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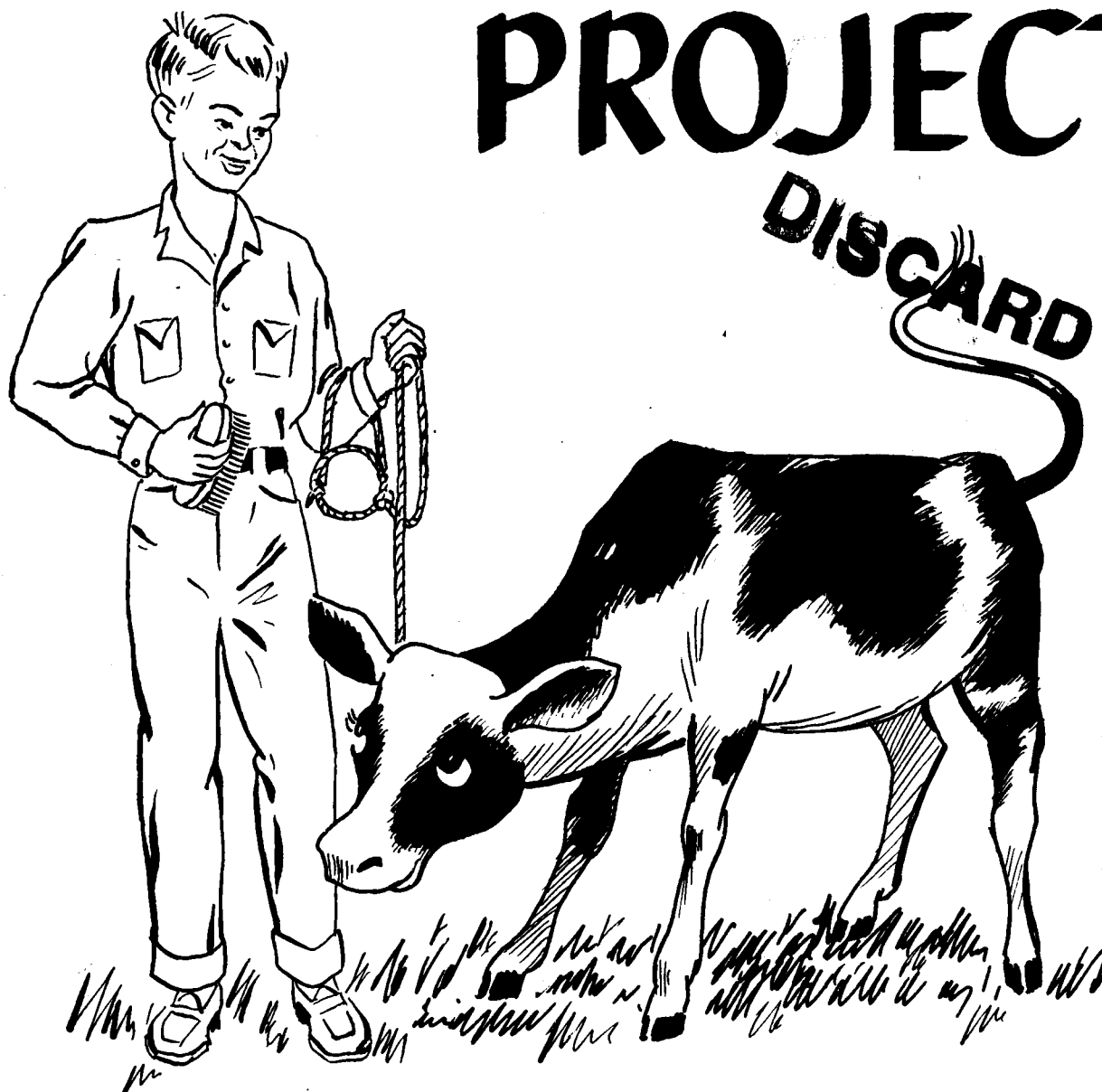
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YOUR 4-H DAIRY PROJECT

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Corvallis

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Club Series H-21

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Requirements

To be a member of a 4-H Dairy Project, you must:

- Be at least 9, and not more than 21, years old before January 1 of the club year.
- Own at least one dairy-type heifer calf, heifer, or cow. Your animal need not be a purebred, but should be one you are proud to own. Register purebred animals in your name.
- Have your first animal and start your 4-H Dairy Project by June 1. After the first year, your project and records should carry the year around.
- Be responsible for feeding and caring for your own animals. Do most of the work yourself. Do all of the fitting and training for shows.
- Keep a record of your dairy project, expenses, income, and activities in your 4-H Livestock Record Book. Give the completed record book to your 4-H Club leader or County 4-H Extension Agent at the close of the club year.

Prepared by D. E. ANDERSON

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The author acknowledges assistance from Professors F. B. Wolberg, I. R. Jones, R. G. Sprowls, J. O. Young, and Roy W. Stein of the Dairy Department; Oscar N. Hagg, Extension Dairy Marketing Specialist; H. P. Ewalt, Extension Dairy Specialist; and Cal G. Monroe, State 4-H Club Agent.

Your 4-H Dairy Project

FAVORABLE CLIMATE AND EXCELLENT FORAGE make dairying an important and well-paying job in the Northwest. A 4-H dairy project will make some money for you IF:

- . . . You have good animals, and
- . . . You do a good job feeding and managing them.

► In a 4-H dairy project you get a chance to learn:

- How to—
 - select good dairy animals
 - feed and care for them
 - keep and use records
- Responsibility—by caring for an animal of your own
- Business ability—by having a job of your own

► To be a successful 4-H dairy club member you need:

- Time each day to care for your animals
- A shed or barn to protect them from bad weather
- Good pasture, hay, and grain for feed

Good dairymen carefully select and raise their cows. The success of **this** project will depend on **your** . . .

- . . . Choosing a good animal
- . . . Feeding her well
- . . . Caring for her properly—and on **YOUR**

enthusiasm

effort

judgment

Remember: Raise only the better calves

- . . . It costs as much to raise a poor calf as a good one
- . . . These costs will vary according to
 - feeding methods
 - feed costs in your community

Selecting Your Calf

The Breed

Choosing your dairy calf breed is your first consideration. Will it be Jersey, Holstein, Guernsey, Ayrshire, Milking Shorthorn, or Brown Swiss? Your choice depends on the kind you like, its availability and cost, and the product you will market. Availability of good sires and the breed on your parents' farm also may influence your choice. "Artificial insemination" (see Cow Talk, page 29) service from Holstein, Guernsey, and Jersey bulls is available in most communities.

A carefully selected high-grade calf will do very well for your 4-H dairy project if you cannot get a purebred. Choose your calf from good type, high-producing parents.

Age of Calf

If you are 9, 10, or 11 years old, a young calf will give you experience and training—while you grow with the animal.

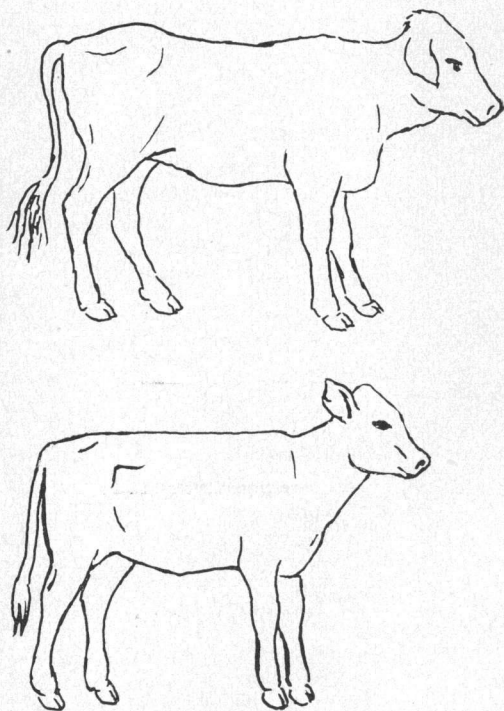


FIGURE 1. Select good type, strong, healthy calves like the one at bottom of picture.

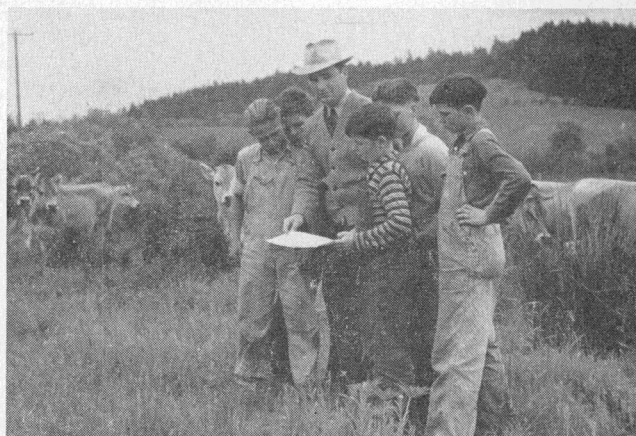


FIGURE 2. Club members look at records for help in choosing a calf.

Older members, anxious to get income from milk and offspring, may choose an older heifer or a producing cow. Additional cost of an older animal will be offset by earlier returns from milk and calves. From a producing angle usually there is an advantage to having your animal freshen in the fall.

Get the exact birth date of your animal at purchase time. If your animal is a purebred, arrange for registration or transfer of registration to your name.

Animal Health

Select your animal from a healthy, disease-free herd. Be sure it is healthy, vigorous, and average-size for the breed and age. If "Bang's vaccination" (See Cow Talk, page 29) is preferred for your farm, the animal should be officially Bang's-vaccinated during the age of 5 to 8 months. The veterinarian should eartag or tattoo the animal. You will need a certificate of vaccination. Keep it in your record book.

Don't choose a calf with a rough hair coat, a "pot belly," or one that is thin or stunted. These show improper feeding or ill health. Choose a calf with a healthy, glossy coat of hair, pliable skin, thrifty condition, and alert appearance.

