

Guidelines for managing

LARGE DAIRY HERDS

B-1132

in Texas



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GUIDELINES FOR MANAGING LARGE DAIRY HERDS IN TEXAS

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Texas Agricultural Extension Service
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GUIDELINES FOR MANAGING LARGE DAIRY HERDS IN TEXAS

INTRODUCTION

The trend toward fewer but larger dairy herds in Texas is predicted to continue. However, a large size business is no guarantee of success in dairying. The addition of more cows, land, labor, and capital puts a premium on management if success is to be obtained. Dairymen with expansion experience report that a larger business often complicates rather than simplifies management. Despite the problems and risks associated with operating a larger dairy farm, many dairymen will expand to maintain or increase their incomes. The experience of dairymen who are successfully managing large herds can help future large herd operators avoid many of the pitfalls associated with a large business.

In the spring of 1971, the *authors* (Wells and Parsons) traveled to the southwestern United States and California to observe and record successful management practices being used in selected large herds. Herds were visited in Dallas, Ft. Worth, and El Paso, Texas; Phoenix, Arizona; San Bernardino, Riverside, Tulare and Visalia, California. Herds visited ranged from 200 to 2,400 cows per farm. Over the years in these areas, large dairy herds have developed that are often heavily dependent upon purchased feedstuffs. The competition for land for alternative uses and the high cost of irrigation water has curtailed forage production on many dairy farms. A drylot type of operation has evolved in which high rates of milk production and labor efficiency are keys to success. These "milk factories" specialize in handling and managing large numbers of cows. Annual herd averages of 17,000 to 20,000 lbs. of milk per cow are not uncommon in these herds. During the last two decades, chaotic marketing conditions and rising production costs have weeded out many inefficient farms. The remaining farms, regarded by some as the most efficient in the United States, have carefully selected and developed those management techniques that work in large herds. Despite differences in climate, topography, and sources of feed, these proven techniques are adaptable to any large herd regardless of its location. Keep in mind that many of these guidelines are adaptable to small and medium size herds as well.

The purposes of this circular are to:

1. Present a brief picture of major management concepts used in successfully managed large herds and,
2. Provide suggested management guidelines for Texas dairymen to consider in the broad areas of:

- * Dairy Facilities
 - * The Milking Herd
 - * The Replacement Herd
 - * Labor Management
- Business Practices

For more detailed information on the principles and techniques presented in this publication, the Texas Agricultural Extension Service, through its Extension Dairy Science and Agri-Economist sections, is prepared to further assist dairymen. A list of additional dairy related publications is presented in the list of publications.

DAIRY FACILITIES

The goals of work simplification and economical construction should be blended together in planning dairy facilities. New facilities should provide a level of comfort, convenience, and safety comparable to industrial employment if dairymen are to attract and keep qualified employees. Cows and materials must be handled in volume through mechanized milking, feeding and waste disposal systems. Traffic and feed alleys should be designed to promote quick and easy movement of cattle and materials.

Western Dairying

On many of the farms the authors visited, the milking parlor-office complex is the center of activity. Pens or corrals are easily visible from the centrally located milking parlor-office complex. Although some stanchion milking barns were observed, the trend is toward elevated milking parlors. Wash pens and automatic crowd gates are used to make milking easy. Traffic and feed alleys are not cluttered by gates or other obstructions. Cows can be moved quickly to the parlor. Self-unloading wagons or trucks are driven along feed bunks to distribute rations.

On some farms, lock-up stanchions are being incorporated into fence-line feeding systems to restrain cows for pregnancy tests. Concrete is used for all traffic lanes and other areas where cows congregate, such as feeding platforms, waterers, etc. Newer facilities use water to flush traffic lanes and holding areas free from manure. The slurry is collected in storage tanks or lagoons and later irrigated onto adjacent fields. An entirely satisfactory method of waste disposal has not been developed in the area. Minimum shelter is provided cows because of low rainfall and favorable temperatures. Shades are provided to shelter cows from summer sunshine and winter rains. Low rainfall makes it possible to use minimum amounts of bedding in corrals. The following section provides guidelines for designing dairy layouts for Texas farms. Despite concepts used by large herd operators in the west are adjusted to fit Texas conditions.

