

A-H Dairy Management Manual

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COOPERATIVE EXTENSION WORK
IN
AGRICULTURE AND HOME ECONOMICS
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TABLE OF CONTENTS

Index	3
Introduction	5
Object	5
Requirements	6
Monthly Schedule of Work	6
Selection of the Dairy Calf	8
Selection of the Dairy Cow	8-12
Capacity for feed	
Constitution	
Mammary System	
Breed Type	
Raising Heifers	12-16
Care of Newly Born Calf	
Feeding Calves	
Dairy Feeding Rules	16
Feed Production Plans	22
Housing	22
Care of Cows at Calving Time	24
Summer and Winter Care	24
Production Records	26
Bull Management	26
Diseases	27
Insects	32
Dairy Cattle Judging	33-38
Model Set of Reasons	
Show Fitting	38
Team Demonstrations	41
Marketing Dairy Products	45
Steps in Washing Milk Utensils	45
Care of Cream	45
References	47

FOUR-H DAIRY MANAGEMENT MANUAL

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INTRODUCTION

Oklahoma has the advantage over older dairy states in climate and location for dairying. Our mild seasons reduce the cost of housing and make it an ideal climate for dairy cattle. Our long warm seasons are most favorable for pasture and dairy feed production. As to location, we find the cities all around us which import products from northern states. These favorable factors enable Oklahoma to lead the southern states in the value of dairy products marketed. However, the improvement of quality of dairy cattle, mostly through the use of better bulls, more feed production and better systems, greater care in proper management and improvements in our marketing of dairy products helped Oklahoma to make splendid progress. Much good work is to be done along dairy improvement, especially more economical production. Four-H Dairy Club members and dairy farmers may read the instructions in this bulletin, study them carefully and follow them closely. This will help in bringing about a practical system of dairying, so that a greater satisfaction will result in caring for dairy stock, continual herd improvement be effected, better dairy exhibits be found at fairs, and that greater profits be realized from the average cow in the herd.

OBJECT

The objects of the 4-H Dairy Club work are:

1. To teach dairy facts which will enable the member to properly manage dairy calves and cattle.
2. To encourage the members in this important farm activity, which blends into general farming so nicely and supplies so much food for the home.
3. To give greater knowledge of dairy business principles, which usually lead to successful dairying.
4. To teach feed production and proper feeding for economical milk and butterfat production.
5. To give a better understanding of dairy improvement by culling, use of better sires and securing foundation animals.
6. To train members in dairy judging, team demonstration and skillful exhibiting of dairy stock.

REQUIREMENTS

Boys and girls between ages of 10 and 21 may start by enrolling in the 4-H Dairy Club, and purchasing a purebred high-grade dairy heifer calf, a yearling dairy heifer or dairy cow.

The calf phase requires the care, feeding, management, and exhibiting of the calf together with the keeping of specified records.

The heifer phase requires the care, feeding, management, and exhibiting of the heifer together with the keeping of specified records. The heifer should be bred to a purebred bull backed by at least a 500-pound butterfat record, but not until she is 15 months of age.

The cow phase requires the care, feeding, and management of the cow through one lactation period, together with the care of her offspring. Records must be kept and the cow should be exhibited at the fair.

The requirements and instructions of the county agent, home demonstration agent, Dairy Manual, club coach, and captain and dairy club report should be carried out conscientiously.

Members should attend club meetings, dairy judging schools, tours, club round-ups, and shows.

MONTHLY SCHEDULE OF WORK**January**

Select and purchase the dairy animal
Provide shelter and sanitary conditions
Feed a balanced ration
Breed yearlings and cows for fall freshening

February

Prepare plans for growing feeds and silage crops
Make the Babcock test for individual cow's milk
Supply legume hay with the ration

March

Plant feed for dairy animals
Attend judging schools
Continue hay and grain feeding
Make necessary records

April

Plant pasture and other feed crops
Prepare a dairy team demonstration
Supply Pyrethrum spray for fly control
Make the record and Babcock test

May

Keep pens and barns sanitary
Train animals to lead well and pose for show
Make a blanket for show fitting

June

Feed hay and grain with pastures
Give calves pasture sparingly
Keep on training the animal for show
Protect against flies
Make another Babcock test

July

Keep on feeding hay and grain
Supply plenty of fresh water
Attend tours, picnics, rallies, and round-ups
Prepare silo and machinery for filling
Harvest and store feeds

August

Plant fall pastures, wheat, oats, barley or rye
Train for judging contest
Prepare stall for the cow which is due to freshen
Prepare and store crops and hay
Test the milk for butterfat
Fit and train animal for the show
Take a picture of your cow or calf

September

Attend fair and exhibit the animal
Provide shelter for calf
Wean calf when two days old
Feed mother's milk for four weeks
Milk the heavy producing cow three times daily
Feed pasture, hay, grain mixture to the cow

October

Prepare for winter feeding
Fill the silo
Change calf feed from whole milk to skim milk
Feed grain and hay to calf
Locate a good dairy sire
Get reports up to date
Conduct another Babcock test

November

Hand in reports
Repair the barn for shelter
Feed pasture or silage with hay and mixed grain
Change to milking two times daily
Feed calf warm fresh skim milk with hay and grain

December

Breed cows for fall freshening
Plan new year's work
Conduct a Babcock test on your cow's milk
Feed silage, hay, and mixed grain

SELECTION OF THE DAIRY CALF

Soon after enrolling the question comes up, "What breed shall I select?" Much has been said about the best breed, but no single breed is better on all points than any other breed. Local conditions should be considered in selecting the breed, especially market requirements of dairy products, whether they are cream, whole milk, or other products. Also the most common breed in the community should be carefully considered for a choice, because this will make it easier for sale of surplus stock and securing high-class bull service. Finally, the breed which the member likes should be considered.

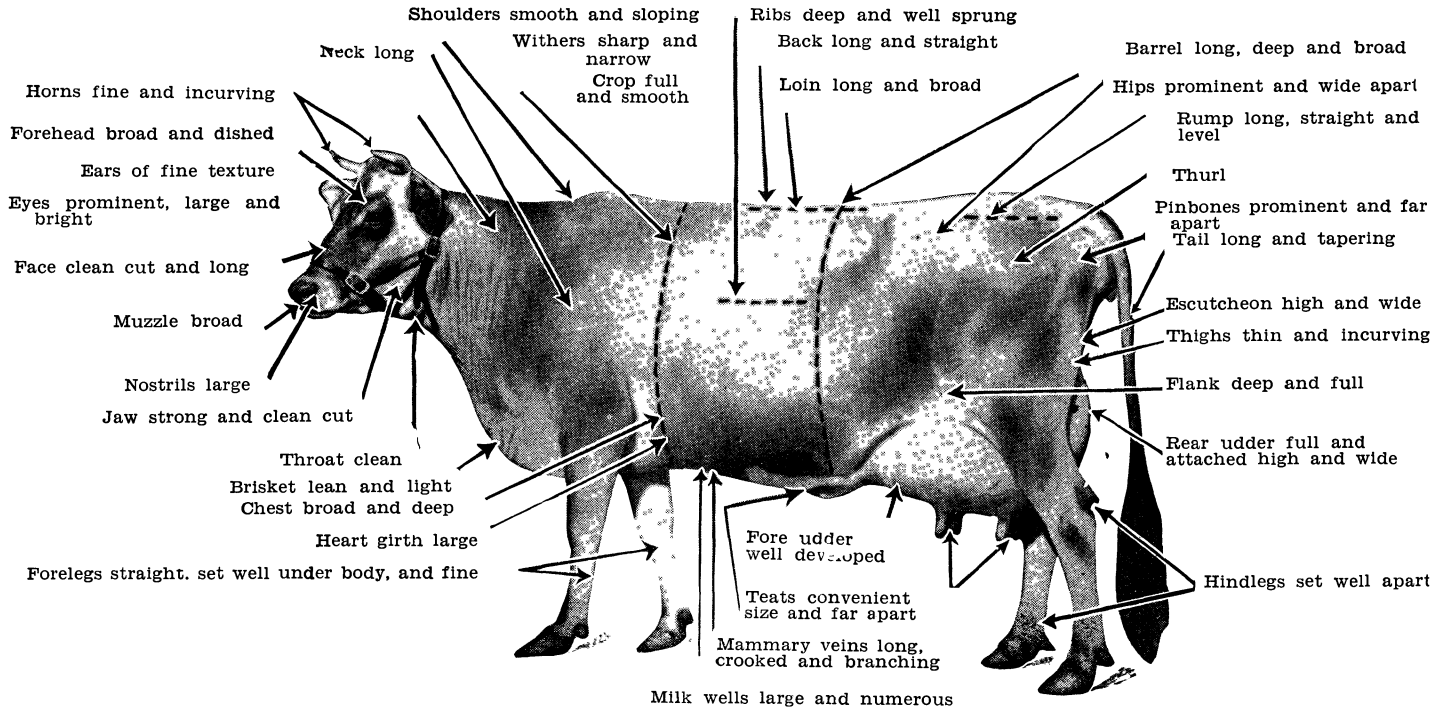
After the breed is chosen the question comes up, "Where can I buy the calf?" If possible, the calf should be purchased in the neighborhood because the buyer has a chance to see the calf before buying, and the breeder who sells the calf takes a greater interest in the club member. If this is not possible, the calf may be shipped in under the supervision of the county agent.

In selecting a calf the consideration of several factors is important. The herd from which the calf is selected should have uniform high-production records. Especially the mother of the calf should have a 500-pound yearly butterfat record or nearly that. The breeding of the herd should also be considered so the pedigrees show consistent blood lines. It is best to select calves from herds that are free from tuberculosis, contagious abortion, and other diseases. The type of the calf is very important. Stylish type and straight calves stir up an enthusiasm in the owner, not only in the show ring, but at home. Our present score card outlines type with production fully considered.