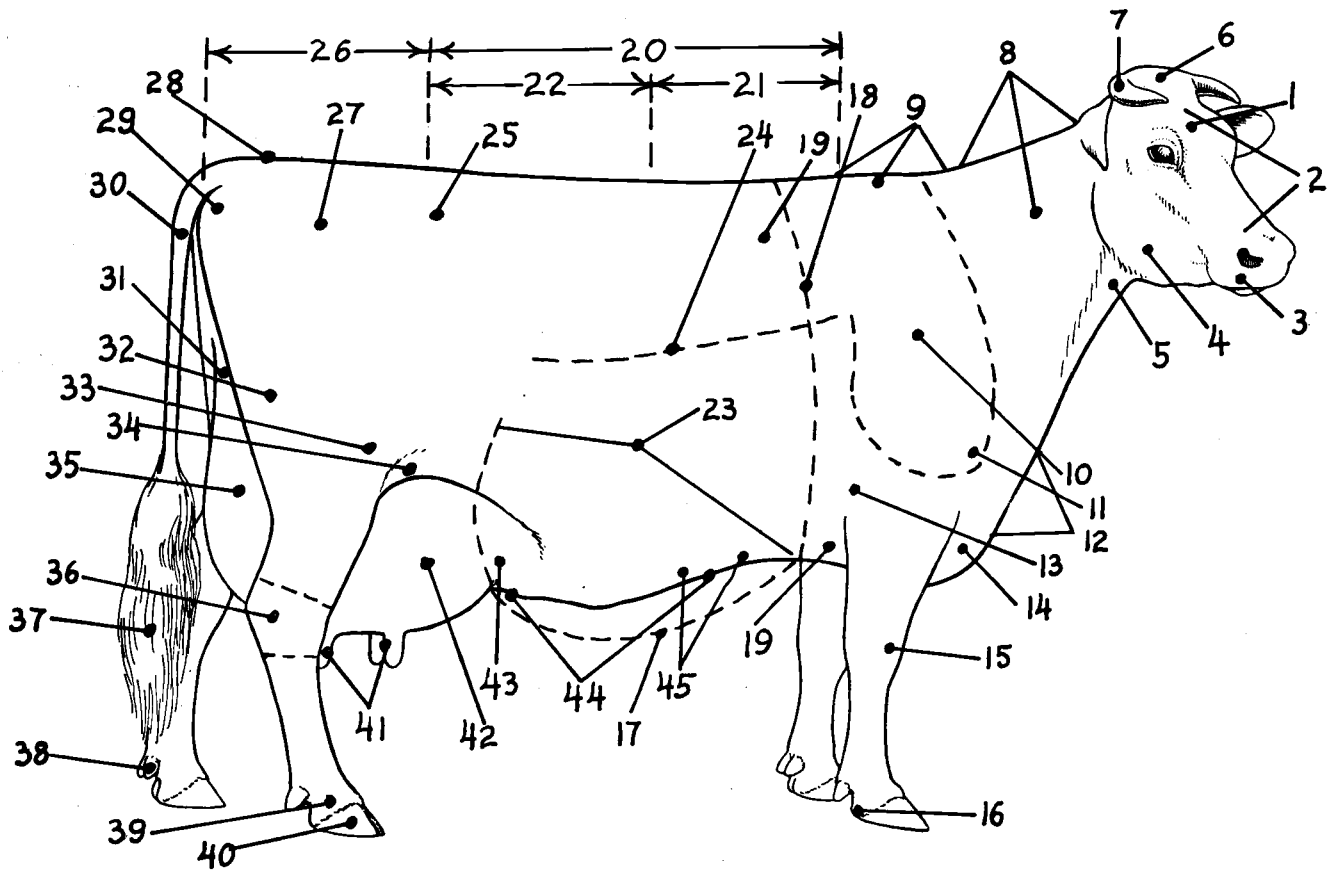


FIGURE 3. Parts of a dairy cow:

- | | | |
|-----------------------|-------------------|---------------------------|
| 1. Forehead | 16. Heel | 31. Rear udder attachment |
| 2. Face | 17. Chest floor | 32. Thigh |
| 3. Muzzle | 18. Heart girth | 33. Stifle |
| 4. Jaw | 19. Crops | 34. Flank |
| 5. Throat | 20. Back | 35. Rear udder |
| 6. Poll | 21. Chine | 36. Hock |
| 7. Horns | 22. Loin | 37. Switch |
| 8. Neck | 23. Barrel region | 38. Dew claw |
| 9. Withers | 24. Ribs | 39. Pastern |
| 10. Shoulder area | 25. Hip | 40. Hoof |
| 11. Point of shoulder | 26. Rump | 41. Teats |
| 12. Dewlap | 27. Thurl | 42. Fore udder |
| 13. Point of elbow | 28. Tail head | 43. Fore udder attachment |
| 14. Brisket | 29. Pin bone | 44. Milk veining |
| 15. Knee | 30. Tail | 45. Milk wells |

You may check a calf for normal size and growth by comparing its measurements with growth and weight charts given in tables 2 and 3 on pages 11 and 12.

Type and Conformation

You can see the desirable points in type and conformation by comparing several calves side by side. The good calf is clean cut, not too heavy boned, angular in form, and sharp over the withers. Wide spread of rib, a deep, wide chest, and a large barrel in proportion to the rest of the calf are desirable. Look for loins and rumps that are long, level, and wide. Mammary development should show four teats placed squarely and wide apart. With some knowledge of the "Dairy Cow Score Card," the parts of an animal, and practice in judging, you can select your calf.

The first animal may be the foundation of your future herd—make a good selection.

Judging Dairy Cattle

Judging dairy cattle helps you make a wiser choice in selecting animals.

It's fun to judge livestock—but learning to judge is not always easy or quick. You can learn the qualities of good animals, why certain features are desirable, and the characteristics of each breed. You can compare the desirable and undesirable features of different animals. Then you have a good start at be-

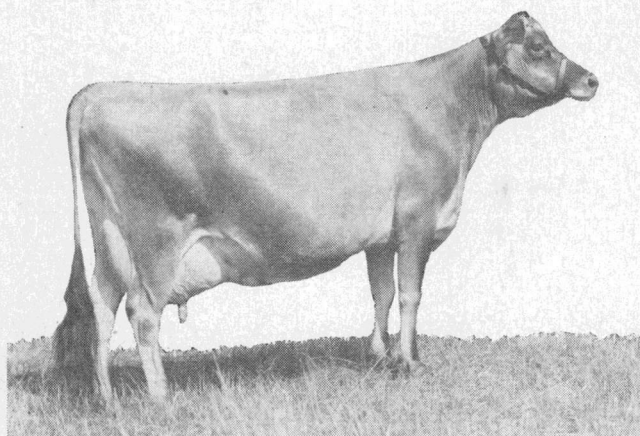


FIGURE 4. Excellent cow. Has good body capacity and dairy character.

coming a judge of livestock. Learn names of the parts of an animal as shown in figure 3. Learn the importance of the different parts. Keep in mind a picture of the ideal animal while you judge.

Judging will be easier when you learn the value of different body parts, desirable qualities, breed characteristics, and defects of dairy cows. Use the "Unified Dairy Cow Score Card," prepared by the Purebred Dairy Cattle Association, to evaluate dairy animals for type.

Practice judging at every opportunity—at home, at club meetings, on tours, field trips, and fairs. Watch judges in action, and listen to their reasons.

Pedigree and Production Records

Select your calf from ancestors that have high production records for several successive years. This shows inheritance of good "fertility" (See Cow Talk, page 29), as well as longtime production. It's fine to have a long line of good ancestors. Give most consideration to sire, dam, and grandparents of your calf.

The dam should be a good producer and of desirable type. Her production record for twice-daily milking should be at least 400 pounds of milkfat, or 10,000 pounds of milk as a 2-year-old. Her mature record should be at least 500 pounds milkfat or 12,000 pounds milk. She should milk for 10 months, and have a calf every year. Her sisters and half-sisters should also have good production records.

The sire should be of desirable breed type and body development, good size, and should have dairy character. A desirable proven sire is one with at least 10 daughter-dam record comparisons. His daughters' production should be greater than their dams, and above the average for the breed.

Female ancestors should be of good type and have large feed capacity. They should

have large, evenly shaped udders firmly attached in front and rear. Teats should be medium size and squarely placed. Good veining on the udder and large milk veins on the underline in front of the udder are desirable.

Ownership and Financing

You **MUST** own your 4-H dairy animals.

If possible, finance the dairy project with your own money. If you need help, make a businesslike agreement with your parents, or

borrow from a bank. Be sure to make payments when due. If you borrow money, you may want to insure the animal to protect you and your creditors in case it dies. Livestock insurance is available at reasonable rates for 4-H Club members.

Should your animal die during the club year, you may continue as a club member. Attend meetings and tours, enter contests, and complete your record book to get credit for the project.

Raising Your Calf--Birth to Yearling

Careful feeding and handling of the calf is **MOST** important during the first few weeks of its life. A calf should stand and nurse within 2 hours after birth. You will need to assist the calf if it does not nurse by itself.

A baby calf needs the first (colostrum) milk from its mother. Colostrum milk is much higher in protein, minerals, and vitamin A than ordinary milk. It is laxative and contains substances that protect newborn calves against certain digestive troubles.

Leave the calf with its mother for about 48 hours. Then put it in a clean pen by itself and feed with a nipples pail. Use its mother's milk for the first 4 or 5 days. Warm the milk to body temperature.

Milk Feeding

Always use a clean bucket. Weigh or measure the milk to have the right amount. Feed 1 pound of whole milk a day for each 10 pounds of calf. The amount of milk fed daily should be equal to 10 per cent of the calf's weight and fed in 2 equal feedings. A 60-pound Jersey calf would get 3 pounds of milk twice a day; a 90-pound Holstein would get 2 feedings of $4\frac{1}{2}$ pounds each. As your calf grows, increase the milk. Do not over-feed.

A weak calf may need its milk 3 times

daily for several days. Feed your calf regularly—about the same time daily—and have milk at the same temperature.

If your calf should get dysentery or scours, omit milk for 1 feeding. Feed only half the regular amount for the next 2 days. As your calf improves, gradually increase milk to the normal amount. Careful feeding during the first 3 weeks will help prevent digestive troubles and produce more rapid growth.

A thrifty calf can be gradually changed to skim milk after 3 weeks. A small, unthrifty calf will need whole milk for a longer time. When you change to skim milk, change

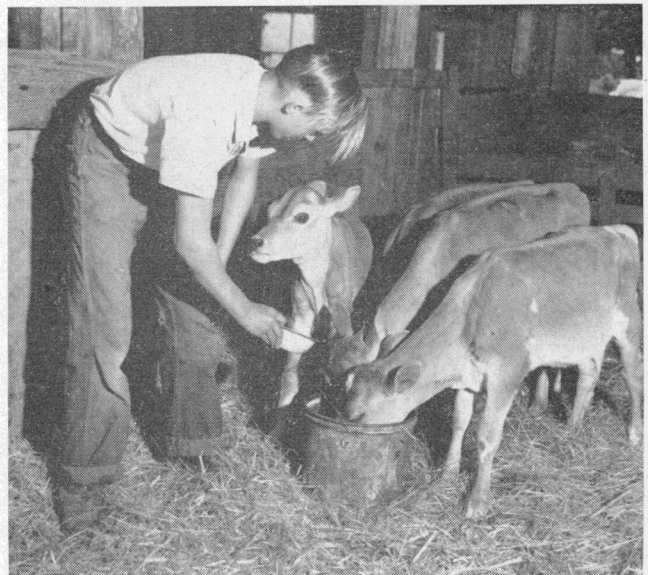


FIGURE 5. Calves learn to eat dry feed at an early age.