Management Guidelines

A drive-through layout for group handling of cows in a free-stall milking parlor system is discussed below. Such a system consists of seven major areas: 1) loafing area (free stalls), 2) feed area, 3) milking area, 4) paved lot, 5) manure area,

6) treatment or veterinary area, and 7) maternity area (see Figure 1).

● Include a free-stall area.

This type layout consists of a single line of stalls opening directly onto a paved lot with a roof extending 4 feet past the stalls for weather protection. One stall for each cow housed, plus one additional stall for each 10 cows is recommended. Southern or eastern exposure is preferred, but a western exposure is satisfactory if stalls face another line of stalls across the lot which serve as a windbreak. Single line stalls are economical to build and easy to maintain. The size of the animal determines the length and width of stalls. For the larger breeds, stalls should be approximately 7 feet - 7½ feet long (outside curb) and 48 inches wide. For smaller breeds, 6 feet - 6½ feet long (outside curb) and 42 to 46 inches wide should be satisfactory.

● Include a feed area.

With the drive-through feed alley, silage, hay and grain can be fed very efficiently outside in covered fence-line feed bunks with or without stanchions. Stanchions are recommended for some layouts. The following guidelines should be considered when building a drive-through feeding arrangement with covered feed bunks:

A 6-7-foot overhanging roof is necessary to shelter feed manger and cows while eating.

The feed manger should be approximately 30 inches wide and at least 16 inches deep.

Allow 24 to 30 inches of manger space per cow.

Drive through feed alley should be approximately 12 to 14 feet wide. A dirt drive is satisfactory if the feed alley is covered. A paved feed alley is desirable.

Drinking water should be available to cows at all times. Water cups or tanks should be located near the feeding area, but not in the loafing area. One automatic drinking cup will take care of 20 to 25 cows.

● Include a milking area (with holding pen).

Locate milking parlor on a well-drained site, convenient and accessible to driveway.

Select parlor to fit needs but allow for possible expansion. Plan for an office in milking parlor for centralized record keeping.

Design parlor for maximum efficiency without overlooking comfort of milkers and "good" milking practices. Low milk lines are recommended.