SELECTION OF THE DAIRY COW

The selection of the breed, finding the breeder who will sell the desired cow, consideration of records and pedigrees as well as the health of the herd from which the cow is selected was explained in selecting the dairy calf and should be observed in selecting mature cows, heifers as well as calves. In addition to these instructions, the following factors must be closely judged:

LOCATION OF POINTS OF DAIRY COW



SCALE OF POINTS		Perfect Score	Student's Score	Corrected Score
I. Characteristics Indicating Dairy Form:				
(a) Style and general Appearance—20 points				
1. Head erect, clean cut; neck slender, eye prominent, alert and placid		3	-----	-----
2. Back straight and strong; hips wide apart and level		4	-----	-----
3. Rump long, wide, and level; thurls wide apart and high, level tail setting		5	-----	-----
4. Legs straight, bone fine		3	-----	-----
5. General build rugged and large for the breed without coarseness; Jerseys 950 lbs., Guernseys and Ayrshires, 1,100 lbs., Holsteins, 1,350 lbs.		5	-----	-----
(b) Dairy Conformation—15 points				
6. The cow should be clean cut with feminine appearance, absence of tendency to lay on fat		5	-----	-----
7. Shoulders, withers, vertebra, hips, and pin bones prominent and free from fleshiness (period of lactation to be considered)		4	-----	-----
8. Loin wide, ribs long and wide apart		3	-----	-----
9. Disposition active, with good nerve control		3	-----	-----
II. Characteristics Indicating Constitution, Vigor and Condition—15 points				
10. Chest broad and deep with well sprung ribs		8	-----	-----
11. Nostrils—large and open		2	-----	-----
12. Condition—thrifty and vigorous, in good flesh but not beefy		5	-----	-----
III. Characteristics Including Ability to Consume and Digest Feeds—15 points				
13. Muzzle large; mouth broad		1	-----	-----
14. Skin mellow, loose, medium thickness showing good circulation and secretion; hair soft		4	-----	-----
15. Barrel deep, wide and long, well supported; ribs far apart		10	-----	-----
IV. Characteristics Indicating Well Developed Milk Secreting Organs—35 points				
16. Udder:				
(a) Capacity—large in size		7	-----	-----
(b) Quality—pliable, free from lumps		7	-----	-----
(c) Shape—extending well forward and well up behind level on floor, not pendulous, quarters full and symmetrical		6	-----	-----
17. Milk Veins—large, long, crooked and branching; milk wells large and numerous		7	-----	-----
(a) Milk veins on udder crooked, numerous		3	-----	-----
18. Teats—convenient size, uniform and well placed		5	-----	-----
		100	-----	-----

DAIRY TEMPERAMENT. This is also called dairy conformation and indicates the ability of the cow to convert feed into milk. This distinguishes dairy cattle from beef cattle. To select a cow with proper dairy temperament we should first look for refinement, or freedom from fleshiness. The greatest refinement should be found in cows that have given milk for a month and up to the time the decline in milk shows the approach of the dry period. The least is found between the time the cow is dried off and the month after calving. Among breeds we find extreme refinement in Jerseys, but moderate refinement in other breeds. A long cow, prominent in the eyes, withers, hips, and pin bones is desirable. A feminine appearance expressed by a clean-cut face, a medium long, flat neck, a thin V-shaped brisket, are marks of dairy temperament. The general form of the body should be wedgelike. The narrow withers and wide chest make a front wedge. The narrow withers and wide hips make a top wedge. The extreme depth of the cow from the hips to the teats, tapering toward the neck, presents a side wedge. In addition to those points, dairy temperament is indicated by curving thighs, length of the rump and width between hip bones, pin bones and thighs.

Capacity for Feed

Dairy cows should have large feed capacity, so that heavy production is possible and a large share of the feed may be of the cheaper kind, the roughage. The anatomy of cows is such that roughage can be well handled and converted into milk. So we look for a wide muzzle, a long, deep and wide body, also called barrel. The ribs should be wide apart, well sprung and long.

Constitution

The cow that produces a large quantity of milk during nine or ten months of each year and brings a good, thrifty calf each year must have a strong constitution to keep up this production for a number of years. Wide open nostrils, a wide forehead, a straight strong back, level in the rump, deep and wide in the chest, high in the thurls, as well as straight and strong legs show a strong constitution. A mellow, pliable hide indicates health, especially good digestion.

Mammary System

This includes the udder, teats, milk veins, and milk wells. The most skillful judging is required to select cows with good udders. And no part is as important as a cow's mammary system, because it holds the glands which make milk. This must not only be the right size, shape, and quality, but free from

meatiness, lumps, and disease. An udder should be large, wide, carried well forward under the cow's body and attached high behind. It should be uniform in its four quarters, but not cut between quarters or halves. A network of veins on the sides of the udder is very desirable. Milk veins should be long, large, crooked, branching, and mellow. The teats should be of convenient, uniform size and be squarely placed. Milk veins should be numerous and large.

Breed Type

In selecting dairy animals we want those which represent the breed in type. All breeds should conform to the general dairy conformation and have large feed handling capacity, a strong constitution as well as the above described milk secreting system. Each breed has special color markings, a standard weight, and a few other points which distinguish it from other breeds. So, in selecting the cow we should select one that conforms closely to the breed requirements. In the show ring as well as in the sale of cattle, this is important.

Jerseys may be varied in color but fawn or fawn with white markings, are preferred. A full aged Jersey should weigh 950 pounds. Jerseys should be very highly refined, have a double-dished face and a shorter head in proportion to other breeds.

Guernseys are orange colored with white markings. A mature Guernsey should weigh 1,100 pounds. A special characteristic is the yellow secretion. This is especially noticeable in the ears and in the switch. Guernseys should be refined throughout.

Ayrshires are white with red marks and weigh 1,100 pounds when fully aged. The special characteristics are the curving horns and the beautiful, straight back line and well-shaped udders.

Holsteins are black and white marked and weigh 1,350 pounds when mature. They are more rugged and larger than other dairy breeds.

RAISING HEIFERS

Care of the Newly Born Calf

Special care is needed during the first few weeks of the life of a calf. First of all there should be preparations made for the cow before calving time. Cows should not be allowed to calve in the barnyard or while standing in a stanchion. A clean, well-bedded, disinfected stall should be provided where the cow can move about at will and deliver her calf. The new-born calf

should receive some of its mother's first milk to stimulate action of the digestive tract. The cow will usually lick it dry, but if she fails to do so, the member may use a sack to wipe it dry. During the first day the navel of the calf should be disinfected. Tincture of iodine should be applied, but the naval cord should not be tied. While this is being done the small teats of the heifer may be examined and extra teats may be clipped with scissors and the cuts should be disinfected with iodine.

If the calf is strong and the cow in good condition the calf may be weaned on the second day. Weak calves should be weaned during the third or fourth day. For several reasons all members should wean calves permanently and not carry on the old practice of letting calves suck a while and milk the cow after that. Calves over three or four days old may get too much milk if permitted to suck. This causes digestive disturbances and the loss of many calves. It is harder to wean the calf that is permitted to stay with its mother too long a period of time. It is also harder to teach the calf to drink. Also, the milking is easier and the cows give down milk more freely if calves are permanently weaned on the second or third day. To wean the calf remove it from its mother to a clean, well-bedded, disinfected pen where no drafts strike it.

The calf that has been kept in its pen without feed for 12 hours is ready to be taught to drink from a bucket. An old dairyman said that teaching a calf to drink requires more sense in the man than in the calf. So just a common sense-method should work easily. Take a quart to three pints of fresh warm milk from the calf's mother and feed this from a clean bucket. Back the calf into a corner, straddle it, and put the bucket in front of it. Dip two fingers into the milk raise the bucket up to the calf's mouth and place the fingers in its mouth. When it starts to suck the fingers, draw its nose into the bucket, and raise the bucket gradually so the milk will touch the calf's mouth, and not frighten it. Spread the fingers a little so that the milk will be drawn into its mouth gradually. Repeat this operation if necessary. Many calves handled in this manner will drink at the first feeding.

A more modern way of feeding calves is the use of a bucket with a spout covered with a lamb nipple. The opening in the nipple must be enlarged for calves. This enables calves to receive the milk in a more natural way and in smaller quantities.

Feeding Calves During First Two Weeks After Birth

The quantity of milk, cleanliness, and the regularity of feeding, are the main points to keep in mind during the first

few weeks. Feed the calf at regular periods, two or three times a day, depending on its health and strength. Weak calves should be fed smaller amounts and oftener than the strong ones. The exact amount of feed will depend on the size and physical condition of the calf.

A calf weighing from 30 to 60 pounds at birth should not be fed more than eight pounds (pints) of whole milk daily, divided equally between the different feeds. A calf weighing from 65 to 100 pounds may be fed 10 pounds (pints) of whole milk daily to begin with.

Second Two Weeks—Increase the amount of milk at the rate of one pound per week. Offer the calf a mixture of equal parts of oats (ground or whole), cracked corn and bran. If linseed meal is on hand, feed equal parts of oats, corn, bran, and linseed meal. Calves under three months of age will not overfeed, but older calves should be limited to three or four pounds daily. Also allow the calf to have a little good grade fine stemmed alfalfa, cowpeas, or other hay. Offer the calf clean, pure water each day after it is two weeks old.

One to Two Months of Age—Gradually change from whole milk to skim milk, changing at the rate of one-half pound daily. Any sudden change of feed may result in a serious setback to the calf. At six weeks of age, the calf may be fed skim milk entirely.