TABLE 1. DAILY FEEDING SCHEDULE WHEN SKIM MILK IS AVAILABLE

Age	Milk	Grain	Good quality hay	Silage or roots	Water, salt, bonemeal	Pasture*
First 48 hours	Nurse dam	.....	.....	.....	.....	.....
3 to 14 days	Whole milk— 6 to 10 pounds	.....	.....	.....	.....	.....
Third week	Whole milk— 6 to 14 pounds	Handful	Handful	.....	.....	.....
Fourth week	Gradually change to skim milk	Accessible	Accessible	.....	.....	.....
Second month	Skim milk— 10 to 16 pounds	1 pound	All calf will eat	.....	Accessible†	.....
Third month	As above	1½ pounds	All calf will eat	.....	Accessible†	Small amount
Fourth month	As above	2 pounds	All calf will eat	Small amount, 2 or 3 pounds	Accessible†	Small amount
Fifth month	As above	As above	All calf will eat	4 to 6 pounds	Accessible†	Increasing amount
Sixth month	As above	As above	All calf will eat	5 to 6 pounds	Accessible†	As above
6 to 12 months	Skim milk to 8 or 10 months if available	1 to 3 pounds as needed for good growth	All calf will eat	10 to 18 pounds	Accessible†	After 6 months good pasture may serve as only roughage

* Pasture can be utilized in increasing amounts in place of hay alone, or hay and succulent feeds, as the calf gets older.

† Water may be supplied twice daily.

gradually over a 4- or 5-day period. Continue to feed skim milk for 6 to 8 months, if you can get it at a reasonable price. After 6 months, healthy calves will do well on grain and hay or pasture.

Powdered skim milk, feed grade, mixed at the rate of 1 pound to 9 pounds of warm water, is a good substitute for freshly separated milk. Use powdered skim milk if you can buy it at a reasonable price.

Calf Meal

When you have no skim milk, your calf can be grown out on calf meal after the whole-milk feeding period. Purchase calf meals or save money by mixing your own. Calf meal should be tasty and supply animal proteins.

The following mixture makes 100 pounds of calf meal. It has given good results at the Oregon Agricultural Experiment Station:

- 35 pounds ground oats
- 25 pounds ground yellow corn
- 12 pounds wheat bran
- 10 pounds linseed oil meal
- 10 pounds dried skim milk powder (feed grade)
- 5 pounds blood meal or an additional 10 pounds of dried skim milk powder
- 1 pound salt

Feed this calf meal dry. Starting the second week of the whole milk feeding period, feed your calf a small amount of calf meal and good quality hay. Your calf should eat 1 to 1½ pounds of the meal daily, when 4 to 6 weeks old. You can stop feeding whole milk then. Your calf will eat about 2 pounds of calf meal daily when 7 to 8 weeks old. After 3 months, limit meal to 3 or 4 pounds daily, depending on size of calf and quality of hay.

Have fresh, clean water for your calf at all times.

Grains with Skim Milk

A grain mixture of whole, rolled, or coarsely ground homegrown grains gives good results with skim milk. Oats alone, fed

whole, rolled, or coarsely ground are also good. (See table 1.)

Start a calf on grain during its second week. Put a small handful in the manger or feed box as the calf finishes its milk. At 3 weeks your calf should have all the grain it wants. By the time your calf is 6 to 8 weeks old, it will eat about 1 pound of grain daily—at 3 months, 2 pounds daily with good quality hay. This is enough to keep your calf growing vigorously.

With skim milk and good hay, any of the following grain mixtures are good:

Mix No. 1

- 50 pounds ground barley
- 50 pounds ground oats, or wheat bran
- 1 pound salt
- 1 pound sterilized bonemeal

Mix No. 2

- 60 pounds ground oats
- 20 pounds ground barley, or corn
- 10 pounds wheat bran
- 10 pounds linseed oil meal
- 1 pound salt
- 1 pound sterilized bonemeal

Mix No. 3

- 25 pounds ground oats
- 25 pounds ground wheat
- 25 pounds ground barley
- 25 pounds wheat bran
- 1 pound salt
- 1 pound sterilized bonemeal

Mix No. 4

- 100 pounds oats, fed whole, rolled, or coarsely ground
- 1 pound salt
- 1 pound sterilized bonemeal

Hay

At about 2 weeks, your calf will eat hay. Give her all the good-quality hay she wants. Legume hay—clover, alfalfa, or vetch—is very good, but must be fed carefully to baby calves as it is laxative. Grass, grain, or mixed hay of the best quality—green, leafy, and fine-stemmed—is satisfactory.

At first, only a small amount of hay, fresh daily, is needed. Gradually increase hay as your calf grows. In 5 or 6 months, your calf will eat 3 to 5 pounds of hay per day. Green,

leafy hay is a good source of Vitamin D and carotene, the source of Vitamin A. These help keep your calf healthy.

Legume hays are better than grass and grain hays for calves over 3 months old. Cut grass and grain for hay before they get too ripe. Cure hay so it will keep as much of the green color as possible.

Succulent Feeds

Silage, kale, or root crops may be fed in limited amounts after 4 months. Feed 2 or 3 pounds daily with hay. Increase to 5 or 6 pounds at 6 months. Feed larger amounts to older animals.

Pasture

Your calf will begin to eat grass at 3 to 5 months, but needs plenty of other feed to keep growing. For best growth, feed your calf grain, even with good pasture, until 12 months old. After a year, she will grow normally on good pasture alone.

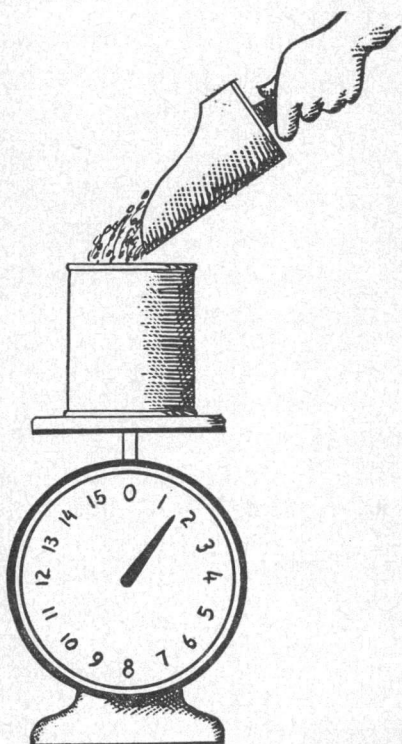


FIGURE 6. Measure grain feeds. Keep record of amount fed.



FIGURE 7. Feed calves all the good-quality hay they want.

Dryland pasture may provide enough early feed. Watch heifer's condition and growth, and condition of the pasture. Start feeding grain or hay before pasture gets too short.

Minerals

When calves are raised with plenty of high-quality roughages supplemented with necessary amounts of grain, there will be little need for additional minerals, except salt and bonemeal. Both should be in the grain mix or the calf meal. Milk provides calcium and phosphorous to the baby calf. After the milk-feeding period, your heifer should have salt and sterilized bonemeal in a box where she can get it free-choice, in addition to grain.

Vitamins

Vitamins A and D are likely to be lacking in feed for young calves. Whole milk provides Vitamin A if the cows are fed green, leafy hay, or are on pasture. As the calf gets older, it will get enough carotene to make Vitamin A from roughage—hay, pasture, and silage. Vitamin D is in sun-cured roughages.

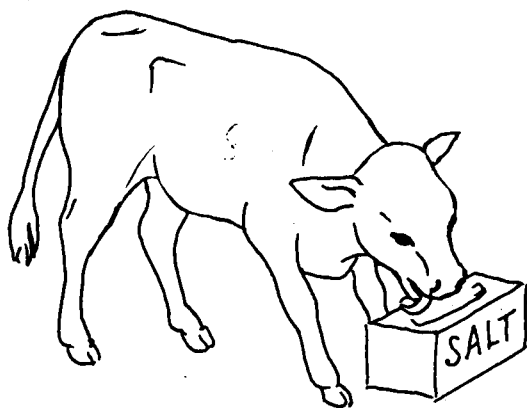


FIGURE 8. Provide salt where calves can get it whenever they want it.

Daily Feeding Schedule

Table 1 is a guide for feeding from birth to 12 months when skim milk is available. The feeding program should be based on the health and appetite of your calf. Several other feeding methods may be used, including calf meals and grains, as discussed on page 8.

Have fresh, clean water available at all times.

Normal Growth of Dairy Cattle

Check your calf for normal growth, using table 2. Every calf will not be the same weight and height. Use table 2 only as a guide.

You can estimate the weight of your dairy heifer by measuring heart girth—around the body just back of the shoulders.

Use table 3 to estimate weight of female dairy cattle by heart-girth measurements. For example, a calf that measures 45 inches in heart girth is expected to weigh about 294 pounds. Use an accurate measuring tape. Have your animal standing straight; and pull the tape snug.

TABLE 2. NORMAL GROWTH OF DAIRY HEIFERS

Age in months	Ayrshires		Guernseys		Holsteins		Jerseys	
	Weight	Height at withers	Weight	Height at withers	Weight	Height at withers	Weight	Height at withers
	<i>Pounds</i>	<i>Inches</i>	<i>Pounds</i>	<i>Inches</i>	<i>Pounds</i>	<i>Inches</i>	<i>Pounds</i>	<i>Inches</i>
Birth	72	27.6	65	26.6	90	29.1	53	25.7
1	89	28.6	77	28.2	112	30.6	67	27.0
2	119	30.2	102	29.8	148	32.3	90	28.9
3	158	31.9	133	31.6	193	34.3	121	30.6
4	198	34.0	173	33.5	243	36.2	158	32.6
5	245	35.5	216	35.3	297	37.7	199	34.5
6	293	37.2	260	36.9	355	39.7	243	36.2
7	344	38.5	305	38.4	410	41.1	286	37.7
8	389	39.9	350	39.9	462	42.3	324	39.0
9	433	40.9	389	40.9	509	43.5	360	40.1
10	469	41.7	427	41.7	552	44.4	393	40.9
11	502	42.5	459	42.6	593	45.3	420	41.7
12	538	43.2	490	43.3	632	46.0	450	42.2
14	611	44.8	556	44.6	705	47.3	507	43.3
16	669	45.7	605	45.3	782	48.5	558	44.4
18	725	46.5	663	46.4	845	49.3	601	45.2
20	793	47.4	712	47.0	912	50.2	642	45.9
24	902	48.3	818	48.0	1,069	51.7	733	46.9

TABLE 3. ESTIMATING THE WEIGHTS OF DAIRY COWS AND CALVES FROM HEART-GIRTH MEASUREMENTS*

Heart girth	Weight	Heart girth	Weight	Heart girth	Weight	Heart girth	Weight
<i>Inches</i>	<i>Pounds</i>	<i>Inches</i>	<i>Pounds</i>	<i>Inches</i>	<i>Pounds</i>	<i>Inches</i>	<i>Pounds</i>
26	80	43	257	60	637	77	1,285
27	84	44	275	61	668	78	1,331
28	89	45	294	62	700	79	1,377
29	95	46	314	63	732	80	1,423
30	101	47	334	64	766	81	1,469
31	108	48	354	65	800	82	1,515
32	118	49	374	66	835	83	1,561
33	128	50	394	67	871	84	1,607
34	138	51	414	68	908	85	1,653
35	148	52	434	69	947	86	1,699
36	158	53	456	70	987	87	1,745
37	168	54	478	71	1,027	88	1,791
38	180	55	501	72	1,069	89	1,837
39	192	56	526	73	1,111	90	1,883
40	208	57	552	74	1,153	91	1,929
41	224	58	579	75	1,197	92	1,975
42	240	59	607	76	1,241		

* USDA Bureau of Animal Industry circular.

