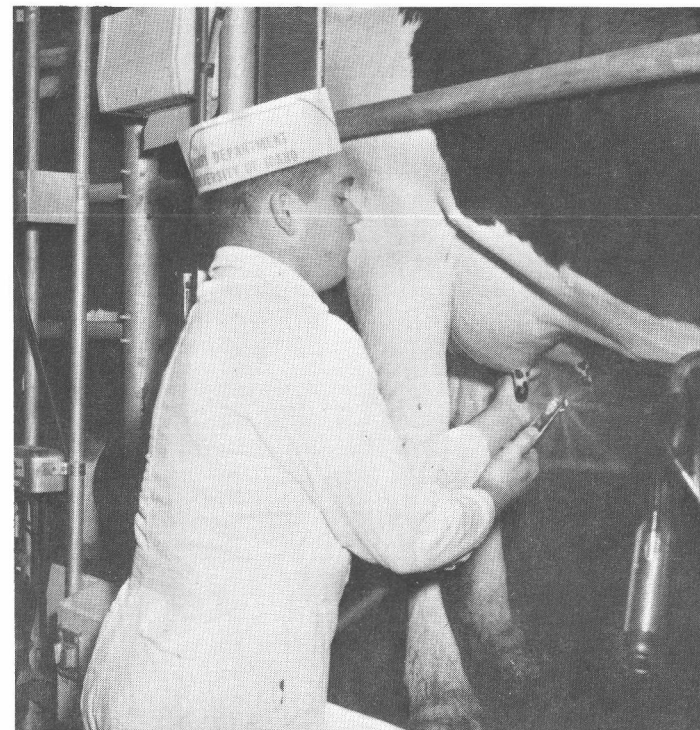
Milking Management

Good milking habits will pay big dividends in more milk, faster milking and healthier cows. The following will help develop sound milking procedures:

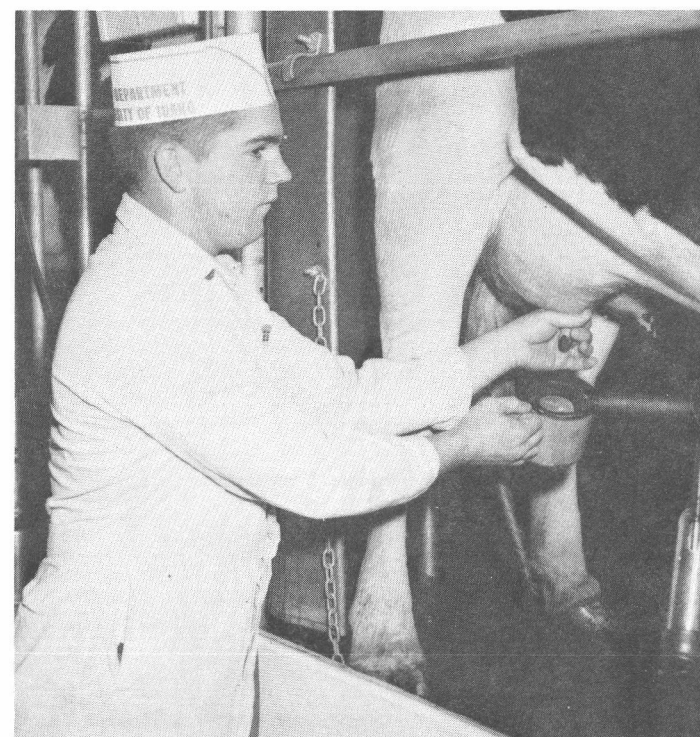
1. Train heifers immediately to milking machines. Be sure to milk your first-calf heifer completely dry at the first milking and each time thereafter. Complete milking of older cows at first milking, however, should be avoided and might induce milk fever up to 2 to 3 days after calving.
2. Wash the udder with warm water about 1 minute before you plan to attach the machine.
3. Milk a few streams of milk from each teat. Check for abnormal milk.
4. Dry the udder with a single-service paper towel.
5. Carefully attach the milking unit. Stay with your heifer during milking the first few days. Some gentle massaging may help to get the milk from the swollen udder. Remove the machine when the milk flow stops. Do not hand strip after removing the machine.
6. Dip each teat in a commercial teat-dip preparation.
7. Be regular and always follow the same routine each milking.
8. Be patient and gentle around all cows and especially new heifers.

Follow these same basic milking procedures to milk a cow by hand. Current timing of washing and drying the udder is just as important with hand milking.