Two to Six Months Old—If skim milk is plentiful, feed the calf 10 to 20 pounds daily until it is six months old. Feed the calf all the grain it will eat. A small amount of salt should be supplied to calves two to three months old.

Six to Twenty-four Months of Age—Skim milk may be continued until heifers are one year old or older. Silage, grain, and hay may be fed, but pasture with some leguminous hay will be satisfactory. Two or three weeks before calving time the heifers should be brought in from the pasture and placed in a box stall. The following ration should be fed:

One part wheat bran, 2 parts ground oats, 1 part corn, 1 part linseed meal, or

Four parts ground oats, 2 parts wheat bran, 1 part linseed meal.

A pound of grain to every 200 pounds of live-weight in addition to a good legume hay and silage should be fed.

Milk substitutes are needed where farmers sell whole milk. Powdered skim milk is used with success in many dairies. One pound of this is added to nine pounds of warm water (100° F). A wire beater, like an egg beater, is best to thoroughly mix the solution. In experiment stations it has been proved that calves do well on this feed and when changed to this from ordinary skim milk and again to the solution, calves apparently did not notice the changes. As this is simply skim milk from which most of the water has been removed we find powdered skim milk a good substitute for ordinary skim milk.

Calf meals are used extensively and successfully, instead of ordinary milk where whole milk is sold. It is a little harder to keep buckets clean where meals are made into gruels and fed to calves. A home-mixed meal may be made from the following: By weight, 50 parts yellow corn meal, 15 parts finely ground oats, 15 parts linseed meal, 10 parts powdered skim milk, 10 parts blood meal (dried blood flour), one-half part salt. To mix this use equal parts of this calf meal mixture and cold water; stir to make a smooth mixture. Then add 8 pounds of hot water (100° F. to boiling) to each pound of calf meal used. Allow this to stand for 2 hours, warm to 100° F. and feed as skim milk. Do not prepare more than one day's ration and mix meal and water fresh each day. Best results are obtained if strict sanitation is observed and calves are allowed to have cow's milk until four weeks old and changed gradually to the gruel.

Feeding the calf meal dry is a more modern method, saving labor and enabling the calf to eat the meal more slowly.

Water and salt requirements are often overlooked. In Oklahoma we have hot weather for several months and calves need fresh, cold water in addition to the milk fed daily. When calves are two to three weeks old they should have access to water whenever they desire a drink. If penned up, water should be offered several times daily. As soon as a calf eats hay, the salt box should give access to salt at will.

If calves are on dry feed and receive no legume hay, equal parts of salt, feeding lime, and bone meal should be fed.

Sanitation is a big word, but is more important in calf raising than most other factors. It means not only clean buckets, utensils, pens, bedding, feed, and the calf's body, but well-washed and sterilized buckets and utensils, by use of live steam or boiling water; also a clean, disinfected pen cleaned out daily and bedded liberally. Bedding and feed should be free from mould, dust, and spoiled qualities, and the calf's body free from

manure, dirt or odors. This means the use of a standard disinfectant and fly sprays. The loss of most calves is doubtless due to the neglect in sanitation.

Housing calves is very important even in the southern states. The general work on housing is explained under cow management, but the parts of the barn and the open sheds for calves will be briefly described. Calf pens where calves are kept up to four or five weeks of age should be located in a well lighted part of the barn, should allow at least 5x5 feet floor space per calf and if possible, they should be arranged so sunlight may reach the calf during a part of the day. When several weeks old, calves may be housed in an open shed, so direct sunlight strikes them during most of the day. If the weather is mild, this is best for calves. Calf stanchions are easily constructed. They are important for several reasons. They make feeding easier. Sucking other calves' ears is prevented. Proper portions of feed can be fed in stanchions and calves will not rob the weaker ones. Calf barns protect calves from cold, rain, snow, hot sun, flies, inclement weather, and other stock which molests calves.

Breeding the heifer at 15 months of age is considered correct. At calving time she will be a two-year old heifer. However, when fall freshening is desired, the heifer should be bred in December or January, but after 15 months of age, and not prior to that age. The careless practice of having heifers over five months old in the same pen with bull calves causes stunted heifers, due to being bred too soon. To be safe the heifers of this age should be kept separate from bulls of all ages to avoid early breeding, which results in stunted cattle. Another factor is very important. The bull used should be good type and have at least a 500-pound butterfat record, when his three nearest dams are averaged.

DAIRY FEEDING RULES

The most economical and profitable dairy rations have a legume hay or pasture as a basis. During the winter months, the dairyman is fortunate if he has some succulent feed such as silage or mangels to use with the legume hay. In many parts of the state winter wheat, barley, rye and sometimes winter oats are available for pasture during favorable seasons. However, they cannot be relied upon wholly. Cereal pastures seldom provide succulence during a summer drouth.

Cows producing more than 150 pounds of butterfat in a year require both roughage and grains in the rations. Separate feeding rules apply to these classes of feed. The rough-

ages are fed in proportion to the body weight of the animal, while the grain ration is used in proportion to the yield and richness of milk.

1. Feed all the roughages that a cow will eat clean without waste. Careful observation of the feed consumed per day discloses that this usually follows closely one of the feeding rules given below:
 - (a) 20 pounds of dry hay or fodder per 1000 pounds liveweight, or
 - (b) 10 pounds of dry hay and 30 pounds of silage per 1000 pounds liveweight, or
 - (c) 10 pounds of dry hay and 60 pounds of mangels per 1000 pounds liveweight.
2. Feed grains in proportion to the yield and richness of milk. Increase the amount of grain slightly when used with lower quantity roughages, or with cows yielding over one pound of butterfat daily. The protein content of the grain ration must be such that it is adapted for use with the roughages fed. Cows receiving hays require less protein in the grain ration.

If the entire roughage ration consists of legume hay or legume pasture, the entire grain ration may be made up of ground farm grains.

Should Rules (b) or (c) be followed, with a good legume hay (leafy alfalfa, soybean, cowpea, or mung bean hay) and a succulent feed, use a grain ration containing 16 percent of total crude protein, feeding:

- (d) One pound of grain for each 3 pounds of Jersey milk.
- (e) One pound of grain for each 4 to 4½ pounds of Holstein milk. With cows producing over one pound of butterfat, add 1 to 2 pounds more grain. If the butterfat yield is up to 2 pounds daily, add 3 to 4 pounds more grain per day in the above rules.

With lower quality legume hay (stemmed alfalfa, red clover, peanut hay, sweet clover, etc.) and a succulent feed, use a grain ration that contains 18 to 20 percent of total crude protein. The amount of grain will need to be increased slightly over the amount stated above.

Grass hays, (prairie, Sudan, Johnson, cane hays, and stover) require the use of a grain mixture containing 20 to 24 percent of total crude protein, and also require that the quantity of grain be increased 10 to 15 percent above that stated in Rules (d) and (e). With the grass hays which are lower in mineral, it is better if mineral matter be added to the grain. One pound salt and one pound very finely ground calcium limestone and one pound of finely ground feeding bonemeal may be added to each 100 pounds of grain.

If equal amount by weight of a legume hay and a grass hay (cane, Johnson, prairie or Sudan hay, or dry fodder), or if legume hay is fed with silage or mangels, the grain ration should provide about 16 percent of total crude protein, and less than 10 percent of crude fiber. The rations in the following table are used widely with such roughages. When fed to very high producing cows, these rations may need an additional one-half pound or pound of a high protein concentrate (or two pounds more of wheat bran) in addition to the required amount of one of these grain rations, as stated in Feeding Rules.

Grain Rations Adapted for Use With Such Roughages as a Mixed Legume and Grass, or Silage, or Mangels, in Amounts as Stated in the Feeding Rules.

	Ration 1	Ration 2	Ration 3	Ration 4	Ration 5
Oats, ground -----	300	300		300	300
Wheat bran -----	400		200		
Cornmeal, or ground kafir -----	200	400	400	400	400
Cottonseed meal ----- (43% protein)	100	100	100	100	
Corn gluten feed -----				100	
Soybeans, ground -----					200
The above rations provide:					
Total crude protein ---	16.3	14.8	16.2	16.0	16.5
Digestive crude protein -----	13.0	11.8	12.9	12.9	13.8
Total digestible nutrients -----	69.6	77.0	75.3	77.4	80.7
Crude fiber -----	8.3	6.1	5.0	6.2	5.4

Grain Rations Adapted for Use With Grass Hays and Other Low Grade Roughages.

	Ration 6	Ration 7	Ration 8	Ration 9
Wheat bran -----	100	200	200	300
Oats, ground -----	200	100	100	
Cornmeal, or ground kafir -----				100
Cottonseed meal ----- (43% protein)	100	100	100	100
Corn gluten feed -----			100	
Linseed oil meal -----		100		
Soybeans, ground -----	100			100
The above rations contain:				
Total crude protein -----	24.1	24.2	22.6	22.8
Digestible crude protein -----	20.4	20.3	18.6	19.1
Total digestible nutrients -----	74.8	69.7	70.2	72.6
Crude fiber -----	8.7	9.3	9.0	7.1

The quantity of grain needed to feed a cow during the year varies with the production of the cow, and with the kinds of roughages fed. In general, a 1,000-pound cow eats about 4,500 pounds of dry hay during the year, or about 2,200 pounds of dry hay and 5,500 pounds of silage, in addition to the pasture. When mangel beets replace silage, four or five tons of mangels are needed per cow. If the roughage portion of the cow's ration consists solely of legume hay, she will need about 1,600 pounds of grain to provide for a yearly production of 250 pounds of butterfat. With grass hays, the same cow would need 1,850

Suggested Cropping System to Provide Home-Grown Feeds for a Five-Cow Dairy in Eastern Oklahoma.