Care and Management

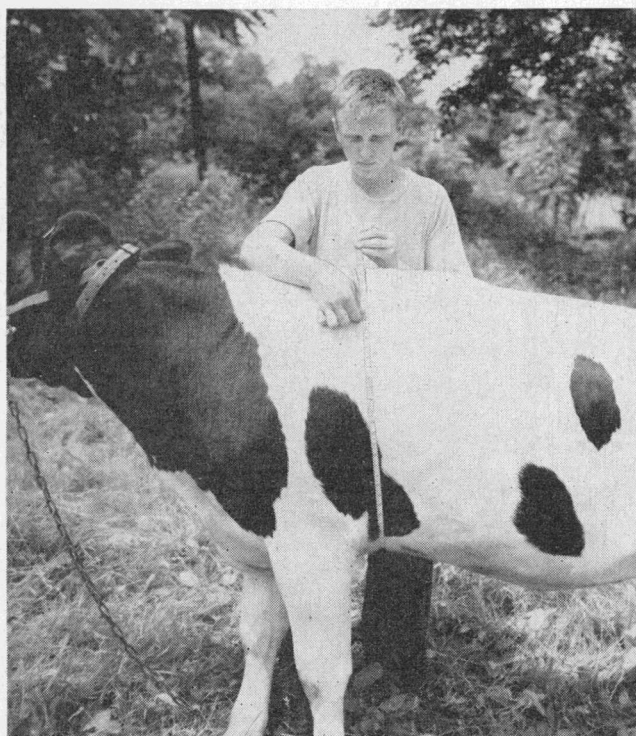


FIGURE 9. Measuring heart girth to estimate weight of animal.

Sanitation helps prevent diseases. Keep feed buckets and mangers clean. Clean pens regularly. Keep them well bedded and as dry as possible.

Protect small calves from drafts and wide changes in temperature. When you change feed, make the change gradually. When you start feeding roughages, remember—a calf's capacity for forage is quite small the first 5 or 6 months. Between 6 and 12 months, the size of the rumen, or stomach, grows more rapidly. At 12 months your heifer will eat larger amounts of roughage and grow normally on good-quality roughage with very little grain.

Young animals need exercise and sunshine. Open sheds or small individual pens may be used. Keep pens well bedded and protected from drafts and prevailing winds. A properly constructed shed, open on one side

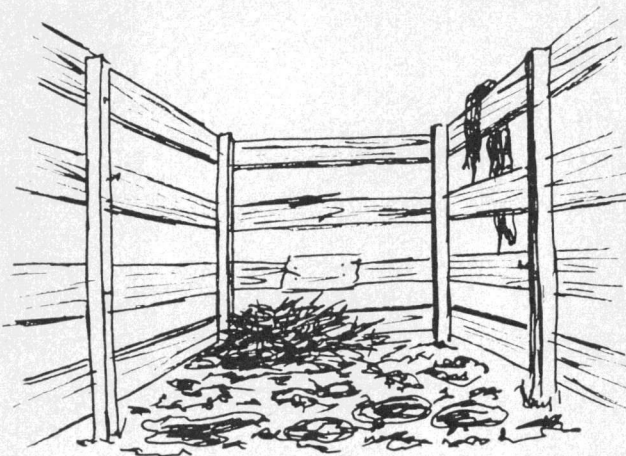


FIGURE 10. Dirty pens invite sickness and flies.

with mangers and racks for feed, is suitable for raising calves and growing heifers—even during winter months.

Dehorning

There is no good reason for horns on cattle, but many reasons for removing horns. Horns injure both cattle and people. These injuries cause losses of meat or milk amounting to thousands of dollars—many times the cost of removing horns or preventing their growth.

Best practice is to prevent horn growth. Use an electric dehorner, or caustic paste. Best time to dehorn a calf is during the first

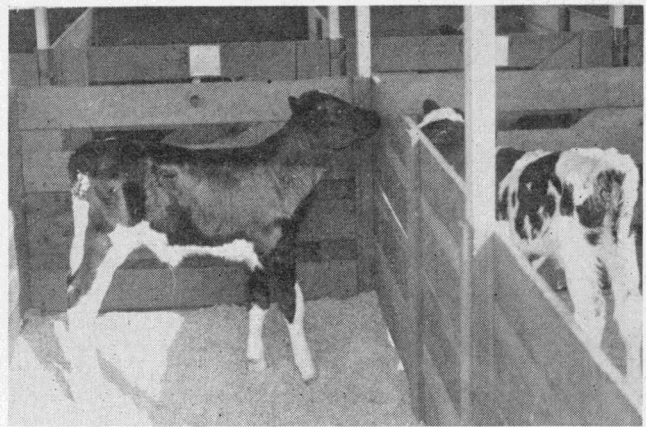


FIGURE 12. Clean, sunny pens keep calves healthy and strong.

few days after birth and after the horn buttons are well defined.

► **ELECTRIC DEHORNING** is quick, easy, and safe, and leaves no open wounds. A calf seldom loses its appetite, and there is no loss of blood or chance of infection.

Preheat the dehorner for at least 10 minutes. Have a firm steady hold on calf. Apply the hot dehorner to a horn button for length of time recommended by the manufacturer, usually 15 to 20 seconds. Keep full burning surface of the heated element in contact with calf's head the full time. A good job will leave a complete burned circle around horn base.

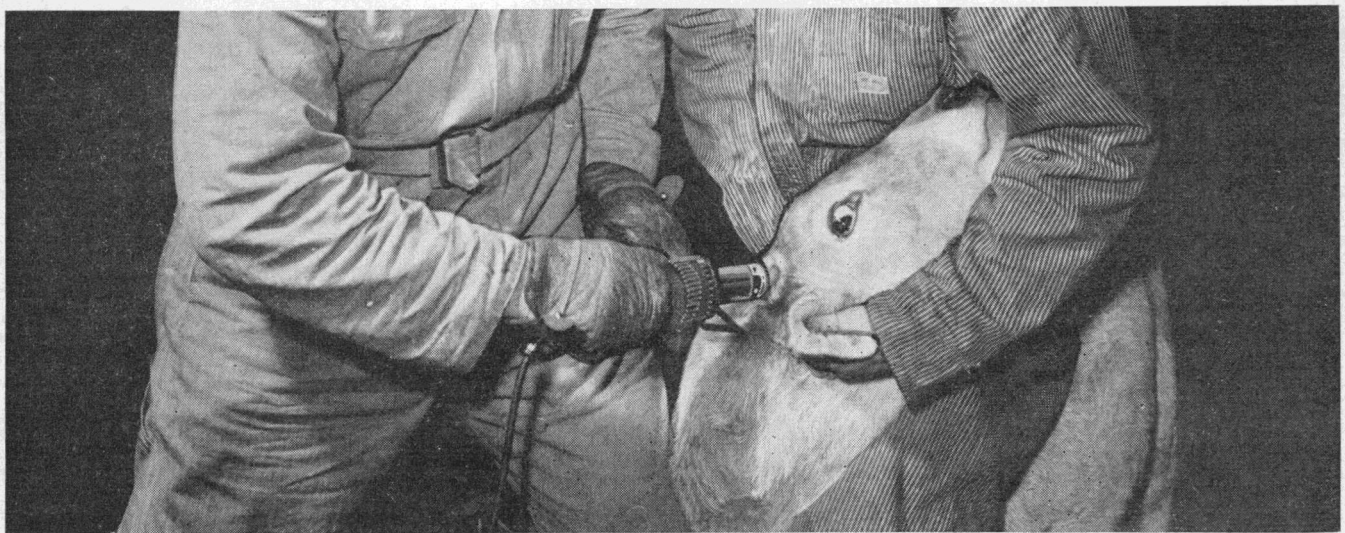


FIGURE 11. Applying an electric dehorner. Have help to hold the calf.

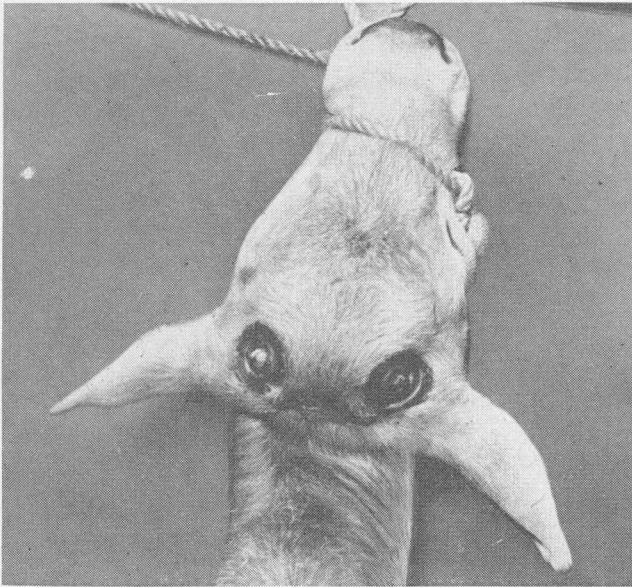


FIGURE 13. Appearance of horns after electric dehorning job is completed.

USE CAUSTIC MATERIALS WITH CAUTION. They can burn your hands, or get into the calf's eyes and cause blindness. Caustic potash (potassium hydroxide) sticks can be purchased from most drug or farm supply stores. Keep caustic sticks in a tightly corked bottle when not in use. Wrap sticks with paper or use pliers to avoid burning your hands.

Before using caustic, clip hair growing over the horn button. Smear a little vaseline around outer edges of the clipped area. It keeps the caustic from spreading farther than you want. Rub the horn button until the skin reddens.

Caustic paste is used in the same manner. Use the same care in handling.

As with electric dehorning, hold calf firmly during application of the caustic. Tie the calf by itself, and out of reach of other calves after the job is done. Keep the calf in a pen away from rain and snow, so the caustic will not wash into its eyes.

Removing Extra Teats

Extra teats on an udder are unnecessary, unsightly, and often interfere with milking.

Remove extra teats when the heifer is small and easy to handle. The operation is simple and there is little discomfort when the animal is small. There is seldom any bleeding when properly done.

Simply tie or hold the calf securely, and apply tincture of iodine to the teat to be removed. Clip it with clean, sharp scissors. Now—paint the cut with iodine. Watch the cut for proper healing.