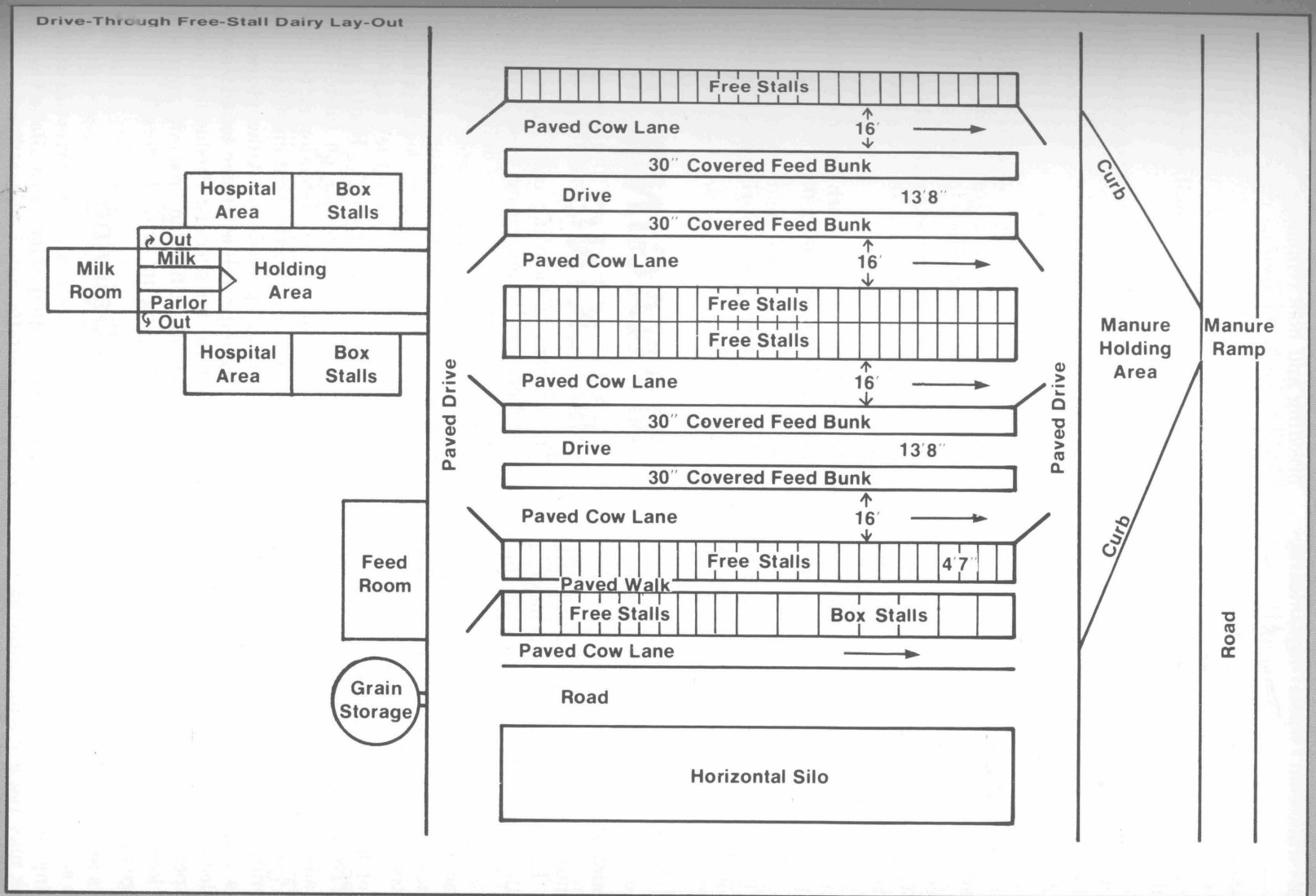


Figure 1.

Drive-Through Free-Stall Dairy Layout

A drive-through layout facilitates group handling of cows in a free-stall milking parlor system. The system consists of 7 major areas: 1) loading area (free stalls); 2) feed area; 3) milking area; 4) paved lot; 5) manure area; 6) veterinary area; and 7) maternity area.

Do not drain milkroom waste into nearby streams.

Holding pen should be long and narrow—15-20 square feet per cow. The size of the holding pen should be related to size of herd, facilities for grouping and total milking time. These factors should be considered in planning so cows will not spend too much time in this area. Area should be paved and well drained (slope 1 inch per 4 feet). Covering is recommended for the pen.

- **Include a Paved Lot.**

Allow for paved area of 75 to 100 square feet per cow plus dirt lot. Access to dirt lots is a must to help prevent sore feet. For paved area, a 4 inch concrete slab over a firm clay base or stone fill is satisfactory (sloped from ¼ inch to ½ inch per foot. With a flush system a 3 to 4% slope is recommended). The lot should be designed to provide good drainage. Investment in a concrete paved lot and driveways on both ends of the layout is essential in order to facilitate movement of feed, cows, and manure.

- **Include a manure area.**

Handling manure has been the major difficulty with free-stall housing. Good management is required to handle sloppy manure. Some guidelines follow:

Manure can be scraped into a storage area or pit and then loaded with a front-end loader. This system is not satisfactory during rainy periods.

Where slope of land permits, build a ramp so that manure can be pushed directly into a spreader. A flail type spreader or conventional spreader with a special end gate can be used for handling manure. Adjacent temporary storage, which might be an extension of the ramp or an area on the sides, should be provided on the basis of 1.5 cubic feet of manure per cow per day. A retaining wall at least 2 feet high will keep the manure confined to the temporary storage area.

Some operators are using liquid manure systems where manure is scraped or flushed into a holding tank for spreading on the fields. Liquid manure handling systems may require substantial investment in concrete, pumps, pipes and spreading wagons.