Feed Crops	Variety	Amount Needed	Acreage	Time of Planting	Rate of Seeding per Acre	Average Yield per Acre
Soybean hay	Virginia or Laredo	5 tons	3	Late April to May 15	15-25 lbs.	1½-3 tons
Mangel or	Mammoth Long Red	25 tons	2	Early April	10-15 lbs.	10-15 tons
Silage, Corn or	Bloody Butcher Strawbery June Corn	15 tons	2	Late March	6-10 lbs.	7 tons
Winter pasture	Wheat or Barley		10	Fly-free date	100 lbs.	
Oats	Fulghum Kanota	75 bu.	2½	February	64-80 lbs.	30 bu.
Corn	Midland Yellow Dent Silver Mine Pride of Saline	30 bu.	1¼	Late March or April	6-8 lbs.	25 bu.
Pastures: Sweet clover	Biennial White		5	September	15 lbs. hulled	
Native grass			5	March or		
Sudan grass			5	Early April May	30 lbs.	

Suggested Cropping System to Provide Home-Grown Feeds for a Five-Cow Dairy in Eastern Oklahoma.

Feed Crops	Variety	Amount Needed	Acreage	Time of Planting	Rate of Seeding per Acre	Average Yield per Acre
Cowpeas or Sudan hay	Whippoorwill	5 tons	3	May 15 to June 13 May 15	20 lbs.	1½-3 tons
		5 tons	2½		5 lbs. in rows	2-3 tons
Kafir or Silage Winter pasture	Sunrise	15 tons	4	May	7 lbs.	3-6 tons
	Wheat or barley		10	Fly-free date	100 lbs.	
Oats	Fulghum Kanota	75 bu.	2	February	64-80 lbs.	20 bu.
Kafir	Blackhull Darso	30 bu.	1½	May	7 lbs.	20-30 bu.
Pastures: Sudan grass Sweet clover Native grass	Biennial White		5 25-30	May 15 March or Early April	10 lbs. 15 lbs., hulled	

pounds of grain in order to make the same butterfat yield. With lower grade roughages such as straw, hulls, or stalk fields that have been bleached by the rains, this cow would require at least 2,400 pounds of grain in order to produce 250 pounds of butterfat, and keep from losing flesh. Higher producing cows cannot use more roughage, but do need more grain in the ration.

It is essential that the grain mixture contain 1% salt, 1% feeding lime, and 1% feeding bone meal.

FEED PRODUCTION PLANS

“Home-grown feeds help to make dairying profitable,” is a well-known slogan. A definite plan helps to provide the necessary feeds needed in a satisfactory dairy ration. It is not possible to lay out a plan that will offset weather conditions and other variable factors, but it is possible to outline a general guide which is practical, and can be applied to average climatic conditions over the state.

It is possible to suggest a crop plan that will provide the larger part of the feeds for five-cow dairy herd, suitable to eastern Oklahoma. One should understand that the plan is based on average climatic, soil, and tillage conditions. The plan may be used as a guide from which to make variations in the plantings suited to a particular farm or locality.

Credit is given the A. and M. College Agronomy Department for assisting in the arrangement of the foregoing two tables.

HOUSING

Shelter for cows is needed during all seasons. The old idea of not protecting cows against flies, cold, hot sun, and storms, but letting cows “rough it” is not practical. Good dairymen would not expect any profits without proper housing of dairy cows. A comfortable, contented cow will do much better than one troubled by flies and unfavorable weather.

Dairy barns need not be expensive, but should meet four requirements. They should be sanitary, well lighted, comfortable to cows and well ventilated, but free from draughts. Three types of barns will be considered, the cheap, open shed, the moderately-priced dairy barn, and the complete dairy barn for commercial dairymen.

The open shed for dairy cattle may be sanitary, is well lighted, comfortable for practically all days of the year in Oklahoma and is well ventilated. The greatest advantages are the low cost and ease of keeping clean.

In Oklahoma we do not need the expensive barns described in bulletins and books. One type used on many farms is very economical and entirely satisfactory. The open shed barn is cheap and exactly suited to our needs. It is well ventilated, yet free from draughts. The sunlight strikes all parts of the floor and gives warmth and destroys germs which usually infest dairies. Extra bedding is needed which is an advantage because more manure is made to add to the soil fertility of the farm. Cows have more freedom which under well-managed conditions is favorable.

To build this barn, lumber or any barn material may be used. The north wall should be from six to seven feet high and long enough to allow three and one-half feet width for each cow. The east and west sides should be from 14 to 20 feet long and 10 feet high on the south side. The roof should be water-tight and the three walls should be wind-proof. The floor may be dirt or concrete to suit the sanitary requirements. Mangers or stanchions may be built in against the north wall. Posts which hold up the roof on the south side may be six feet apart. On many farms this barn plan has worked out very successfully.

A moderate priced dairy barn may be built for the average 10-cow dairy. In this plan there is room for 16 animals in stalls and gives room for calves in the box stall. The extra room will allow for increase in the herd. This plan is satisfactory from a sanitary standpoint, the ventilating system can be properly arranged, and it provides more shelter than the open shed type. The floor may be made of concrete, providing for the manger and gutter when the floor is constructed. The space between the wall and the manger should be 3 feet, total manger width 2 feet and 6 inches; from the stanchion to the gutter 4 feet and 8 inches; the gutter should be 10 inches wide and 6 inches deep; this leaves 6 feet for the alley back of the cows. The thickness of the concrete should be from 8 to 10 inches to insure durability. From the standpoint of cost, durability, ease of construction and sanitation this is a good dairy barn.

The walls and other parts of the barn may be made of any material that the owner may desire, lumber, hollow tile, concrete, or cobble stone. However, the window space must be observed to secure proper lighting. Four square feet of glass per cow is considered satisfactory lighting. Windows may be fastened with hinges at the bottom and tipped at the top for ventilation. The amount of ventilation may be regulated by use of a small chain attached to the window and hooked on the wall.

The large type of dairy barn, which is well-fitted for commercial dairymen has been planned by the American Society of Agricultural Engineers. This plan will give the dairyman the best arrangement from every angle possible for sanitation, convenience, warmth, ventilation, durability, appearance, and comfort for cows as well as men at work; but we find this plan much more costly than most others.

CARE OF COWS AT CALVING TIME

Cows should be dry at least six weeks before calving time. This will give the cow time to build up her body so she is in prime condition for her next lactation period. Even if cows are well-fed, some materials from her body have been used in milk production, especially minerals and fat. So a low protein ration should be liberally fed during the six or eight weeks before calving time. As the normal period of gestation is 183 days, the day of calving can be fairly accurately determined. Before the calving date is due the grain fed should be reduced gradually, so that on the date of calving she will receive only a warm bran mash and hay, but should be in a laxative condition. The cow should be kept in a disinfected, clean, well-bedded box stall when the calf is due. During calving the cow should receive assistance from the owner when necessary either in day time or at night. A little attention at the right time will often save the calf, or cow or both of them. If the cow does not clean properly, or shows signs of garget, milk fever, or other ailments, the assistance of an experienced dairyman or veterinarian should be secured promptly. Do not milk the cow dry during the first 36 hours to avoid possibilities of milk fever. In summer use fly spray to keep the cow quiet during calving time.

On the second day the calf should be permanently weaned and the cow may be milked three times daily if she is a heavy producer. Silage should not be fed during calving time, but should be started gradually after the calf is weaned. As to pasture, the same rules applies. The grain mixture should be started on the third day if conditions are normal. A gradual increase in amount may be made, so that on the eighth or tenth day she may be on full feed. However, this is not a fixed rule, because cows differ greatly and many are more nearly normal and can be handled this way, while others must be fed grain and more time is required till they are on full feed after calving.

SUMMER AND WINTER CARE

Summer care includes good feed, using a balanced ration in liberal quantities. The supply of fresh, cool water in large

quantities which the cow can reach at all times is necessary for economical milk production. The salt supply may be given in small quantities in the grain mix, one pound to 100 pounds grain mixture. This is not always enough and a block of salt should be at hand to complete the salt supply as animals need it.

Shelter and shade is necessary in summer to get protection from the hot sun, rains, and insects. If trees do not furnish shade in the pasture or yard, open sheds should be built so cows can find shade any time. In protection against flies, the dark shed or barn will give much relief.

Kind treatment is essential in dairying. A friendly word with a gentle touch on a cow's back goes a long way to make conditions most favorable for economical production, while the beating of cows or allowing dogs to drive them is very costly to the owner in poorer production.

Special winter care includes the correct balance of feed, when pasture is short or lacking. Silage takes the place of pasture very nicely. Thirty pounds can be fed daily to heavy producers. Stock beets may replace silage, but the cow needs about 60 pounds of chopped beets daily. In winter our dairy products sell for a higher price and it pays to feed succulent feed to secure heavy production. Salt feeding should continue. Water should be warmed with a tank heater or pumped fresh when cows need a drink. A tank heater costs about \$8 and enables cows to drink normal quantities of water. On the other hand, icy water is not agreeable to cows, and for a month or more the animals cannot drink enough water. Production falls off, digestion is retarded and more loss is realized on each cow than the cost of a tank heater.

Shelter is most necessary in winter because experience shows that a cold wave brings on a drop in milk production. At night the cows should have at least the protection of an open shed, which is weathertight on the east, north, and west sides as well as overhead. Still better, the cows should be in a dairy barn during the coldest nights. Milking is more comfortable and cows will use feed for milk production, mainly, and not for keeping the body warm.