Marking for Identification

Identify each calf in a dairy herd shortly after birth. Numbers tattooed in ears give permanent identification. Some breed associations require tattooing for registration of solid-colored animals. You can also identify animals by eartagging, photographing, or sketching the color markings.

Record your calf's identification in your record book. Also the registration number of the calf's sire, the eartag number or registration number of its dam, and the calf's birth-date. Acceptable eartags for identification are DHIA or Bang's disease test tags, which are not duplicated in any other herd.

Record Keeping is Important

Your 4-H record book is a required part of your dairy project.

Good records will help you have a successful dairy enterprise. When something interesting happens, write the story in your 4-H record book.

Record all expenses and income when they happen, or at least once a month. Be sure your record book is brought up to date at the end of each month.

Keep accurate and complete records of feed fed and milk produced. They help you learn how much it costs to raise your calf, and show profit or loss on your producing cow. Records kept for several years will be a good story of your progress with the dairy project and other 4-H Club activities.

- Here are two ways to keep feed records:
- If you buy feed separately or keep it in your own feed box, you can enter it in the



FIGURE 14. Tattoo mark (left) and eartag (right) identify calves.

record book each time you buy feed or fill your feed box;

- You can keep a record of the feed fed each day, and enter it in your record book at the end of the month.

When your heifer is ready to breed, get a "4-H Dairy Production Record Card" (figure 17) from your 4-H Club leader or County 4-H Extension Agent. On this card, record the calves, milk, and fat produced by your cow. Use a separate card for each cow.

Your Yearling Heifer

Feed your dairy heifer to keep her healthy and growing normally. The period from one year to time of freshening is the easiest and cheapest period. It is, however, a very important period. Your heifer should not be neglected. Keep her thrifty and growing—not stunted and not too fat. A well-grown-out heifer can be bred to freshen at a younger age than a stunted animal.

Winter Feeding

When you feed plenty of good hay, or good hay and silage, growing heifers will develop large barrel capacity. If your heifer is well developed in her first year, she will continue to grow on good-quality alfalfa, clover, or oat and vetch hay alone, or with a minimum of grain. If your heifer eats $2\frac{1}{2}$ to 3 pounds of good-quality hay daily for each 100 pounds of body weight, she needs no other feed for normal growth. Silage, kale, or root crops may take the place of part of the hay. Three pounds of silage replaces one pound of hay.

If your hay and other roughage is of poor quality, feed your heifer 1 to 3 pounds of grain mix daily. This will furnish nutrients needed for normal growth. Oats or mixed farm grains are satisfactory with legume or mixed hay. If you have only grass or grain

hay, add 10 to 15 pounds of linseed oil meal to each 100 pounds of grain mixture. The amount of grain needed depends on quality and amount of roughage eaten. Feed only enough for good body growth and moderate fleshing.

When silage or roots make up a large portion of the roughage, you may need to feed as much as 3 pounds of grain daily for good growth. A good supply of clean, fresh drinking water, salt, and sterilized bonemeal should be available at all times.

Summer Feeding

Good pasture will furnish all the protein and energy your yearling heifer needs. Good



FIGURE 15. A successful dairy project needs plenty of good forage.



FIGURE 16. Prepare for calving several weeks ahead.

irrigated pasture will provide plenty of feed all summer if not grazed too short. If your pasture cannot be irrigated (dryland pasture), watch your heifer's condition. You may need to feed grain or hay while on pasture. If your heifer gets thin, she may not be getting enough feed from pasture. It is not profitable to stunt an animal's growth. More feed is needed to develop a stunted animal than to produce normal growth from the start. Four pounds of fresh cut or green chop grasses and legumes are equal to one pound of hay.

Keep Your Heifer Growing

To keep your heifer growing, compare her growth with the "Weight and Growth Chart," page 11.

When to Breed Your Heifer

Heifers should be bred between 15 and 20 months, depending on animals' breed and growth. Breed Holstein and Brown Swiss heifers at 18 to 20 months; other breeds at 15 to 17 months. Average "gestation period"

(see Cow Talk, page 29) is 282 days. It may vary as much as 10 days. Plan to have your heifer freshen between 24 and 29 months of age. If she is small for her age, delay breeding a few months. Heifers large for their age may be bred 1 or 2 months earlier than the average.

The following weights and measurements of dairy heifers are recommended for breeding.

Breed	Weight	Heart girth	Age
	<i>Pounds</i>	<i>Inches</i>	<i>Months</i>
Jersey	550	57	13 to 16
Guernsey	600	59	14 to 17
Ayrshire	675	61	14 to 17
Holstein	825	66	14 to 17
Brown Swiss	Approximately the same as for Holsteins.		

Prepare for Calving

Three months before your heifer is due to calve, give her extra feed so she will be in good condition for freshening. Start feeding more grain and gradually increase the amount fed daily to about 6 to 8 pounds, depending on your heifer's condition.

To make a good 100-pound grain mixture for growing heifers, use:

33 pounds oats
33 pounds barley
33 pounds wheat bran
2 pounds salt
2 pounds sterilized bonemeal

or

50 pounds oats
25 pounds barley
25 pounds wheat bran
2 pounds salt
2 pounds sterilized bonemeal

Oats and barley should be rolled or coarsely ground.

One month before freshening, add 10 pounds of linseed oil meal to each 100 pounds of grain. Well-conditioned heifers have a better chance to be profitable producers. A high-

producing cow cannot eat enough feed for her requirements for a short time after she freshens. She must make up the difference from her body reserves.

One week before the heifer is due to freshen, reduce the grain allowance to 3 or 4 pounds daily. Put her in a clean, dry, well-bedded pen.

Care and Management of the Producing Cow

Care at Calving Time

Immediately following birth of your calf, paint its navel cord with tincture of iodine. The cow will usually dry off the calf. Within a few hours after your cow freshens, give her slightly warmed water. The calf should stand and nurse within 5 hours after birth.

Allow your calf to nurse the cow during the first 48 hours. Then remove the calf from its mother.

If your cow is doing nicely, milk her for the first time 10 to 12 hours after she freshens. Milk only about half the milk from each quarter. For the next 2 days milk out a little more each time. By the fourth day, milk your cow completely at each milking.

Feeding the Milking Cow

Feed plenty of hay all the time, including the day of calving. If you are feeding silage, kale, or other green feed, reduce the amount about half for the first week after calving. Then gradually increase to full feed. Your cow will do well without any grain the first day, but needs 2 to 4 pounds the second day. As long as there is any swelling in the cow's udder, do not give a full feed of grain. Gradually increase grain as swelling leaves the udder. Go slowly in getting your cow on full feed.

You can get a "Schedule of Grain Feeding" from your County Extension Agent. It is a useful guide for feeding cows. The amount of grain to feed depends on quality of forage available and amount of milk your cow produces.

Here are Suggested Grain Mixtures for Dairy Cows.

To make 100 pounds, use—

47 pounds mill run
50 pounds barley*
1½ pounds bonemeal
1½ pounds iodized salt

Crude protein—12.0%
TDN—72.2%

or

47 pounds barley*
50 pounds oats
1½ pounds bonemeal
1½ pounds iodized salt

Crude protein—9.3%
TDN—72.7%

or

37 pounds mill run
40 pounds barley*
20 pounds beet pulp, molasses
1½ pounds bonemeal
1½ pounds iodized salt

Crude protein—11.5%
TDN—72.2%

* Corn, milo, or wheat can replace all or part of barley pound for pound if "TDN" (See Cow Talk, page 29) cost is less.

General Care and Management

The object in feeding a dairy cow is more than just to give her something to eat. Proper feeding provides nutrients needed for health and vigor, so the cow can produce milk in amounts equal to her inherited ability.

Your milking cow needs free access to clean, fresh water and salt. She needs all the good-quality roughage she wants. Protect her from bad weather, keep her dry, comfortable, and well bedded. A clean, healthy cow produces clean, high-quality milk.

Be regular with your feeding and milking chores. In milk production it pays to be quiet

and gentle around cows. Avoid sudden feed changes.

Plan to have your cow freshen every 12 months. She should milk well for approximately 305 days each lactation. Wait at least 50 to 60 days after calving to breed your cow for the next year. Let your cow have a 6-to-8-week dry period to build up her body reserves for calving and her next lactation. To dry her off, simply quit milking. Stop feeding grain. For the next week reduce her hay and silage by half, with no grain. Her udder will fill and the milk will gradually be reabsorbed. Start feeding grain again when her udder is in good dry condition. Feed your cow well during the dry period, so she can produce well when she freshens again.

Dairy Herd Management and Improvement

After several years' experience with 4-H dairy projects, you may own several animals, and have herd management problems.

With several animals you must plan a feeding program for the entire year. A 4-H crops project to produce grain and forage works in well with any livestock project.

Plan to have enough feed of highest quality at the lowest possible cost. Good pastures will furnish 75% or more of the necessary feed for about 6 months of the year. Fertilization, irrigation, and other recommended pasture management practices will help you get the most feed from your land. Harvest extra pasture growth for silage. Storing roughage as silage will save the most feed nutrients, especially when weather conditions are unfavorable for making good hay. Harvest and store hay so it will keep as much green color and leaves as possible. Other succulent feeds such as corn silage, kale, or root crops may be grown wherever profitable. Use homegrown grains when possible.

Production Records

Weigh and record milk weights regularly. Have milk tested for fat at least once a month. Then feed grain according to production. You can keep satisfactory production records by weighing and testing a 24-hour sample (two consecutive milkings) once a month. Milk and butterfat for the month are figured on a 24-hour production basis.

Keep accurate records to figure profit or loss. Record the amount of grain fed daily, and any changes in feed. You can then determine total feed costs for the month, for the lactation (See Cow Talk, page 29), or for the year. Record breeding and calving dates.

Every successful business man keeps accurate and complete records.

Selecting a Herd Sire

If your family is not following a particular line of breeding for the home herd, consider using artificial breeding. A herd sire contributes as much toward this future herd as all the cows to which he is mated. It is important that your sire be able to increase the production of his daughters above that of their dams. He should also transmit good type. You can get more information on artificial breeding from your County Extension Agent.

Other Management Practices

Protect your animals from injury and exposure to contagious diseases such as brucellosis (Bang's disease), tuberculosis, and mastitis.

Proper, careful, and regular milking will help your cows produce more milk for a longer time. These practices help you produce high-quality milk.