- **Include treatment or veterinary area.**

This area is necessary for veterinary treatment, such as blood testing, udder clipping, artificial

breeding and hoof trimming. A gate arrangement to hold, catch, or confine cows as they leave the milking parlor is a time saving asset in a dairy operation. Other suggestions include:

Provide one treatment stall for every 20 cows in the herd.

The most desirable width for treatment stalls is 2½ feet.

- **Include a maternity area.**

A maternity area is necessary to prevent sudden exposure of newborn calves during cold, wet weather. Other suggestions include:

Confine expectant cows to well-bedded, sanitized calving stalls or pens 24 to 48 hours prior to freshing.

Provide one pen for each 20 cows. Maternity pens should contain 140 sq. ft.

A small pasture lot near buildings makes a desirable maternity area during nice weather.

MANAGING THE MILKING HERD

The concept of handling cows in large groups and systematically managing them is the central theme in the care of the large milking herd. New feeding systems are being adapted which combine the principles of labor efficiency and adequate grain intake to maintain high levels of milk production. Low breeding efficiency is a major problem in large herd management. Herd expansion, mechanization and emphasis on labor efficiency have made adequate heat detection more difficult. Heat detection is a practice that must be as routine as the milking procedure. Although cows are handled in groups, full attention to individual cow records is vital for success. Production, breeding, health and identification records provide the means of "keeping up" with the details.

Western Dairying

Rations for western dairy cattle are based primarily upon high quality baled alfalfa hay. A shift to feeding alfalfa cubes and silage is underway since they are more readily adapted to mechanical handling. Forage is supplemented with concentrates and a variety of by-products such as prunes, cottonseed, and bakery products. Many western U.S. dairies have abandoned the practice of feeding each cow individually. Cows are grouped according to age, size, or speed of milking. Dairy men who

formerly grouped cows according to production have abandoned this practice because of the number of cows that must be changed each month. Dairy-men reported using "group fed" rations without a significant loss in production. All the grain is fed to the cows in the feed bunk. Feeding a complete blended feed is a new approach. All of the ingredients fed to the animal, including grains and rough-ages, are mixed together.

Many dairymen in this area have well trained herdsmen, professional technicians or veterinarians to do their breeding and sterility work. Routine heat detection and the systematic use of breeding and health records are considered essential to a successful breeding program by all dairymen.

An Arizona dairyman's comments about herd records typifies the prevailing attitude of large herd managers about this key area of management: "A lot of dairymen say the reason I can do this (keep accurate herd records) is because I've got money! I say, if I have got money, then this (herd records) is the reason. You can't convince me that a person can get the most out of his operation without good records. Everything is built around that record system."

Most of the farms visited had developed systems for quickly locating and identifying individual cows. Because of their daily use, health, breeding, production and identification records are centrally located in the dairy office. The California Mastitis Test (CMT) is highly regarded as a management tool for the prevention and control of mastitis. Teat dipping is widely used in mastitis prevention programs.

Management Guidelines

The following guidelines are offered for consideration in developing a management program for the milking herd. The results of some recent research pertaining to feeding high producing dairy cows is presented as a basis for the feeding recommendations which follows.

FEEDING

The milking parlor system has made milking easier, but has also placed a limitation on the amount of grain a high producing cow can eat while in the parlor. Data from Michigan State University indicate that when concentrates are fed only in the parlor and grain consumption is limited to a maximum of 20-22 lbs. per day, very few cows will peak above 70 lbs. of milk per day, unless other methods of increasing concentrate consumption are used.

A California experiment compared the persistency and feed conversion efficiency of cows with high, medium, and low production potential. Cows in the high production potential group had 305-day mature equivalent records of 20,000 pounds of milk or more. All cows were individually housed and fed a high-energy blended ration consisting of 40% alfalfa hay and 60% concentrate. No concentrates were fed in the milking parlor. Table 1 summarizes the results of 3 years of experimental work.