Remember cows learn habits quickly. They perform best under regular feed and care. Any sudden change will disturb cows and reduce milk yield.

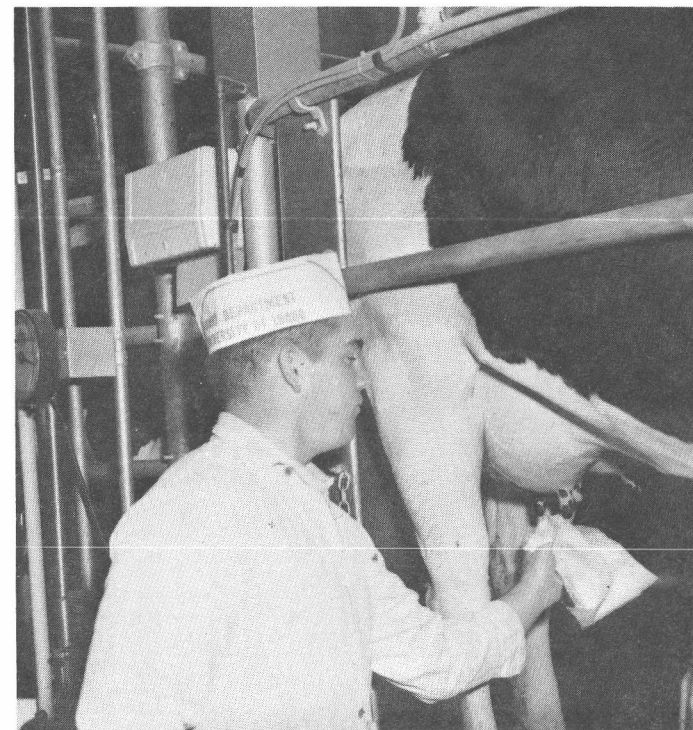


Step 1. Carefully wash the udder with warm water.

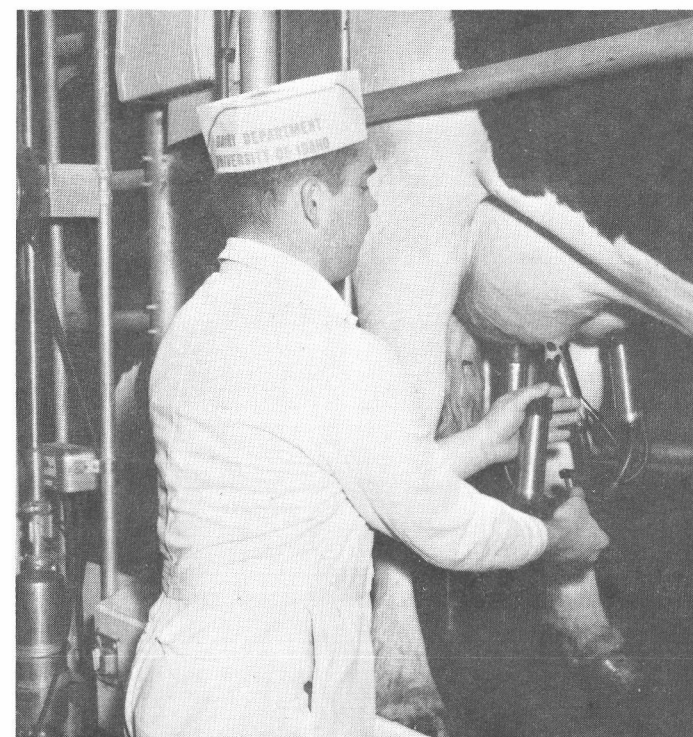


Step 2. Use a strip cup to milk a few streams by hand from each teat.

Proper Steps in Managed Milking



Step 3. Dry each teat with a clean, single-service towel.



Step 4. Apply the milker after milk letdown.

Milking Equipment

Learn to operate the milking machine properly. This will result in less mastitis, cleaner milk and faster milking. Apply the unit carefully, limiting air entry into the teat cups. Do not remove individual teat cups at the end of milking. Shut off the vacuum to the unit before removing the unit. Check the cow for complete milk-out.

Keep your machine clean and in good working order. Be sure to check for worn parts, leaky hoses, dirty vacuum lines and faulty operation of pulsators. Follow the manufacturer's recommendations in the operation of the machine.

Producing Quality Milk

You are now in a project that deals with a product for the commercial or home market. You will be expected, therefore, to learn and use sanitary milking procedures. You should always plan to produce the highest quality milk possible and need to become familiar with the following factors involved in producing quality milk.