Sanitation is neither very expensive nor hard to practice. However, the troubles arising from insanitary barns, cows, pens, and equipment are very costly. Disease and poor quality products are often traced to lack of sanitation. So in care of cows, the sanitary features of clipping flanks, wiping udders

with damp cloth before milking, and the brushing of cows is important. Cleaning barns by removal of manure and scrubbing floors, walls, stanchions, and mangers is essential. Yard must be sanitary and well-drained.

If dehorning is practiced, this should be done in winter so insects will not infect the sore places.

The milking should be done with both hands as quickly and quietly as possible. All the milk must be taken each time, which includes careful stripping, or the cow will soon go dry. The "dry hand" milking is the sanitary way and can be done just as quickly with a little practice.

PRODUCTION RECORDS

Records are very essential in dairying. In the cow-testing associations farmers have found that the looks of a cow or the measuring of milk in buckets deceive us. Unless milk is weighed and tested at regular intervals, the poor producer may be fooling the dairyman and eat with the rest of the herd till old age disqualifies her. Milk sheets, regular milk scales, and a Babcock testing outfit constitutes the equipment. For juniors the weights of milk are recorded for various days. From these weights the monthly pounds of milk are calculated. At least four butterfat tests are made two months apart for the average test. A butterfat test each month is still better and more accurate. By multiplying the test by the pounds of milk, we find the pounds of butterfat. For a good cow we expect at least a pound of butterfat daily on the average.

The breeding record should be carefully kept, giving date of service, name of sire, name of cow, date to calve, and later the date of birth and sex of calf should be recorded.

BULL MANAGEMENT

Selecting a bull is done by almost the same points as females, excepting the sex characteristics. Desirable features are the large feed handling capacity, strong back and great depth of chest, freedom from fleshiness and a general dairy conformation; also trueness of type for the breed. In addition to these points dairy bulls should show a very masculine head, a crest at about 1½ years of age and widely spaced, medium sized rudimentaries. Bulls should show great vigor, which often manifests itself in fighting and meanness. This is a very favorable characteristic, rather than the reason for selling older bulls, which may be proven for siring producers. In addition to the type appearance of bull, one should insist on a pedigree

showing consistent mating. Most important, however, is the record of the dam, grand dams and other females in the pedigree. Good bulls show high records as a rule for the dam and the two grand dams. At least a 500-pound-butterfat average is necessary for the three females mentioned above to insure us the privilege of calling the sire a bull with a good record. All the above rules have given way to the proven sire efficiency. So it is safest to use sires with excellent tested daughters.

Feeding and the supply of water and salt is very important and may be done in conformity with the cow-feeding rules. Housing in an open shed is satisfactory, but very necessary. The bull pen should be constructed of strong fencing material to keep the bull away from the herd and under control at all times. This is necessary to avoid accident, but most important to control the breeding of animals. As mentioned before heifers should not be bred before 15 months of age. The keeping of the bulls in properly constructed pens will enable farmers to control the breeding so animals are bred at the right age and during the proper season for fall freshening as is desired by most farmers. In addition to these advantages we find that this piece of management saves the bull, so he may be useful for many years. Only one service is allowed for each cow and only one is served per day in well managed dairies. This applies to bulls two years and over, while younger bulls should be allowed light service only. When a bull is eight months to a year old a ring should be put in his nose, to enable keeper to handle him with a bull staff. Exercise is very important and should be provided for. Leading the bull, placing him with other bulls or bull calves in a small pasture or tying him to a wire stretched between posts gives him a chance for exercise. Breeding records should be carefully kept.

DISEASES AND INSECTS

Abortion Disease

Cows contract this disease mainly by eating feed or drinking water which has been infected by diseased animals. Females are responsible for at least 90 percent of the spreading of germs by uterine discharges. Bulls rarely spread this disease.

Symptoms of abortion disease in the herd include the delivery of premature calves by some females, sterility of some cows, prevalence of mammitis, retention of afterbirth, and in the calf herd, scours and pneumonia.

Very little milk is given by aborters and economical production is seldom possible in infected herds. Detecting this disease in cattle may be done by the blood test, which is not dependable two or four weeks after abortion, but two tests 40 days apart may be conducted to indicate the germs in cattle. Many herds are tested each month and a fair determination may be made from such tests by competent veterinarians. This is not considered as a hereditary disease, and calves up to six months of age do not carry the germ, even in infected herds.

Treatment of diseased cows is not known to effect a cure, but females spread disease germs after they are immune and carry calves up to the time that the offspring is born alive and practically a normal calf. So control measures are considered most economical. In this system aborters are at once isolated, whether actually aborting or reacting to the blood test. Disinfectants should be used liberally, mineral feed supplied to cattle and if controlled early in the stage of infection, the disease may be stamped out in some cases. Farmers should be watchful to never bring a spreader into the herd and avoid abortion disease, because the cure looks impossible today and the control is often discouraging. When aborters have been removed and all possible precaution has been taken, a new outbreak often follows in a short time.

Tuberculosis of Cattle

The disease is infectious and is contracted by coming in contact with tuberculous cattle. One cow infected with this disease will cause tuberculosis in a large percent of the herd. At fairs, in freight cars, and pasturing cattle where tuberculous animals have been kept, the disease is transmitted to healthy animals.

The symptoms are not visible but lesions form in the glands of the body till the advanced stages may cause death of the animal. The great danger in having this disease in the herd is the action of tuberculin germs in milk on children, causing bovine tuberculosis which is fatal in many cases. Milk from tuberculous cows infects the calves, hogs, and animals drinking this milk.

It is not practical to attempt a cure for tuberculous cows. Each year a regular test should be conducted by a competent veterinarian. All reactors should be sold to packing plants for tannage. This enables one to have a tuberculin-free herd eventually, after systematically disinfecting the premises and conducting the yearly test.

Milk Fever

Causes of this disease may be heavy grain feeding or over-feeding during calving time. Many dairymen say that milking a cow completely dry during the first 48 hours after calving causes milk fever. So cows are partially milked until the third day after the calf is removed, when cows may be milked out clean with greater safety.

The symptoms are paralysis in hind legs, and tossing the head towards the flank. In many cases cows die unless relieved. The relief usually given by inflating each quarter with a milk fever outfit and tying the teats with tapes to retain the air until the cow is normal. In a few hours this should be removed. Several inflations are necessary at times to get the cow fully relieved.

Bloat

Pasturing on alfalfa, clovers, and other plants at times, especially when the dew is on the leaves, may cause bloat in cattle. Dry hay, roots, spoiled silage and other feeds often cause bloat. Gas forms in the paunch till it is inflated and may be extended above the back line. Death comes in a few hours at times, unless cows are relieved.

Treatment by exercising the animal may help when started in time. Bridling a cow with an ordinary bridle having a solid, heavy bit has caused cows to secure relief. Often it is too late, and the trocar and canula must be used. The sharp trocar fits smoothly in the tube termed canula and when inserted into a cow's paunch the trocar is pulled out leaving the tube or canula in place for the gas to escape. The most satisfactory place to puncture the paunch is the central point equally distant from the hip bone, last rib and loin. Point the trocar downward and forward when inserting it. Leave the canula, until the cow is fully relieved. Remove and disinfect the wound. Feed sparingly for several days, using highly digestible feeds.

Blackleg

Blackleg is contracted by infection and cattle from six months up to two years of age are subject to this highly fatal disease. Certain pastures or localities harbor the blackleg germs, and outbreaks come during certain seasons. However, stables or other places may harbor germs. Affected animals succumb so quickly that owners are not aware of the presence of the disease until several calves are found dead. The safest way is to vaccinate calves before each blackleg season if regular outbreaks are prevalent in the community. Calves vaccinated

before six months of age are not immune for life, but should be immunized with blackleg virus before the coming season. Trying to cure animals that are diseased is fruitless.

Anthrax

This infectious disease which attacks cattle, many other animals, and even man, is contracted from germs which may be found in infected places where diseased animals have been or germs carried by smaller animals. The symptoms are usually sudden death in cattle; however some types of the disease show visible diseased condition for several days. This is a disease much dreaded by livestock men because the death rate is high in anthrax outbreaks, vaccination is more difficult than immunization for other diseases, and man may be affected with anthrax germs. If any indications of this disease are noticed, veterinarians should be notified to take charge of the diseased herd.

Garget

Cows exposed to inclement weather or receiving bruises on the udder or fed heavily on rich feeds or infected from diseased cows by milk tubes or even the milkers' hands may contract inflammation of the udder, termed garget. Usually one quarter is swollen, hard and tender. Milk may be clotty, stringy, and bloody at times. Often the quarter dries up and outbreak occurs in another quarter and in other cows in the herd. Treatment is not sure to effect a cure. Laxatives, udder balms, and even vaccines are used, but certain results are not expected from treatments. Cows affected in this way should be isolated and fattened for beef.

Pink Eye

Contagion or irritation may cause this disease. Inflamed eyes and sometimes blindness for a time results. In treating this disease, an eye wash may be secured from a veterinarian. Animals not affected should be moved to another pasture or yard to avoid the spreading of the disease through the entire herd.

Cowpox

This is contracted by infection in most cases. The teats and udder are tender at first and the presence of the pock is soon noticed. In 10 days the blister forms in the center of the pock and usually breaks in three more days. A sore place results and later a scab forms. Treatment, to heal the sores, is

necessary as well as careful milking to prevent over-irritation. Zinc ointment or a solution of half an ounce hyposulphide of soda dissolved in a pint of water may be helpful in healing the sores.