Practice sanitation in all phases of management. Start with the newborn calf or

Owner-Sampler Cow Record

DHI 2
EXT-DHI-3-50-10M

Name ALICE MARIE LASS No. 202843 Birth Date 9-12-47 Sire 72287

DATE TEST STARTED 1954	DAYS IN MILK	MILK PRODUCED		AVE. TEST %	BUTTER FAT	DATE TEST STARTED 1955	DAYS IN MILK	MILK PRODUCED		AVE. TEST %	BUTTER FAT
		DAILY	MONTHLY					DAILY	MONTHLY		
PROD. TO DATE	270		7865		271	PROD. TO DATE	293		9015		299
3/1 TO 3/31	31	20.4	632	3.5	23	3/1 TO 3/31	31	20.6	640	3.3	21
4/1 TO 4/30	-	Dry on April 1				4/1 TO 4/30	13	270			9
TOTAL TO DATE	301		8497		294	TOTAL TO DATE	337		9925		329
5/1 TO 5/31	20	44.7	895	3.8	34	5/1 TO 5/31	-	dry			
6/1 TO 6/30	30	42.5	1275	3.2	41	6/1 TO 6/30	26	48.5	1270	3.9	50
TOTAL TO DATE	50		2170		75	TOTAL TO DATE	26		1270		50
7/1 TO 7/31	31	34.9	1085	3.2	35	7/1 TO 7/31	31	50.0	1550	4.0	62
8/1 TO 8/31	31	32.9	1020	3.3	34	8/1 TO 8/31					
TOTAL TO DATE	112		4275		144	TOTAL TO DATE					
9/1 TO 9/30	30	27.2	810	3.4	28	TO					
10/1 TO 10/31	31	26.9	840	3.8	32	TO					
TOTAL TO DATE	173		5925		204	TOTAL TO DATE					
11/1 TO 11/30	30	26.0	800	2.7	22	TO					
12/1 TO 12/31	31	26.3	830	3.1	26	TO					
TOTAL TO DATE	234		7555		252	TOTAL TO DATE					
1/1 TO 1/31	31	25.3	790	3.0	24	TO					
2/1 TO 2/28	28	24.0	670	3.4	23	TO					
TOTAL FOR YEAR	324		9647	3.33	322	TOTAL FOR YEAR					

Oregon 4-H Club—Dairy Cow or Goat Production Record

Name of cow or doe Sybil Sultan Peggy Ann Ear Tag or Reg. No. 1653257
Breed Jersey Birth Date 3-19-47
Sire #426353 Dam #1397184

CALF OR KID RECORD					MILK & BUTTERFAT RECORD				
Date	Sex	Name of Calf or Kid	Name of Sire	Age of cow or doe*	Days Milked		Pounds Milk	Pounds Fat	% Fat
					Years	Months			
3-15-52	M	Tattoo - P-106	#482286	5	-		349	10505	563 5.4
5-3-53	M	Tattoo - P-121	#482286	6	1		359	10017	529 5.3
6-24-54	F	Tattoo - M-21	#536961	7	3		232	7933	468 5.8
4-29-55	F	Tattoo - M-34		8	1				

* Age of cow or doe at beginning of lactation (milking) period.

Remarks:

FIGURE 17. Sample production record cards.

yearling heifer, and continue on through the productive life of your cow. Milking methods and care of milk also require sanitation. Good practices prevent infestations of insects and parasites. Keep pens and stables clean and well bedded. Clean feed boxes and water troughs are important. Milk-feeding pails should be scrubbed clean and sterilized after each use. Keep your barn lots and corrals free from old boards, nails, and wire. Keep excess mud and manure from accumulating in barn lots.

Dairy Herd Improvement Associations

A Dairy Herd Improvement Association (DHIA) is a local, cooperative, nonprofit organization of dairymen interested in keeping production records on their herds in cooperation with the State Extension Service represented by your local County Extension Agent and the U. S. Department of Agriculture.

The USDA furnishes uniform record sheets for Standard DHIA testing in every state. The dairyman gets the production records and testing service. The State Colleges and the USDA use the records for education, research, sire proving, and selection of outstanding cow families. Rules and regulations for testing are uniform in all states. The State Extension Service helps locate and train test supervisors, and supervises their work. The local association hires the test supervisor, furnishes the equipment, and manages association affairs through its board of directors. Most local associations will test your 4-H Club project animals and assist with your records.

Production records will guide you in feeding cows, selecting herd replacements, culling low producers, and planning an improved herd breeding and management program. The proving of sires, an important function of the dairy herd improvement program, requires production records.

Official Testing

Official testing is available for registered cattle. Some breed associations have special rates for 4-H Club members who wish to put their cows on "official test." Testing is supervised by the State Agricultural College at owner's expense. Apply to the breed association and to the Superintendent of Official Testing at the State College.

Testing Opportunities

A dairy herd improvement test supervisor job offers excellent opportunity for an older 4-H Club boy who wants some practical experience. This work can be done by anyone interested in dairy cattle and capable of doing good work with testing, figures, and records. Visiting some 25 dairy farms once a month for a year or two provides a lot of valuable ideas. Your County Extension Agent can help you learn more about this work.

Type Classification

Classification of dairy herds is designed to improve breed type. All females that have calved and males over 2 years of age, in some breeds in registered herds, are scored according to type by an experienced person appointed by the breed association. Purebred owners apply for herd classification through the individual breed associations.

Names and addresses of the various dairy cattle breed registry associations are listed below:

The Ayrshire Breeders Association,
Brandon, Vermont

The Brown Swiss Cattle Breeders' Association,
Beloit, Wisconsin

The American Guernsey Cattle Club,
Peterborough, New Hampshire

The Holstein-Friesian Association of America,
Brattleboro, Vermont

The American Jersey Cattle Club,
Columbus, Ohio

The American Milking Shorthorn Society, Springfield, Missouri

Junior memberships are available to 4-H Club members in most dairy cattle breed associations.

How to Register Your Calf

Write to the breed association for regis-

tration and transfer application blanks. Your local club leader or County Extension Agent will help fill them out. Transfer a purchased animal to your name. Newborn calves should be registered promptly, to avoid errors and save charges.

Read instructions on the application. Carefully fill it out and sign with ink.

Fitting and Showing Dairy Cattle

The main object of a dairy project is to learn to manage and develop profitable dairy animals. You will learn proper selection, care, and feeding. The animal you raise may or may not be a winner in the show ring. When you begin your project, select your calf—first, on the basis of production—and then, on the basis of breed type. Your feeding and management program will determine your animal's growth and development.

Animals chosen for the show ring should have most of the desirable type characteristics for dairy cattle.

Leading

First teach your animal to lead. An animal you can lead is valuable, even though you never show it. Tie your calf with a halter for several days before starting to lead.

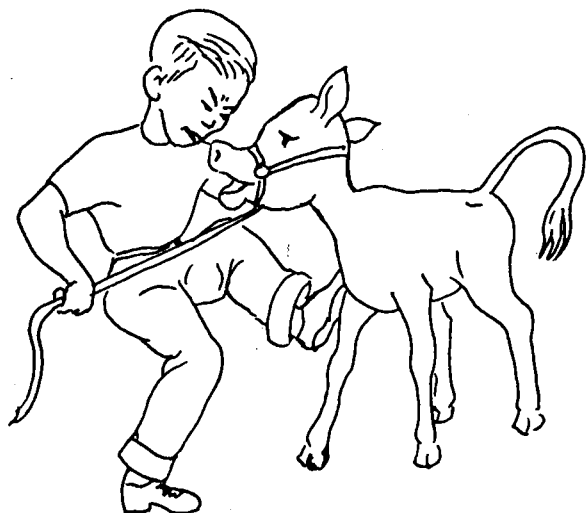


FIGURE 18. Never strike or kick your calf.

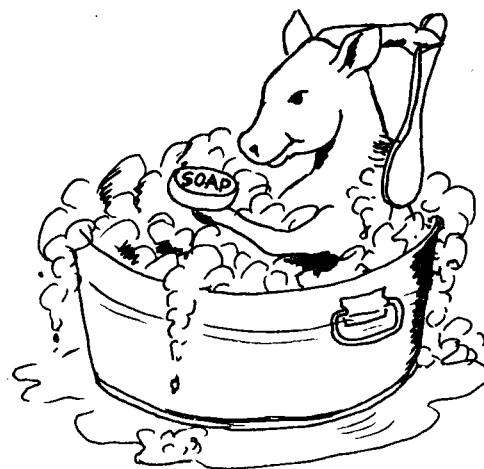


FIGURE 19. The first bath should be thorough.

Teach your calf to follow with a gentle pull on the rope. Never strike or drag it. That is a sure way to develop stubbornness. Teach your animal to stand squarely on all four feet with its head up and back straight. Move slowly when leading. Your calf will be more likely to behave in similar manner in the show ring.

Feeding

Continue the regular feeding schedule when you prepare your calf to show. About 6 weeks before the fair, add 10 pounds of linseed oil meal to each 100 pounds of grain mix. Oil meal helps condition hair and skin. Feed older animals extra grain, if needed, in addition to oil meal. Your heifer should be in a thrifty condition but not fat. Better have it a trifle thin than too fat.

Grooming

Brush your animal at least once every day with a soft brush. Then rub it firmly with the palms of your hands using downward strokes. This helps remove the long hair and makes a glossy coat. Use metal curry combs only to remove caked dirt from the legs, flanks, or underline. Use care with metal combs. Curry combs often scratch.

About 6 weeks before the show, give your animal a bath with warm water and soap. Usually a good bath at the start of the fitting period is all that is needed. An animal with lots of white color may need to be washed more frequently. Too much washing removes the natural oil from the skin and hair coat. Wash animal only on warm days or in a warm place.

Blanketing

Start using a blanket on your animal 6 weeks to 2 months before the show. The blanket should cover your animal from the front of the shoulders to the rear of the tail setting. It should be wide enough to hang about 4 inches below the underline.

When the hair is extra long, use a double blanket. A piece of cotton blanketing under a burlap or canvas blanket does very well. Heavy blanketing causes quicker shedding of hair and softens the hide faster. Use the diagram shown in figure 20 to make your own calf or cow blanket. Burlap or even gunny sacks may be sewed together to make good blankets for home use. Even though you have some good purchased blankets, use the burlap blankets at home. Keep your better blankets clean to use at the fair.

Making a Calf Blanket

You can make a good serviceable calf or cow blanket from gunny sacks, burlap material, or lightweight (8 ounce) duck material. Line the burlap with an old cotton blanket. Your mother may have one that is

nearly worn out. If cotton blanket material is not handy, use the burlap double thickness. Burlap is cheap and makes a good blanket for animals.

Sew patches of denim about 6 inches square for reinforcement at the front and back of the blanket as pictured in figure 20. Straps for fastening the blanket are sewed on at these spots. The two side patches should be 6 inches by 12 inches.

Strap 1 is attached in front and slightly below the point of the shoulder. Use one 12-inch strap on each side of the blanket at the front.

Strap 2 goes around the animal outside the blanket over the back, and through an eyelet, as shown. This leaves the lower edges of the blanket free.

Strap 3 should be long enough to go under the leg and loose enough so it will not rub or irritate the skin. Have straps long enough to tie easily.