All cows in these groups had free-choice access to the same ration during the trial. High producing cows averaged more dry matter intake than medium

Table 1. Performance of Cows Fed a Free-Choice Mixed Ration of 40% Chopped Alfalfa Hay and 60% Concentrate

Item	Production Group		
	High	Medium	Low
Milk (lb./308 days)	24,241	15,310	10,054
Fat (%)	2.9	3.0	3.2
Fat (lb./308 days)	706	455	320
Dry matter intake (% of body wt.)	3.13	2.45	2.24
Body weight (lb.)	1,434	1,446	1,391
Change in body weight (lb.)	+106	+74	+130
Lb. milk/lb. feed	1.88	1.49	1.16
Energy efficiency (%)			
Total	42.1	33.9	26.7
Above maintenance	61.3	55.5	48.8

Source: Tenth Annual Dairy Cattle Day, Spring 1971, Dept. of Animal Science, University of California, Davis.

and low-producing cows. Average body weight and weight gains were similar for each of the groups. Even though they consumed more feed, the high producers yielded 1.88 lbs. of milk per pound of feed compared to 1.49 and 1.16 lbs. for the medium and low-producing groups, respectively. The high group converted 42.1% of its metabolizable energy intake into milk energy compared to only 33.9% and 26.7% for the medium and low groups, respectively. Similar differences were observed in energy efficiencies above maintenance requirements. Restricting feed intake to less than free-choice had no significant effect on efficiency of milk production within the productive levels studied. Cows within each group produced the same amount of milk per pound of feed intake whether they were fed free-choice or were restricted to approximately 90% of their free-choice intake.

Results of this experiment are the basis for the concept of feeding all cows in a herd for high production and culling those that do not perform well. All cows are fed the same ration and are not individually fed according to production. How much a cow eats is governed by her productive potential and appetite.

● Handle cows in groups.

Group cows in separate lots for an entire lactation according to speed of milking, age, and size.

Feed concentrates within each group according to expected levels of production. The entire grain ration is fed outside by a self-unloading wagon, grain wagon or mechanically by augers. This system can eliminate parlor feeding and allow the milker to concentrate on milking.

Many of the dairymen the authors visited discontinued grouping cows according to production because too many cows were moved each month with disruptive effects on production. Here are some of their comments: "I tried putting my cows in three groups—high level, over 70 lbs. of milk; medium level, 50-70 lbs.; low group, under 50 lbs. I just had too many cows dropping off too fast in their production when they were changed among these kinds of groups. I feel cows adjust their appetites when they start falling off in milk production."

"We grouped according to production, but discontinued that because our cows dropped off in production too fast when moved to another group. I have four corrals. The first consists of first calf heifers. The second corral contains 2nd and 3rd calf heifers and older cows with good udders and sound feet. The third corral contains cows with average udders and slower milkers. The fourth

corral contains mostly older cows with large udders. Cows stay in the same corral the whole lactation."

● Group cows in a single lot for an entire lactation.

Feed roughage and all concentrates outside according to the expected level of milk production for the herd. The arrangement of many dairy layouts makes it difficult to handle more than one group and still allow cows to have access to all the necessary areas for silage, hay, water, free-stalls, and milking parlor. Studies indicate that the entire lactating herd can be fed as one group without severe production losses. This involves feeding some cows at a higher level than is required to support milk production and maintenance in late lactation. Studies seem to indicate that the efficiency of adding body fat during the latter part of lactation is greater for the lactating cow than for the dry cow. When grouping cows in a single lot for an entire lactation, feeding complete blended feed rations will also work satisfactorily. Blended rations are made by mixing roughages and concentrates together in balanced proportions prior to feeding. In this manner, the relative amounts of different rations are fed mechanically by auger or self-unloading wagon.

● Supplement parlor feeding with outside grain feeding.

Commonly a basic amount of grain, 8-12 lbs., is fed outside. In addition, high-producers are fed all they can eat while in the parlor. This system does not completely meet the requirements of the highest producers and requires handling concentrates separately at two locations. Therefore, as the size of herd increases and changes are made in housing facilities, it would be wise for dairymen to provide facilities for group handling of cows housed in a free-stall system, and a elevated stall milking parlor. A desirable layout for dairymen to consider would be a drive through or fence-line system for feeding roughages and grain outside.