Poisoning

Causes of poisoning may be minerals, as arsenic, lead, copper, zinc, phosphorus, or mercury. Acids, alkalies, crude oil, saltpeter, nitrate of soda, and an excess of common salt are poisonous to cattle. The following plants are poisonous to cattle: oak leaves (without other feed), buckeye, death camas, yew trees, laurel, common brake fern, second-growth of stunted sorghum, corn stalks in certain stages, water hemlock, larkspur, loco, and many fungus plants. An excess of protein feed may develop a poison effect in cattle.

Johne's Disease

Infected animals spread this transmissible disease by the passage of the germ in the manure only. So the contraction is rare as compared to tuberculosis. Through the mouth the cattle take in the germs of Johne's disease.

Symptoms are not visible in young stock and the disease may be active for years before a decline comes on. This often comes after calving, when cows lose flesh and become very poor before death. If the presence of this disease is suspected, a test may be given by a competent veterinarian. The Johnin test is well-proved and diseased animals may be removed from the herd as in eradicating tuberculosis.

Foot Rot

The manure and mud in which some cattle stand continually may cause foul foot, which is inflammation between the claws and may form abscesses and pus under the horny part of the claws. Treatment is to keep cattle on dry bedding or in dry yards and treat with a carbolic acid solution or powdered copper sulphate.

Impaction

Eating only dry grass, dry stalks or hay without drinking enough water, may clog the digestive tract. The cow may be dull, listless, and constipated. Often the imaginary diseases of cattle are attributed to impaction and other digestive disturbances. These are hollow horn, loss of cud, or wolf in the tail (hollow tail). Cruel treatments are given cattle in an attempted cure of these imaginary diseases. However, impaction is best treated by giving the cow from one to two pounds epsom salts and then feeding a balanced ration.

Calf Scours

From indigestion caused by unclean buckets, dirty milk, irregular feeding, overfeeding, changes in temperature or sourness of milk fed, dirty pens, or unsuitable feeds, the most common calf disease results, calf scours. Cleanliness, and carrying out the calf feeding rules usually prevent this. One to two ounces of castor oil is the dose used for checking ordinary calf scours.

White Scours in Calves

This highly infectious and fatal disease usually affects a number of calves at once. Sick calves pass light-colored droppings, sleep most of the time, do not take feed and die within three or four days. Strict sanitation and disinfecting navels of calves immediately after birth is necessary to check the disease. Often the entire calf crop is lost with white calf scours.

Calf Pneumonia

Chilling and presence of other diseases in the dairy herd often cause rapid breathing with high fever or pneumonia. Blanketing sick calves, placing them in a well-ventilated, clean stall free from drafts, is the treatment generally given.

Ring Worm

This contagious disease causes ring-like spots, breaking out usually on the neck, shoulders, and rump. Hair comes out and scales are formed. Washing the crust with soap and water with the help of a brush is the first treatment. Follow this with a daily application of tincture of iodine, acetic acid, sulphur ointment, or nitrate of mercury ointment. Whitewash barn and premises to destroy the spores scattered by the crusts.

Insects

Flies are a great annoyance to dairy cattle and calves. Cleaning out and hauling away manure daily will destroy the hatching places of flies. Screening barns and using fly repellants gives cows refuge from flies so feeding and milking can be done more easily. Fly traps are being built in connection with some dairy barns. A plan of this may be secured from the Oklahoma Extension Service. Pyrethrum extracts are the leading fly sprays.

Lice are a great annoyance to cattle and must be destroyed to assume good thrift in calves and cows. Spraying with a commercial dip prepared for treatment of lousy cattle is an easy control measure. Repeat this treatment in 15 or 16 days. If a large herd is kept, use this dip in a vat and dip all animals even if no lice are visible. Repeat in 15 to 16 days. Powdered lice remedies may be used in winter but are not as effective as a dip.

Screw worms are very annoying to cattle in the south. If dehorning is done it should not be started in the spring or summer. If screw worms are infecting horn sores or any wound, use chloroform to kill them.

Ox warbles in the backs of cattle are most noticeable in mid-winter and early spring. The warble fly lays eggs in the early summer, depositing them on the hair of the lower legs of cattle. Cattle take in the eggs by licking their fetlocks and places where eggs are deposited. In several months this larva stage of the warble works its way to the back. In the early spring it punctures the hide and drops to the ground.

To control this the grub should be squeezed out of the backs of cattle and then destroyed to stop the cycle of its life. Some favorable results have been reported on spraying the ankles of cattle daily with strong fly repellent to keep the warble fly from depositing her eggs. Walking cows daily through a shallow vat with repellent in it about six to eight inches deep has shown some good results.

DAIRY CATTLE JUDGING

The skill of judging dairy cattle successfully cannot be acquired in a few weeks. Most of the members must study and be trained for months before any actual knowledge of judging is attained. Guessing does not work in judging. Several essentials are necessary to become a good judge.

1. Knowledge of dairy anatomy as well as conformation.
2. Ability to retain mental pictures of individual animals which were seen before.
3. Knowledge of the breeds and their characteristics.
4. Alertness in detecting strong features as well as weakness in cattle.
5. Reasoning power to compare logically one animal with another.
6. Ability to write and give orally a set of strong reasons for judging cattle.

To reach these requirements members should take advantage of every opportunity to watch judges at work. Also to enter judging contests at hand. The study of blue-ribbon animals is very helpful. A large amount of knowledge can be gained from studying pictures of show-ring winners. An excellent practice for members is to visit a breeder of type cattle

and ask him to show his stock and tell the superior points of various individuals. Breeders are glad to do this, and will impress deeply the mind of the learner. All these activities lead to successful dairy judging.

In scoring or judging just one dairy cow or heifer, a ring of four animals, as is customary in judging contests, or an exhibit of many cattle of the same age classification, we follow some general rules:

1. From a distance of 10 feet or more study the general appearance; disregard in part the individual parts of the body, head, legs, and udder and see the animal as a whole. Try to see the size, general carriage, blending of body, head, legs, and udder, and see the animal as a throughout and especially the type each animal presents. Type includes beauty and form and is explained under selection of the dairy cow. Do not make up your mind too quickly on placing the animals, but retain a picture in your mind of each individual seen.
2. Approach the animal from a distance of three or four feet so that the detail points may be studied. Do not forget your first impressions. Unless very good reasons are found on close observation, the first decision should stand.
3. Touch the animal to learn two things: The thickness and mellowness of the hide, which should be handled over the ribs on the side of the barrel. One should be careful and not pull the hide, but merely handle it gently. The next thing to be determined by touch is the quality and health of the udder. A mellow hide and soft, pliable udder denote quality and health. Lumpiness and difference in condition of various quarters are suspicious indications of a diseased udder.
4. Stepping away 10 feet or more for a final conclusion on placing the animals is necessary. Weighing carefully all points, especially general appearance, dairy temperament, mammary system, feed handling capacity, and constitutional strength is necessary to place a class of cows or heifers correctly. Consideration must be given to the fact that dairy temperament or mammary system count much more than either feed handling capacity or constitution. So the relative importance of points as well as considering all points is necessary. After placing of animals is once made and marked on a card, it is unwise to change it after looking again at the ring of animals.

In judging contests it is customary to use four animals of the same sex and practically the same age. The four cows or heifers are lettered at random, A, B, C, D. From a distance the contestants see the animals in motion for about three minutes. Next the animals are placed side by side about seven feet apart, all heading the same way. Here the contestants can study at a distance for three more minutes the rear and front view of the ring of animals. For six more minutes the animals should be lined up in a single file for a side view. While the ring is lined up in this way the final inspection including the handling of the cattle should be completed. At the end of 12 minutes the contestant should hand in his placing card to the one in charge of the contest.

Giving reasons for scoring an animal, judging a ring of four cattle or placing a fair exhibit of a large or small line-up of dairy animals is most important. Breeders want to know why certain cows were blue-ribbon animals and why others were rated lower by the judge. In judging contests it is necessary to give oral reasons and also to write reasons. To do this successfully the contestant should remember the animals judged, but should also make notes, which can be studied till the time comes for giving the reasons. While giving reasons, the notes should be out of sight and the contestant should look squarely at the judge continually. Two minutes are allowed for oral reasons and 15 minutes for written reasons.

Good logical reasons should conform to the following rules:

1. Two animals should be compared at one time. First the top pair, next the middle pair and last the bottom pair. (See model sets of reasons.) Do not speak or write on more than two animals at the same time, unless an unusual individual is discovered.
2. Use comparative terms in telling why one animal excels another. It is not necessary to describe each animal. The comparative terms will indicate to the judge that you have seen the animals. Use terms like these when applicable: A has a larger body than B; C shows more refinement than D; B has a more symmetrical udder than A; B has a larger udder than A; C has a stronger, straighter back than B. Caution: Do not use the word "better" as it is too indefinite.
3. State true conditions and do not try to fool the judge by giving any kind of a reason for placing cattle. This is a common fault in judging contests. Any statement is often given to get through the two minutes of oral reasons.

The greatest fault is to give the same story for each of the three pairs, which of course is untrue. The reason for this is that if an animal is placed under another for a certain reason, this animal cannot be superior in that point and be placed over an animal for the same reason. If a cow is actually superior in any point, say milk secreting system, feed handling capacity or type, this may be mentioned, but contestant must be very sure of this.