1. **Healthy cows.** Quality milk can come only from healthy cows. Make sure your producing cows are free from all diseases such as Bang's disease, tuberculosis and mastitis.
2. **Clean cows.** Cows produce clean milk easier if they are kept clean winter and summer. Cleaning is faster and easier if the cow's udder and flanks are clipped.
3. **Clean milking parlor and barns.** Milk is a human food and should be produced in a clean, well-lighted and well-ventilated parlor or barn.
4. **Satisfactory barnyard.** If possible, the barnyard should be hard surfaced to make cleaning easier and to keep cows cleaner and healthier.
5. **Clean milking equipment.** All milking equipment should be properly washed and rinsed immediately after each milking. Just before the next milking, the equipment should be properly sanitized. Milking equipment dealers have recommendations you should follow for properly cleaning all equipment.
6. **Adequate milk house.** A room with adequate supply of hot and cold water where dairy equipment can be properly cared for is needed. The milk house should have some facilities for properly handling and cooling milk.
7. **Proper cooling.** Milk should be cooled as rapidly as possible to 40° F and must be protected from dust and heat until it is picked up by the hauler.

8. **Careful feeding.** To prevent off-flavors and odors, feeds such as silages should not be fed within 3 hours before milking.
9. **Properly functioning equipment.** Good equipment and a sound milking routine are necessary for the best results.

Remember, the processing or bottling plant that receives your milk cannot improve its quality. Milk quality begins on the farm.

If you have questions regarding the latest regulations on producing Grade A or quality manufacturing milk, contact your local leader, Extension county agent, dairy fieldman or a staff member of your local Department of Health.

Nutrient Requirements

Your cow's nutrient requirements are grouped into the following areas: energy, protein, minerals, vitamins and water. All of these nutrients are vital for growth, body maintenance, reproduction and milk production.

Energy provides the fuel for your cow. Energy is required for normal growth, reproduction, maintenance and milk production. Insufficient energy will lower the total milk production in early lactation. Severe and prolonged energy deficiency depresses reproductive function.

In dairy rations, energy is usually expressed as NEL (net energy for lactation) or the energy value of feeds in terms of its value for milk production. The nutrient requirement is also expressed as NEL. Total digestible nutrients (TDN) is the common energy value used by dairymen. TDN is an estimate of the energy of feeds. TDN is being replaced gradually by the net energy evaluation system.

Protein is required by all farm animals. The protein requirement in early lactation is extremely high. Protein furnishes the ruminant animal with nitrogen and amino acids for all the essential body functions. Amino acids are the building blocks for cells and tissues in the body. All protein secretions in the body, including milk, require specific combinations of amino acids.

Dairy cattle can only store small amounts of protein. Unlike energy, which the cow can store as body fat, protein requirements must be met on a daily basis. Protein shortages will reduce production in the cow. Many dairy cows receive inadequate protein during early lactation.

Minerals in a wide range are required for a dairy cow. Calcium and phosphorus are the two major minerals, and both are important in the milk production. Salt is also an important mineral and must

be included in your cow's ration. In the Pacific Northwest and Intermountain West, you should provide iodized and trace mineral salt to protect against an iodine mineral deficiency.

Trace minerals such as cobalt, magnesium, iron, copper, zinc, manganese, selenium and sulfur are required in small amounts. These minerals are usually adequate in normal rations with trace mineralized salt added at the rate of 20 pounds per ton. In some areas of the Northwest, specific trace minerals may be deficient and require special supplementation. Special needs for your cows can be provided by your Extension county agent.

Vitamins are essential for life, but only small amounts are required. Vitamins A and D are the two most important vitamins in the dairy rations. Usually quality roughages supply adequate amounts of these vitamins. Many dairymen and commercial feed mills add supplemental vitamins for added insurance to protect against deficiencies.

Water is another essential dietary substance needed by dairy cattle. A fresh, clean supply should always be available.

Feeds for Dairy Cows

Dairy cow feeds are divided into two general categories — roughages and concentrates. Roughages are feeds high in fiber, are bulky and are low in energy. Dry hay, silages and pastures are roughages and they may also be called forages. Other high fiber feeds such as corn cobs, straw and cottonseed hulls are also included in the roughage classification.

Concentrates are low in fiber and high in total digestible nutrients and energy. Concentrates include a wide variety of grains such as barley and corn. Protein feeds such as wheat bran, cottonseed meal, peas and beans are also concentrates.