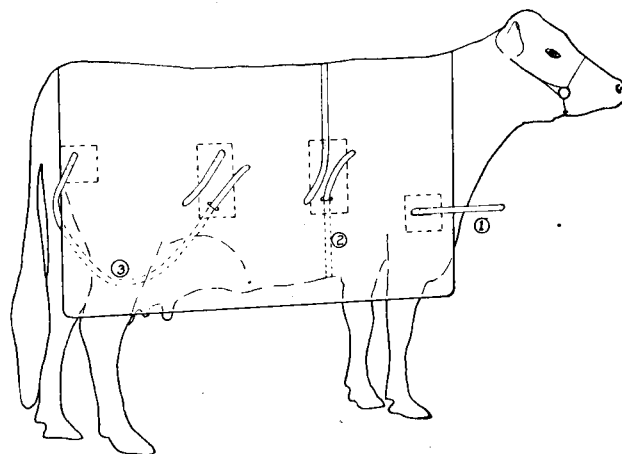


FIGURE 20. Pattern for home-made cow blanket.

Horns

Horns are dangerous to you and to other animals. They require extra work for show cattle. They must be shaped and polished. Take care not to scrape them or file them too deep. Polish with pumice stone, metal polish, or silver polish. Apply as an oil paste. Use a flannel cloth.

Feet

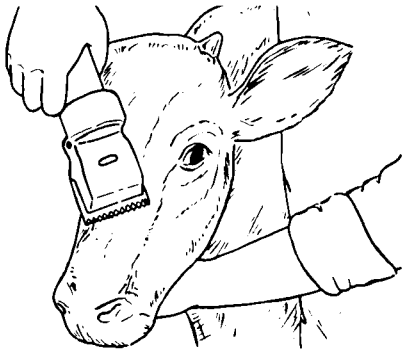
Feet may need to be trimmed. If the toes are long, crooked, or uneven, your animal cannot stand or walk naturally. Use a pruning shear, hoof nipper, sharp knife or chisel, and a rasp. Trim toes from the under side, just short enough to let your animal stand straight on her legs. Clean and polish the hooves just before going into the ring.

It's a good practice to keep your animal's feet trimmed whenever necessary. It helps prevent lameness and foot diseases.

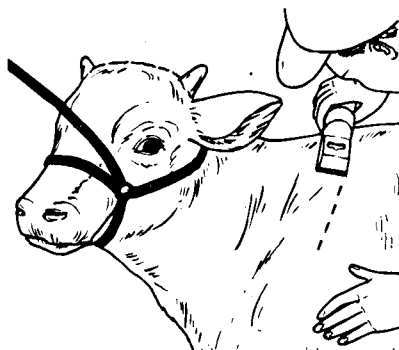
Clipping

Do not clip your animal all over. The only exception is an animal that just won't shed its long hair. If this condition still exists one month before fair time, after you have groomed and blanketed your calf, then you could clip the animal all over. This much time will allow the hair to grow out and get some gloss and shine to it, and will provide a winter coat for your animal.

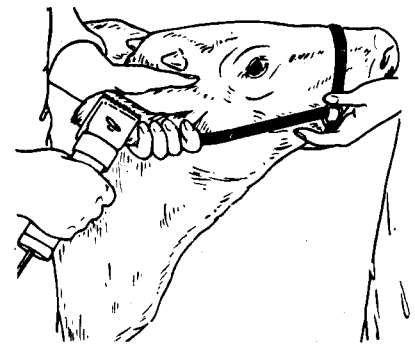
Clipping all over makes the rough spots on your animal more noticeable, and the hair



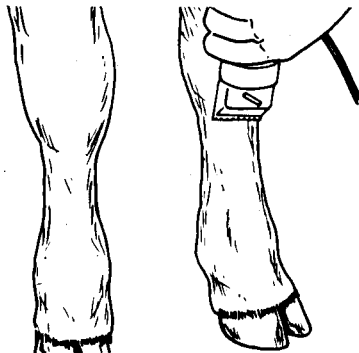
Clip entire head to bring out character, expression, and clean lines.



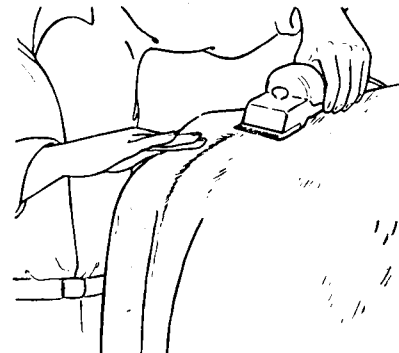
Clip neck and shoulders to a line between top of shoulders and point of the shoulders.



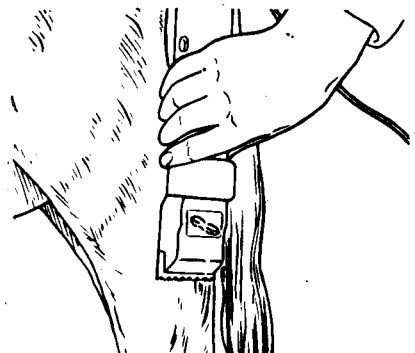
Trim hair from inside and outside of ears. On Brown Swiss, a fringe may be left inside ears.



Remove long hair from above knees to hooves to show refinement.

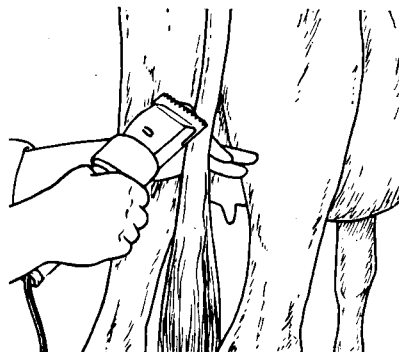


Smooth top line of rump. Leave hair in low spots. Blend by clipping with lay of hair.

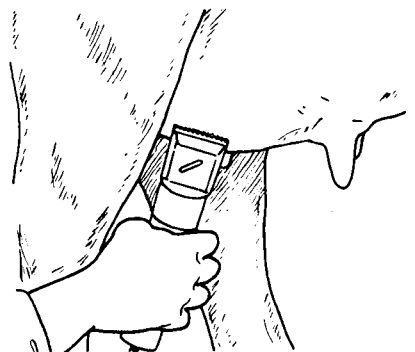


Clip hocks and hind legs to show refinement, to straighten legs, and to define tendons.

FIGURE 21. Clip with lay of hair to blend clipped and unclipped areas. Do not clip animal all over, except if it won't shed its long hair. If you must, clip one month before fair time. This will allow hair to grow out, and provide a winter coat for your animal.



Clip tail from switch to rump against lay of hair.



Clip long hair off udder.

loses its bloom and shine. Long hair left on the underline of calves and heifers makes them look deeper bodied.

Clip the head and neck as far back as the withers and down to the point of the shoulder. Clip the tail from the tail setting down to within an inch of the top long hairs in the switch. Clip the udder and belly on mature animals. Except as mentioned above, clipping should be done within a week of show time. Then the day before showing you can clip the head and ears again if needed.

Brown Swiss breeders prefer to leave the long hair in the upper inside part of the ears. Use scissors to complete the trimming around horns and ears.

Milking Shorthorn cattle are not clipped on the head and neck. The only clipping necessary is the coarse hair inside the ears, on the tail, and on the udder of producing cows.

Final Show Preparations

The night before showing, wash the ears and switch. Braid the switch on older animals into several small braids. Comb out the braids and fluff the tail just before entering the show ring.

Give your animal a liberal feed of good hay the morning of show day. Take the chill off drinking water. Too much cold water just before showing may cause the animal to



FIGURE 23. Be a good sportsman—win or lose.

hump its back, start shivering, or cause the hair to stand on end. It's difficult to show an animal in such condition.

Be sure your animal is absolutely clean before leading into the show ring. Use a clean halter, properly adjusted to the animal. YOU should be neat and clean, too.

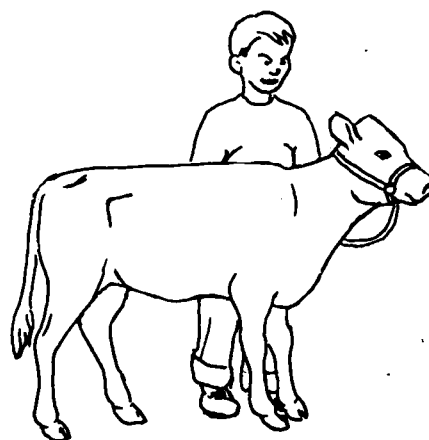
Be ready when your class is called.

Showmanship

Enter the arena promptly. Move animal in a circle in a clockwise direction. Fold the lead strap neatly in 1 hand about 6 inches from the halter. Watch closely and always



FIGURE 22. A good showman is always alert, keeps his animal showing at its best, and never leans on his calf.



keep your animal under control. Keep it between you and the judge. Lead so you can watch both your animal and the judge. Always be ready to follow instructions.

Never jerk or strike an animal. Your animal may be backed a few steps. If necessary, lead forward and circle around into position.

Be alert. Keep your animal showing to the best advantage all the time, even though the judge may be working across the ring or looking at other animals. Keep animal on display, head held high, alert, feet squarely placed, and back straight.

Remember, you are showing your animal from the time you leave the barn until you return. A good showman is always neat and clean.

If the animal you are leading is nervous, difficult to control, or disturbing other animals, keep some distance away from other leaders and animals. Your consideration for others may rate you nearer the top of the class. It will also prevent disturbances and interruptions.

Showmanship Contests

The purpose of livestock showmanship contests is to help boys and girls learn courtesy, good grooming, poise, and confidence. You will also learn how to train, properly fit, and show your animal.

Breed type and body conformation will not be considered in a showmanship contest. The "Showmanship Score Card" lists points the judges look for in showmanship.

All training and fitting of animal, both before and during the fair, is to be done by you.

Clipping the entire body of a dairy animal is objectionable.

Always lead from the left side, with the lead strap attached at the left side of the halter. Either rope or leather show halters are acceptable. Cleanliness and condition of the halter will be considered. The halter

should also be properly adjusted for size to fit the animal.

If you observe your own faults and those of others and try to improve, you will gain in showmanship ability.

Know Your Animal

Be ready to answer the judge's questions in the show ring. He may ask you for the following information:

1. Animal's birth date. Give exact DAY, MONTH, and YEAR if possible. Next best, give MONTH and YEAR. These dates should be in your record books.

2. Last freshening date for producing cows.

3. Next freshening date.

4. Breeding date.

How well you know your animal indicates how much care you give it.

Oregon 4-H Livestock Showmanship Score Card

Appearance of the Animal	40
Condition	10
Grooming	10
Clipping	10
Cleanliness	10
The Exhibitor	10
Neatness and appearance	10
Showing the Animal	50
Leading	15
Posing	15
Showing to advantage	10
Control of animal	10
TOTAL SCORE	100

Herdsmanship

Good herdsmanship is knowing how to feed and care for livestock properly—then doing it.

Keep your exhibit attractively displayed all the time. Have a place for feed, for equipment, and for your personal things. Keep each item in its place.