4. The greatest point of difference should be mentioned first, or at least early in the set of reasons. The judge may consider only two or three points in which one animal excelled another. So it is folly to give a large number of reasons, when only a few points of difference are really the outstanding factors. In many cases a special point like the front attachment of udder, the refinement of the tail, head, the dishing of the Jersey's face, the depth of chest, the slope of the rump or the carriage of the animal, instead of the broader statements like the milk secreting system, the hump, face, chest or general appearance are most desirable, because these very points might determine the placing of animals. But if there is a wide difference between two animals in one point and less variation in another, the contestant should mention the greater first and closing with the least important difference.
5. Too much criticism on an animal is not good judgment. The judge may place first the animal which the contestant criticizes. So a mild statement is safer when praising an animal over another as well as in telling why the superior animal was placed up in the ring.
6. Do not use indefinite or questionable terms. Avoid terms which are not good dairy terms but belong to other livestock. Slang is not helpful to good reasons. Quote the Dairy Science Card terms when good ordinary language does not express your ideas.
7. Talk forcefully, using good English and persuade the judge to see your way of placing if at all possible.
8. Be courteous and respectful to all during the contest. If you should win, your victory will be sweetened. If you should lose, your courtesy will make the other contestants feel that they would have been glad to see you win.

9. Stand in an erect position when giving reasons, at least five feet from the judge.
10. If the judge asks you a question, answer it courteously and briefly.

Model Set of Reasons

Guernsey Reasons, prepared by Professor Earl Weaver:

My placing on this class is A-D-C-B. I placed A over D because she shows much greater spring of fore-rib and greater width through the chest, D being extremely slack behind the shoulders. A also excels D in that she is considerably deeper and somewhat wider through the barrel; her rear udder is attached higher and wider. A's udder is more nearly balanced than D's. D is seriously criticized for her winged shoulders. But I grant that D does show a longer attachment of fore udder than A. Also, D's milk veins are longer and larger, her udder veins are more prominent, and she is finer at the withers.

I placed D over C because her udder is larger and more capacious than C's. Her teats are more squarely placed, her udder extends much farther forward, and her rear udder attachment is wider. D also is considerably straighter in the rump, neater in the tail setting, and is wider at the pins than C.

However, C is nicer behind the shoulders than D, and her milk veins are more numerous and tortuous.

I placed C over B because she has far more Guerseny character in the head; C has a broader muzzle, a straighter jaw, and more open nostrils, B having a decided Roman nose. C also excels B in having superior teat placement, the rear teats on B hanging too close together. C's milk veins are more numerous and tortuous.

I recognize that B has a straighter back and rump than C; also, she is deeper through the body.

Holstein Reasons

I placed this class of Holstein cows C-D-A-B.

I placed C over D as C shows a stronger back and a nice balance of parts, while D is larger but plainer in the withers and fleshy in the thighs. C has slightly more width of barrel and a bolder spring of ribs, while D has a slightly longer barrel but not as wide as the barrel of C. In the shape of udder I give C the advantage because her udder is held more snugly to her body and shows a nicer balance of quarters, while D has less fully developed forequarters. In quality of udder, C excels D.

I placed D over A on the size of udder. D has a much larger udder, while A is very deficient in size of udder. D also is much more rugged, being a large cow, while A is too small for a desirable Holstein. D excels A because she has a longer, wider and deeper body, while A is lacking in capacity.

I place A over B on shape of udder. A has forequarters which are carried well forward under her body, while B has little development of forequarters. A excels B, having a more typical Holstein head, neck and general appearance, while B is plain. While A is not strong in feed capacity, she still excels B in depth of body, as B is very shallow.

B is placed last because she has a tilted udder, lacks Holstein type and is too shallow in her body.

For these reasons I placed this class of Holstein Cows C-D-A-B.

In judging at fairs the reasons given for placing of large classes should conform closely to the above rules. Even the 10th placing or lower should be logically explained by the judge if farmers or breeders require it.

At national judging contests, the numbers 1, 2, 3, 4 are used instead of the letters.

SHOW FITTING

Fairs and expositions encourage the breeding and feeding of typy cattle. At the ring-side one may study breeds, type, judging, showing, and appreciation of cattle. From a showman's viewpoint, showing at fairs is considered good advertising.

Before fitting animals for the show-ring, the type should be carefully considered. It may be waste of time to fit most animals. Some defects, as a low back, drooping rump, plain head, short neck or shallowness in the chest can seldom be corrected by fitting. These defects, as well as many others, are such that most breeders would not fit animals with such defects for the fair; however, many smaller defects may be remedied by fitting. Such defects as poor condition, tightness of the hide, awkwardness of the animal and the poor blending of parts can be much improved by fitting. In short, fitting is not a cure-all for off-type animals, but enables the showman to exhibit the type animal in an advantageous manner. Many typy animals lose in the show-ring for lack of proper fitting.

Feeding animals properly is the first step in show fitting. Good condition is required in animals on exhibit. The idea

that dairy cows and heifers should be lean and poor is misleading. However, lumps of fat or excessive fleshiness are equally undesirable. Legume hay is essential to fitting calves as well as older dairy stock. This feed develops the middle or barrel of the animals. In general the feeding rules of this animal should be followed. Two or three months before the show this feeding system should be employed. In Jersey fitting, legume hay is used sparingly to keep the withers refined.

Housing show animals for about two months before the fair is a good practice. This protects them from flies, the hot sun, and also it makes the feeding more easily possible and gives the trainer a better chance to fit and train the animal. Burlap bags may be used to cover the windows of the barn and may be hung over the doorway. This darkens the barn to keep flies away. It also helps to keep the barn cool.

Blanketing should be started a month or more before the show. The purpose of a blanket is to smooth the hair and increase the mellowness of the hide. Furthermore, it protects them against flies. Light homemade blankets are satisfactory. Burlap bags, sacks or ordinary blanket material are good for blanketing.

Training the calf or cow to lead well, stop at the desire of the exhibitor, stand squarely on its feet, keep the head erect and the back up takes much time, practice and skill. A well-fitting halter is necessary and a month or more of hard work will accomplish good results. The fact is that many typy animals are not winning prizes because they are poorly trained and do not show to good advantage.

Washing the animal as soon as it is housed and then every two weeks, including the washing one or two days before showing, is essential in proper fitting. Cleanliness is important in showing to the best advantage. Ivory or tar soap may be used. When a good lather has developed, a thorough rinsing is necessary to remove all the soap. After this the animal should be blanketed for several hours. However, Jerseys are seldom washed in fitting.

Grooming the cow or heifer with a soft brush adds to the gloss of the hair and pliability of the hide. Rubbing with the hands vigorously with the grain of the hair is helpful to bring gloss to the hair and mellowness to the hide.

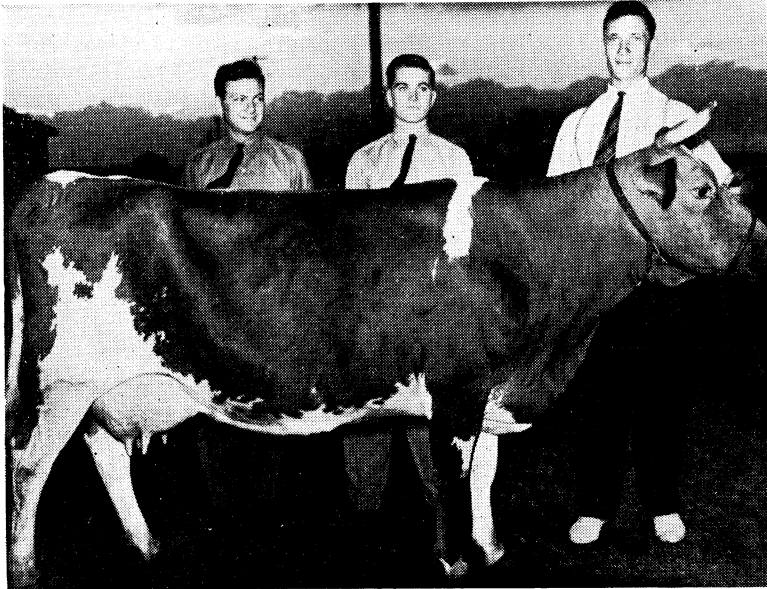
Clipping the heads and tails of calves and heifers is usually sufficient. Cows are clipped on the udder and belly to show the veining system. Clipping should be done a week before showing for best results.

Trimming the feet, very much like horses' hoofs are trimmed, adds greatly to the appearance of show animals. Hoofs may be polished like horns.

Horns properly fitted add greatly to the beauty of dairy animals. With a rasp the roughest places may be filed down. With glass the horns may be made smooth. However, too much filing and scraping may weaken the horn shell and it may be easily knocked off. Sand paper may be applied next to polish the horn. Finally a woolen cloth moistened with olive oil, cottonseed oil or some mineral oil sprinkled with powdered pumice stone should be applied. This gives horns a high polish. This work can be done before coming to the fairs, and only the final polish need be repeated at the show.

In going to the show, it is important to have clean, well disinfected trucks or cars. These should be well-bedded and provided with feed and a barrel or more of water. A show box should be taken into the car or truck. Some articles in the show box should be blankets for cattle and men, knife, towels, soap, the halters, show halters, hammer, saw, nails, tincture of iodine, olive oil, emery paper, pumice cloth for polishing horns, brushes, file, milk fever outfit, spade, buckets, shears, clippers and articles for the men as carried while traveling. While traveling it is best not to overfeed cattle, but give them plenty of water, with light feed. At the fair the stalls should be disinfected, if not taken care of by the show. Bedding the stalls well helps in keeping the stock clean and comfortable. Feeding your own grain and hay and changing gradually to other kinds will be wise, so the animals will eat satisfactorily. However, as the drinking water in strange places is not relished by cattle, an extra amount of salt is fed by some showmen to make the cattle take more water. Before the show the following points should be carefully watched:

1. The animals must be clean and washing must be completed 24 hours before showing.
2. The tails should also be washed and braided, so the braids may be left until just before entering the show ring.
3. Blankets should be left on until entering the show-ring.
4. Brushing and rubbing the hide should be continued.
5. Extra feeding is necessary to improve the middles.
6. Give cattle a drink before entering the show-ring, but not too much or the sides will show unbalanced.