Roughages

These feeds usually supply the cheapest source of nutrients in dairy cattle rations. In the Intermountain West and Pacific Northwest, alfalfa hay and silages are included in most rations. Roughages usually represent 50 to 80 percent of the total feed consumed by milking cows. The percentage of the roughage in the ration depends on the quality of the roughage, milk production of the cow, milk price and the relative price of available feeds.

You can calculate the cost of feed nutrients with this formula:

a. $2,000 \text{ pounds} \times \% \text{TDN (total digestible nutrients)} = \text{pounds TDN in 1 ton feed.}$

b. $\text{Price per ton of feed} \div \text{pounds TDN in 1 ton feed} = \text{cost per pound of TDN (Table 1).}$

Table 1. Examples of nutrient costs.

Feed	%TDN as-fed basis	Price per ton	Price per lb. TDN
	(%)	(\$)	(¢)
Alfalfa hay	55	\$ 80	7.3¢
Corn silage	16	20	6.3
Grass silage	16	18	5.7
Grass hay	45	50	5.5
Grain	74	130	8.8
Pasture*	14	8 (rent)	2.9

*Assume cows eat 150 pounds per day; monthly rent per cow is \$18.

The quality of roughage makes a difference in cost per pound of TDN. Cows will consume larger amounts of quality roughage, reducing the requirement for concentrates. Production also increases with higher quality feeds. You can have your roughages analyzed for nutrient content. Contact your local university Extension office for assistance in planning a forage testing program.

Concentrates

These feeds are used to add "concentrated" feed nutrients to the ration and they usually contain more feed nutrients per pound than roughage. Concentrates may add protein, energy, vitamins and minerals to the dairy ration.

Table 2. Average nutrient composition of some common dairy feeds.

Feedstuff	Dry matter	Crude protein	TDN	NE,* (MCAL/lb)
Hay				
Alfalfa	90	17.2	58.0	.59
Bromegrass	90	7.4	54.0	.54
Red clover	88	14.9	59.0	.60
Ladino clover	91	23.0	61.0	.62
Oats	88	9.2	61.0	.62
Orchardgrass	84	10.2	62.0	.63
Silages				
Alfalfa	30	17.2	58.0	.59
Corn, cannery waste	23	8.8	72.0	.74
Corn, dent, well eared	35	8.0	70.0	.72
Corn, dent, not well eared	25	8.4	65.0	.67
Oat silage	32	9.7	59.0	.60
Concentrates				
Barley	89	10.7	82.0	.86
Molasses, dried pulp	91	8.0	78.0	.81
Corn	89	10.0	88.0	.92
Cottonseed meal	93	44.0	77.0	.80
Brewers grain	92	26.0	66.0	.68
Wheat	89	11.5	88.0	.92
Oats	91	10.1	77.0	.80
Wheat bran	89	18.0	70.0	.72

*Net energy for lactating cows in Mega calories per pound feed.

A commercial dairy concentrate may contain a variety of grains plus supplemental vitamins and minerals. Such prepared dairy feeds are usually sold with different levels of protein. The protein content for your cow or herd will depend on the source of roughage, quality of roughage, amount of concentrate and production per cow. Some example rations are listed in this publication.

Many dairymen have custom concentrate mixtures prepared to supplement roughages. Grain can also be processed and blended on the farm to meet the same objective. If you only have a single cow, you can buy bagged dairy feeds at most feed mills.

A prepared concentration will vary in feeding value depending on the types of ingredients. Commercial feeds carry a feed tag that will list the nutrient content and feed ingredients. The feeds contained in the mixture must be listed in order from highest percentage to lowest percentage. High quality concentrates will contain barley, corn or other high energy grains. The average composition of common dairy feeds are listed in Table 2.

Determining Grain Needs

Most dairy cows are fed grain according to production. A rule of thumb is to feed 1 pound of grain for each 3, 4 or 5 pounds of milk produced daily. This rule is only a guide because the amount of grain required per day is dependent on many factors. DHI records provide recommended levels of grain per cow. These amounts should also be used as feeding guides.

A simple formula can be used to determine an approximate amount of grain to feed:

$$\frac{\text{monthly fat production} - 30}{2} = \text{pounds of concentrate to feed}$$

Example: A cow is producing 60 pounds of fat per month.

$$\frac{60 - 30}{2} = 15 \text{ pounds of concentrate}$$

This method is a guide similar to the rule of thumb method. Try varying the amount of grain, and watch your cow for changes in production.