Be regular and prompt with each day's

Steps in Producing

**Produce milk that looks and tastes
good every day.**

Healthy Cows

Clean Barns

Proper Milking Methods

Careful Handling

Sterile Equipment

Keep barn clean.

Discard off-flavor milk.

Wash udders before milking.

Sterilize equipment after use.

Remove milk from barn quickly.

Farmer should be free of contagious diseases.

Use clean, hooded, well-tinned, seamless pails.

Cover cans with clean lids; protect tank openings.

Never sell abnormal milk, or milk from infected cows.

Do not mix warm milk in same cans or tank with cold milk.

Store milk in clean, sterilized, well-tinned cans or tanks.

Store clean, sterile utensils on rack in a ventilated room.

Wash equipment thoroughly. You cannot sterilize unclean equipment.

High-Quality Milk

Keep cows clean.

Store in sterile utensils.

Use a strip cup each time.

Filter through cotton filters.

Keep bulk-tank openings closed.

Wear clean clothes, have clean hands.

Precool milk to add to that in bulk tank.

Cool to 50°. Keep at 40° to 50° until shipped.

Protect cans at roadside and during transportation.

Keep equipment in good repair. Stainless steel is best.

Discard milk 15 days before and 5 days after cow calves.

Keep insects, rodents, birds, and animals out of milkhouse.

Use steam, boiling water, or chlorine to sterilize equipment.

Milk is clean and wholesome when it comes from clean, healthy cows.

Once contaminated, milk can never be restored to its original purity and quality.

**Produce Clean Milk
Keep Milk Clean**

feeding and cleaning. Tie your animals securely so they are comfortable, yet not loose enough to back out into the alley, or to disturb other animals.

Be friendly and helpful toward visitors and other herdsmen. Know your animals and be ready to answer questions about them.

Keep the alleys neat and clean.

Any 4-H livestock herdsmanship contest helps teach you to be courteous, neat and orderly, and to take proper care of your animals.

Herdsmanship Score Card

Animals	30
Securely tied or penned	10
Clean and comfortable	10
Regularly fed and cared for	10
Club Members	40
Neat and clean	10
Friendly, courteous, and cooperative..	10
On the job when needed	10
Work done by 4-H members	10
Barn	30
Alleys and stalls clean and orderly	10
Feed and equipment neatly and safely stored	10
Stall cards neat and complete	10

How Dairy Products Are Marketed

Oregon dairymen produce over a billion pounds of milk a year. This much milk would fill tank cars in a freight train reaching from Portland to Pendleton.

Nearly all dairy farms use milking machines. Milk is cooled soon after it comes from the cows to keep it fresh. Some modern dairy farms have pipeline milking machines. With this equipment milk flows or is pumped directly from cows to bulk holding and cooling tanks without air contact. Milk in cans is hauled every day; milk in bulk tanks, every other day.

Milk hauled in cans is weighed and sampled for fat tests at the plant. Milk collected from farm tanks cannot be weighed there, because milk from several farms is mixed in one large tank truck. The driver measures depth of milk in the tank at each farm to determine its weight, and samples the milk after thorough mixing. Milk weight and temperature are then recorded. Three copies of this record are made. One copy is left with the farmer, one with the marketing organization, and one with the plant buying the milk.

A milk pump, located in a dustproof box on the truck, is connected to the farm tank by a sanitary hose. In a few minutes the milk is pumped into the tank truck, the hose dis-

connected, and the tank rinsed with cold water before the truck leaves the farm. This makes it easier for the farmer to clean his tank.

When the filled tank truck arrives at the plant, the milk is pumped into a large storage tank. The plant operator decides what to do with the milk. Most of it is pasteurized to make it safe for people to drink. To pasteurize, milk is heated to a certain temperature for a number of minutes to kill harmful bacteria that may have found their way into the milk. Some milk will be separated. Skim milk may be used for cottage cheese, and cream for ice cream or butter. Much of the pasteurized milk will be homogenized. Cream does not rise to the top in homogenized milk because the fat has been broken into such small particles by a high pressure pump, that they remain suspended evenly throughout the container. Milk to be sold for drinking is bottled in glass or paper cartons of different sizes.

Bottled milk is then stored in a large cooler room until hauled out for delivery by retail or wholesale truck drivers. Retail routes deliver milk to homes. Wholesale trucks deliver milk to stores and restaurants. Salesmen call on stores and homes to help sell more milk and dairy products.

Most home deliveries are made every other day, some only three times a week. Trucks also deliver butter, cheese, ice cream, cottage cheese, etc. Ice and refrigerated compartments keep dairy products cold during warm weather.

Wholesale trucks delivering to stores and restaurants are larger, carry more products, make fewer stops, and deliver more each stop than do retail trucks. Most restaurants get milk in large cans. Some is used in the kitchen for preparing meals. Some is delivered in dispenser cans that fit into the shiny boxes where the waitress draws a glass of milk when you ask for milk with your meal.

Most stores take milk deliveries in paper

cartons. A date is stamped on their cartons so the customer will always get fresh milk. Wholesale truck drivers put the milk in the refrigerators, and arrange it so it will be sold in dated order. Butter, cheese, ice cream and cottage cheese products are usually delivered to stores by special trucks so that milk truck drivers handle only milk on wholesale routes.

About half the milk produced in Oregon is used for fluid milk markets, for the bottle and can trade. A few years ago considerable milk was separated on the farm and cream sold to the creamery. Today most farmers sell whole milk for bottled milk, cheese, evaporated or dried milk, and even to butter plants.

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, so small they can be seen only with a microscope. Germs are bacteria. Some bacteria are good—others are not.

Bang's disease (brucellosis)—A disease causing animals to lose their unborn young before they are due.

Breed—The kind or variety of dairy animal: Jersey, Holstein, Guernsey, etc.

Breed—To mate a cow with a bull.

Calve—To give birth to a calf. To freshen.

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.

Caustic—A strong chemical material that eats away or destroys living tissue. Potassium hydroxide is a caustic used to dehorn calves.

Chlorine solution—A chemical solution containing chlorine used in sterilizing milk pails, cans, and other utensils to kill bacteria. Not used for cleaning.

Clockwise direction—To move in a circle in the same direction that the hands of a clock move.

Colostrum—(ko-los'trum)—The milk given the first few days after birth of young.

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

Condition—Describes health and fleshing of animals: *good condition* or *poor condition*.

Conformation—The build or shape of an animal.

Contagious disease (infectious)—A disease that is catching. A disease that is spread from one animal to another by contact, or from just living in the same herd or buildings.

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

Crude protein—Refers to all the proteins in feed materials, digestible or not.

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

Dam—A female parent; mother.

Daughter-dam comparison—Production of a cow compared to her mother's production. Used in rating the ability of a bull to transmit production to his offspring.

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

Dryland pasture—Pasture grown on land that is not irrigated.

Eartag—A numbered clip fastened in the ear of an animal for identification.

Expense—Cost; any item that you pay for or that has value.

Fertility—Capacity for bearing young.

Fitting—Conditioning, grooming, feeding and otherwise preparing an animal for a livestock show or fair.

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

Freshen—To give birth to a calf and start giving milk.

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

Grade animal—An animal from parents that are not purebred and of the same breed.

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.

Heifer hef'er)—A female calf or young cow that has not freshened.

Herdsmanship—Caring for animals. Doing chores.

Identification—Any marking that helps you to tell one animal from another. Eartag, brand, spots, color, etc.

Income—Money or other benefits received from sale or use of products or services.

Infestation—The presence of bugs, germs, parasites, rodents, weeds, or other undesirable plant, animal, or insect life.

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

Irrigated pasture—Pasture grown on land that is irrigated during the growing season.

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

Laxative—Property of a feed or medicine that loosens or relaxes the bowels of an animal, or relieves constipation.

Legumes—A group of pod-bearing plants grown for

livestock feed; such as, clovers, alfalfa, vetches, peas, and beans. High in 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. Sometimes animals lose milk-producing ability from having had mastitis.

Mature record—Milk and milkfat production of a cow at 6 to 8 years of age inclusive.

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

Milkfat—The natural fat in milk. The main ingredient of butter. Butterfat.

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, and normal body functions.

Navel cord—The tube at the center of the abdomen connecting an unborn animal to its mother.

Nurse—To suckle. A young animal suckles the udder of its mother for milk.

Offspring—A son, daughter, grandchild, or group of descendants of an older animal.

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

Pedigree—A record of parents, grandparents, and older ancestors; a family tree.

Posing—To place or stand an animal in a position that best shows its features to a judge or spectators, as in showing animals at a fair.

Powdered milk—Skim or whole milk that has been dried to a powder form.

Progeny—Offspring; sons or daughters of either males or females.

Protein—A food necessary for growth and maintenance of all animals. Found in all plants in varying amounts. Larger amounts in green leaves, legumes and

soybeans, cottonseed and linseed meals. Needed for body building—muscles are mostly protein. Closely associated with nitrogen and nitrogen compounds in plant or animal tissues.

Proven sire—A bull with enough daughters whose records of milk and milkfat have been compared with their dams. Shows how the bull influences the production of his daughters above or below that of their dams. A record of a bull's ability to transmit milk and milkfat production.

Purebred—An animal whose parents are of the same breed and are registered or eligible for registration in a recognized breed association.

Registered animal—A purebred animal listed in the records of a breed association and given a registration number. Registration papers show parents of the animal and their registration numbers.

Roughage—Any coarse food or forage such as silage, pasture, or hay.

Rumen—The first stomach or paunch of ruminating animals. Animals that chew a cud are ruminating animals; such as cows, goats, and sheep.

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

Scours—A disease or intestinal condition similar to "diarrhea," caused by germs or poor feeding and management.

Serve—To breed.

Silage—Forage, cut green and stored or "canned" in a silo or stack, to go through a preserving process. Used to feed animals when fresh forage is short or not available.

Single-service filter—A filtering material usually made of cotton and used for only one milking. Discarded after one use.

Sire—A male parent; father.

Skim milk—Milk from which most of the fat or cream has been removed; separated milk.

Sterilized—Free from germs by the use of chemical solutions or heat (steam or boil).

Sterile—Free of germs.

Sterile—Unable to produce young.

Succulents—Feeds that are full of their natural juices. Kale, pasture, green-chop forage, silage, etc.

Tattoo—A permanent mark formed in the skin of an animal, usually in an ear, by pricking the skin with sharp-pointed instruments coated with ink.

TB (tuberculosis) (tu-bur'-ku-lo'-sis)—The common term used to speak of the infectious disease, tuberculosis.

TDN—Abbreviation for "Total Digestible Nutrients." All the ingredients in food that are retained and used for body maintenance, energy, and growth.

Teats (teets)—The nipples through which milk is drawn from the udder.

Transfer—Refers to recording the change of ownership of registered livestock with the breed association.

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

Vaccination—To inoculate an animal with a vaccine; to give immunity to a particular disease.

Vitamins—Found in most natural feeds. Needed for health and growth.

Whole milk—Natural milk with nothing removed.

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