These boys represented Oklahoma at the National Dairy Show in 1939 at San Francisco. They are Kenneth Westfahl, Major county; Jimmie Potts, Washington county; and Merlin Newman, Major county.

7. Unbraid the tail and brush it just before entering the show-ring.
8. Put the show halter on the animal and dress in a white suit when the time is near to enter the ring.

In the ring lead your animal and watch only your animal and the judge. Be on the job, be quiet, and pose your cow or heifer to the best advantage. The four feet of the animal should be squarely placed under the body; the head and back should be up and an alert look in the animal should reflect the work of a wide-awake showman. If time drags, and the judge is at the other end of the ring keep active and show to your best ability till the ribbons are awarded. Finally, be a quiet, meek winner and do not whine if you lose. Afterwards, while the show is still in progress, keep your stock looking well, show it to the visitors and take pride in your exhibit.

TEAM DEMONSTRATIONS

The benefits of the team demonstration are not only showing the value of club work and dairy practices, but it teaches members to think, express themselves and illustrate good

method of dairy work before an audience. This establishes the knowledge firmly in the member's mind, arouses his self-confidence, and teaches him to handle crowds successfully. To do this successfully, a member must be familiar with the subject and must be able to speak well to present the work forcefully, true as to subject matter and in a logical way. At the same time he must show charts and do the thing with his own hands to illustrate his talk. One man said, "All good demonstration teams make me feel that the work is so simple that I could do it easily myself, so interesting as to make me want to do it, while the methods are explained so clearly and completely that when the demonstrators have finished there seem to be no questions unanswered."

For girls the following demonstrations are briefly outlined. As the bulletins and home dairy outlines give more details, the team can write out the demonstration completely, so from 15 to 30 minutes are used in giving the demonstration by two or three members.

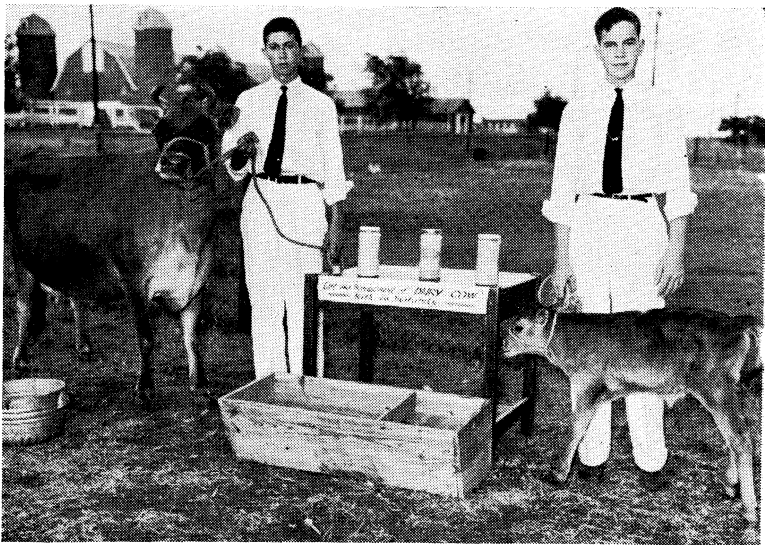
1. Home Butter-making—Farmers' Bulletin 876; Oklahoma Extension Circular 267.



With a demonstration on the manufacturing of dairy products, Katie Lou Adams and Gene Edwards, Garvin county, went to San Francisco in 1939 after placing first in the state contest at Stillwater, and were the national champion group.



Shirley Byram and Dorothy Smith, Beckham county, represented Oklahoma's club members in the National Dairy consumption team demonstration contest at San Francisco in 1939 and were reserve national champion group.



This is the boys' demonstration team that represented Oklahoma at the National Dairy Show in San Francisco in 1939. Their demonstration was the "Feeding and Care of the Milk Cow from Birth to Maturity." They are Robert Nash and Dennis Smith, Jefferson county.

2. Cottage Cheese-making—Farmers' Bulletin 1451; Oklahoma Extension Circular 267.
3. Home Ice Cream-making—Oklahoma Extension Circular 267.
4. Dairy Sanitation—Oklahoma Extension Circular 267.
5. Dairy Dishes.
6. Cottage Cheese Dishes—Farmers' Bulletin 1451.
7. Dairy Drinks.
8. Cream Whipping—Technical Bulletin No. 113, Experiment Station, Geneva, New York.
9. Scoring Dairy Products—Oklahoma Extension Circular 267.
10. Dairy Products sediment test.
11. Yellow Cream Cheese making.
For boys the following demonstrations are suitable:
 1. Dairy Heifer Selection—United States Department of Agriculture Miscellaneous Circular 99; Dairy Science Score Card—Oklahoma Extension Circular 173.
 2. Feed Mixing—Oklahoma Extension Circular 246.
 3. Babcock Testing—Oklahoma Experiment Station Circular 65.
 4. Dairy Record Keeping—Farmers' Bulletin 1446; Oklahoma 4-H Club Dairy Report Blank.
 5. Show Fitting—Oklahoma Extension Circular 173.
 6. Dehorning—Farmers' Bulletin 949.
 7. Care of the Cream Separator—Purdue Experiment Station Bulletin 133, Lafayette, Indiana.
 9. Methylene Blue Test—Vermont Experiment Station Bulletin 264, Burlington, Vermont.
10. Calf Stanchion Construction—Farmers' Bulletin 1336.
11. Treating Calves for Insects—Farmers' Bulletin 1470; Oklahoma Extension Bulletin 173.

MARKETING DAIRY PRODUCTS

In a well-managed dairy as well as a farm dairy, the marketing side is very important. The proper handling of milk and dairy products leads to more successful marketing. The following instructions for cleaning and sterilizing milk utensils have been helpful to many dairy farmers:

To insure good flavors and longer keeping quality for dairy products, more than ordinary care and cleanliness is required. Milk and its products take on odors, flavors and contamination much quicker than most other foods. Really the greatest and most common sources of this contamination are the buckets, cans, separators, crocks, pans, or milk utensils.

Steps in Washing Milk Utensils

1. With cold or lukewarm water remove the milk and other substances from the inside as well as the outside of the utensils. (Hot water will cause milk to "cook on.") This first step will save washing powder and keep the water to be used with the powder clean for a longer period of time.
2. Scrubbing with warm water and washing powder is the next step. A wash brush or preferably a dairy utensil brush is much better than a cloth. It removes the grease and milk and does not spread it. It also reaches the parts of buckets and utensils, that cloth cannot reach.
3. Rinse in warm water.
4. Place in sterilizer and steam for five minutes or more. Do not place lid on cans or assemble the separator till all parts are entirely dry. It is important to have all utensils dry from the effects of the heat in the sterilizer, and no wiping should be necessary.

See Farmers' Bulletin 1473, page 5, for instructions in making a steam sterilizer for farm dairy use.

A chlorine solution may be used instead of steam.

Care of Cream

To have a high quality of cream for home use and for sale, some extra care is necessary.

1. The first requirement is the special cleanliness of all vessels and other objects with which the cream comes in contact. (In addition to the dust blown by winds, other

impurities should be kept out of cream.) Flies are an enemy of milk and dairy products, and should be screened out of the milk house or the room where milk and cream are handled.

2. Cooling cream, and keeping it cool is the second essential in care of cream. To do this effectively, a cooling tank may be made from a vinegar barrel which may hold two or more cans. The barrel may be cut off so it is a little deeper than the height of the cream can. Partitions can be fixed to keep can from turning over. An inlet from the well should be a pipe bent in a way so cold water is brought in near the bottom of the tank. An outlet pipe two inches from the top of the barrel will permit the warmest water to drain to the stock tank. Fresh cream should be kept separately in a can until cool. Then it can be added to the can of cream which is taken to market, or used for butter-making. Cream should be cooled to 60° F. or as near that as possible and held at the temperature to insure proper quality.
3. Stirring cream three times daily hastens the cooling and helps to keep lumps from forming. A metal cream stirrer is most sanitary.
4. Covering the cans, the cooling tank and vessels is important to keep dust and hot sun away, but warm cream should have the lid placed loosely on the can to allow the animal heat to escape.
5. If selling cream, the delivery should be made twice a week in winter and three times per week in summer to deliver it in good condition.

Next comes the actual marketing of the products. Often the good care and most cleanly handling is not the entire secret of securing the highest price for the product. Four marketing channels are open for cream, which is the average man's product on the dairy market: The cream station, the privately owned creamery, direct shipping and the cooperative creamery. The Extension Division of the A. and M. College takes as much interest in marketing as in economical production of dairy products as well as other agricultural products and will assist farmers who will ask for this help through the county agents.

REFERENCES

A. and M. College Dairy Department, Stillwater, Oklahoma.

Circular 60—Silos and Silage.

Bulletin 107—The Babcock Test

Bulletin 156—Commercial Buttermilk

Bulletin 177—Kafir and Cane Silage for Dairy Cattle

Extension Service, A. and M. College, Stillwater, Oklahoma.

Bulletin No. 311—Feeding Cows for Milk Production

United States Department of Agriculture, Washington, D. C.

A Farmers' Bulletins

1069 Tuberculosis in Livestock

1214 Farm Dairy Houses

1336 Feeding and Management of Dairy Calves

1342 Dairy Barn Construction

1359 Milk and Its Uses in the Home

1443 Dairy Cattle Breeds

1604 Dairy Herd Improvement Associations

1470 Management of Dairy Cattle

1532 Dairy Herd Improvement

1536 Infectious Abortion of Cattle

1626 Feeding Dairy Cows

B Department Bulletin

1769 Judging Dairy Cattle.