Challenge Feeding

Another method of feeding grain is called lead feeding or challenge feeding. The basic objectives are: (1) to prepare the cow for high production by feeding grain before calving; (2) to challenge the cow early (first 60 days) in lactation to reach her maximum production potential; and (3) to reduce grain feeding as production declines (after 100 days) after peak production is reached.

This method differs from “feeding according to production” because the amount fed is slightly above the cow’s requirements. These extra nutrients will stimulate her to produce to her maximum genetic level. Challenge feeding is most successful during the first 3 months of lactation.

Feed changes should be made gradually. After calving, allow at least 2 weeks to get the cow on full feed. Whenever grain is left in the manger, reduce the amount of grain at the next feeding.

Group Feeding

Challenge feeding is an individual cow proposition with each cow fed grain as an individual. In large herds and large milking parlors, dairymen find this kind of system difficult to manage. Many have adapted the principles of lead feeding to their conditions by grouping cows according to production and feeding each group different levels of grain.

Group feeding doesn’t allow close control of each animal but is more profitable for some dairymen. In feeding, the most important point is to make the most profit from each cow or the total herd. Mem-

bers should remember that it may not be practical to feed a family cow for maximum production. Reducing grain intake will reduce milk production.

Complete Rations

Many large dairy operations offer cows complete rations. The rations consist of blended roughages and concentrates to meet the nutrient requirements of each production string in the herd. This program insures that each mouthful a cow consumes is balanced to meet her daily needs. This system is preferred by most dairymen with large herds.

Computer Ration Analysis

Several feeding programs based on computer analysis are available to dairymen. To gain experience in planning a feeding routine for your dairy project, discuss these programs with your local Extension office. Least-cost programs on the computer can rapidly formulate rations based on return over feed cost. Other programs can analyze your current ration and detect deficiencies. These programs maximize profits and insure that the ration meets the cow’s nutrient requirements.

EXAMPLE RATIONS*

For high producing cows:

Feed	pounds	Feed	Pounds
Alfalfa hay	25	Alfalfa hay	12
Dairy concentrate (12% crude protein)	26	Corn silage	39
		Dairy concentrate (18% crude protein)	26
Adequate energy for 70 pounds of milk		Adequate energy for 70 pounds of milk	
Adequate protein for 73 pounds of milk		Adequate protein for 80 pounds of milk	

For medium producing cows:

Feed	Pounds	Feed	Pounds
Alfalfa hay	29	Alfalfa hay	12
Dairy concentrate (12% crude protein)	16	Corn silage	51
		Dairy concentrate (18% crude protein)	16
Adequate energy for 53 pounds of milk		Adequate energy for 53 pounds of milk	
Adequate protein for 66 pounds of milk		Adequate protein for 62 pounds of milk	

For low producing cows:

Feed	Pounds	Feed	Pounds
Alfalfa hay	25	Alfalfa hay	12
Dairy concentrate (12% crude protein)	10	Corn silage	39
		Dairy concentrate (18% crude protein)	10
Adequate energy for 32 pounds of milk		Adequate energy for 32 pounds of milk	
Adequate protein for 50 pounds of milk		Adequate protein for 45 pounds of milk	

*Based on a 1,350 pound cow producing 3.5 percent fat milk.

Goals and Plans

Your dairy project records will provide basic information for setting herd goals. You may want to set goals in several areas: (1) increased production per cow; (2) increased return over feed cost; (3) increased herd size; (4) improved genetics; (5) shorter calving intervals and (6) lower production costs.

Goals are important and give direction to your management decisions. Little progress is made by accident. Progress is setting goals and managing to reach these goals. Most successful dairymen rely on a carefully designed plan — a plan to insure success with their herds.

The dairy future is bright. Over the years, dairying and dairy cows have produced stable incomes and quality living for a vast number of families in the Northwest. And you may have opportunities within your own family. Your parents may be looking for an enterprising, young addition to their dairy management team.

Don't overlook the many dairy related occupations available for persons with a dairy background. Your 4-H dairy cow project has provided a step toward unlimited opportunities.

Cow Talk

Artificial Insemination (artificial breeding) — To breed a cow manually with semen collected from a bull.

Bacteria — One-celled plants found in or on almost everything. Bacteria are so small they can be seen only with a microscope. Germs are bacteria. Some bacteria are good; others are not.

Bang's Disease (brucellosis/contagious abortion) — A disease causing animals to lose unborn young before they are due. Humans may contract undulant fever, a human brucellosis, by drinking contaminated unpasteurized milk or by handling contaminated carcasses.

Calves — Young cattle under 12 months old.

Carbohydrates — Nutrients in food that provide energy to keep animals warm and for movement and body functions. Sugars and starches. Extra carbohydrates are stored in the body as fat.

Chlorine Solution — A chemical solution containing chlorine used to sterilize milking equipment, pails, cans and other utensils. Used to kill bacteria, not for cleaning.

CI (calving interval) — The months or days between calving in a cow or the average for a herd.

Colostrum (ko-los-trum) — The milk a cow gives the first few days after birth of young.

Concentrates — Feeds high in food value (TDN) (NEL): grain.

Contaminated — Dirty, polluted, soiled or unclean; contains germs or other undesirable materials; unfit for certain uses.

Cull — An undesirable animal; one that is unprofitable, low-producing or of poor type.

Dairy Character — Free of excess flesh, lean, angular, clean-cut, alert; not wild or nervous; characteristics desired in dairy cattle in contrast to beef animals.

DHI (Dairy Herd Improvement) — A modern, computerized, production record keeping system.

Dam — A female parent; mother.

Dehorn — To remove horns or prevent horns from growing on animals.

Dry Period — The nonlactating period just before calving. Recommended dry period is 6 to 8 weeks.

Drying Off — Used to describe the termination of lactation. To stop milking a cow. Sometimes referred to as "dried off."

Forage — Plants eaten in their natural growing state, fresh cut or preserved as silage, hay, etc. Roughages.

Gestation Period (jes-ta-shun) — Length of time an animal carries its young during pregnancy. (Period from breeding to calving.)

Green Chop — Freshly cut forage fed to livestock.

Heart-girth — The chest measurement of an animal, made around the body just behind the front legs.

Heat (estrus) — Period of sexual receptivity in the cow. Cows in heat are usually bred 50 days after calving.

Inheritance — Traits and characteristics that animals get from their parents and grandparents.

Lactation — Milk-giving period from freshening date to dry period.

Legumes — A group of pod-bearing plants (that "fix" nitrogen in the soil) grown for livestock feed such as clovers, alfalfa, vetch, peas and beans. High protein.

Mammary System — Organs and glands which make, secrete and store milk. In cattle, the udder, milk veins, teats, etc.

Mastitis (mas-ti-tis) — Disease of the udder of milk-producing animals. Germs may cause stringy, lumpy, bloody or watery looking milk. The whole udder may become enlarged and feverish. Some-

times animals lose milk producing ability from having had mastitis.

Mature Equivalent — Milk and milkfat production of a cow of any age, adjusted to mature age, 305 days and twice-a-day milking.

Milk Fever — A nutritional disease cows may contract near calving. Caused by an imbalance of calcium and phosphorus.

Milk Veins — Large blood vessels that show on the surface of the udder and underline of milking cows. Milk veins carry blood away from the udder back to the heart.

Minerals — Chemical elements in food that aid development of bone, hair, teeth, production and normal body functions.

NEL (net energy for lactation) — The energy value of a feed for producing milk or a measure of energy for production. Energy requirements for dairy cows are expressed in NEL values.

Parasites — Plants, insects or small animals that live in or on other living plants or animals; internal parasites such as stomach worms, grubs, etc.; external parasites like lice, mites, etc.

Persistency of Lactation — The rate of decline in daily production after peak production is reached. Usually expressed as a percentage of the previous month's milk production. A cow producing 100

pounds in January and 90 pounds in February would have a persistency of 90 percent.

Proven Sire — A bull with enough daughters whose records of milk and milkfat have been compared with herdmates. Shows how the bull influences the production of his daughters above or below the average for the breed. A record of a bull's ability to transmit milk and milkfat production to his offspring.

Retention of Afterbirth — The membranes (placenta or afterbirth) surrounding the calf are not expelled after calving. Most cows "clean" (expel membranes) a few hours after calving.

Return Over Feed Cost — The value of the milk produced after feed expense has been subtracted.

Sanitation — Keeping things clean. Keeping equipment, stalls and buildings free from conditions that might damage the health of livestock.

Settle or Conceive — A successful breeding resulting in pregnancy.

TB (tuberculosis) — The common term used to speak of the infectious disease, tuberculosis.

Udder — The milk gland of mammals (animals that suckle their young), having two or more teats.

Yearling — A young animal between 12 and 24 months old.



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