MILKING MANAGEMENT

● Use a mastitis screening program.

Some local DHIA's offer a leucocyte count as an optional service. The test is invaluable since it indicates the udder health of each cow. The test can also help evaluate: 1) the proper functioning of the milking system, 2) milking techniques, 3) the probability of mastitis flareups before they become serious, 4) the progress of the mastitis control program in use, and 5) the effectiveness of the dry-cow treatment program.

A Californian using a screening program commented, "I feel that it (screening test) is one of the most worthwhile things we do outside of the breeding and feeding of our cows. Our production seems to hold a lot better. I have had as high as 93% negative cows in our herd of 2,200 cows. Our milkers are real interested in how their strings tested out."

- **Dip teats after milking.**

Dipping teats in an effective teat dip after milking is a good way to reduce the incidence of udder infection. Some dairies are using spray nozzle applicators to apply teat dip in an effort to speed up the milking procedure. The teat dip removes the film of milk which provides nutrients for bacterial growth and leaves a film of sanitizer on the teats between milkings. Satisfactory teat dip preparations contain a high iodine concentration of 5,000 to 10,000 ppm but a low phosphoric acid content. A high phosphoric acid content will result in teat irritation. Before using an iodine compound for teat dipping, be sure it is recommended as a teat dip.

- **Properly train milkers.**

The Department of Agricultural Information Visual Aids Section, Film Library offers an excellent slide set for upgrading the knowledge and milking skills of employers and employees. *Better Milking-Better Milk*, No. 775, is available in English and in Spanish.

IDENTIFICATION AND LOCATION

- **Use ear tags and neck chains.**

Large herd operators suggest that both ear tags and neck chains be used together. Ear tags are difficult to read in elevated milking parlors and neck chains are difficult to read when cattle are eating. Ear tags are available which are easy to read from the front or back of the animal. Tags like Lone Star or Ritchey tags are fastened to the lower part of the ear. The Cattle Identification Badge or tip-up tag is fastened to the top of the ear. These tags are numbered on both sides (Figure 2).

- **Use neck chains for special purposes.**

Vary the tag color to correspond to different pens or groups of cows. Use different tag colors to identify a milker's string of cows. Some dairymen use colored wire attached to neck chains to denote the cow's breeding status, etc.

- **Keep a tag book.**

List each animal's permanent tattoo number, vaccination tag, ear tag, and neck chain together

in a tag inventory book. This listing makes it easier to replace lost tags and chains. Large herd managers stress the importance of keeping records current if the system is to work.

- **Keep a location book.**

A location book lists individual cows and the groups or pens to which they are assigned. The importance of a location book in large herds is illustrated by the following example. A large herd is divided into several groups. A periodic pregnancy check is to be made by a veterinarian. The herdsman checks his breeding records, identifies the cows needing examination and then locates them by using his location book. Without a knowledge of a cow's location, considerable time is spent in each group trying to find the right cows.

- **Use a location board.**

A cow location board can be centrally located in the office or milking barn. The board should be divided into sections corresponding to pens or groups of cows. Colored tags corresponding to neck chain numbers are hung on hooks on the board. These tags can be made of wood, plastic or metal. Tags are hung in numerical sequence within each section of the board. A blackboard placed next to the location board can be used to leave messages about individual cows. For example, cow G-56 in pen 1 is to be bred. Cow J-86 was observed in heat. The herdsman can look up J-86's record to determine if she is ready to breed. Figure 3 illustrates a simple cow location board.

HEAT DETECTION

- **Make all employees responsible for heat detection.**

Continual visual inspection for heat is essential to a successful breeding program. On farms with large herds, the herdsman, feeder, and milkers usually have this responsibility. Make provisions for heat detection when regularly assigned persons have a day off, etc.

- **Observe cows several times a day.**

Cows in large western herds are observed as often as five times daily by employees—at the two milkings, two feedings and in the evening. An evening observation pays big dividends since cows are more likely to show heat at this time of day, particularly during the summer. Allow sufficient time for observation (20-30 minutes).

- **Take daily inventories.**

The detection of cows in heat is enhanced since

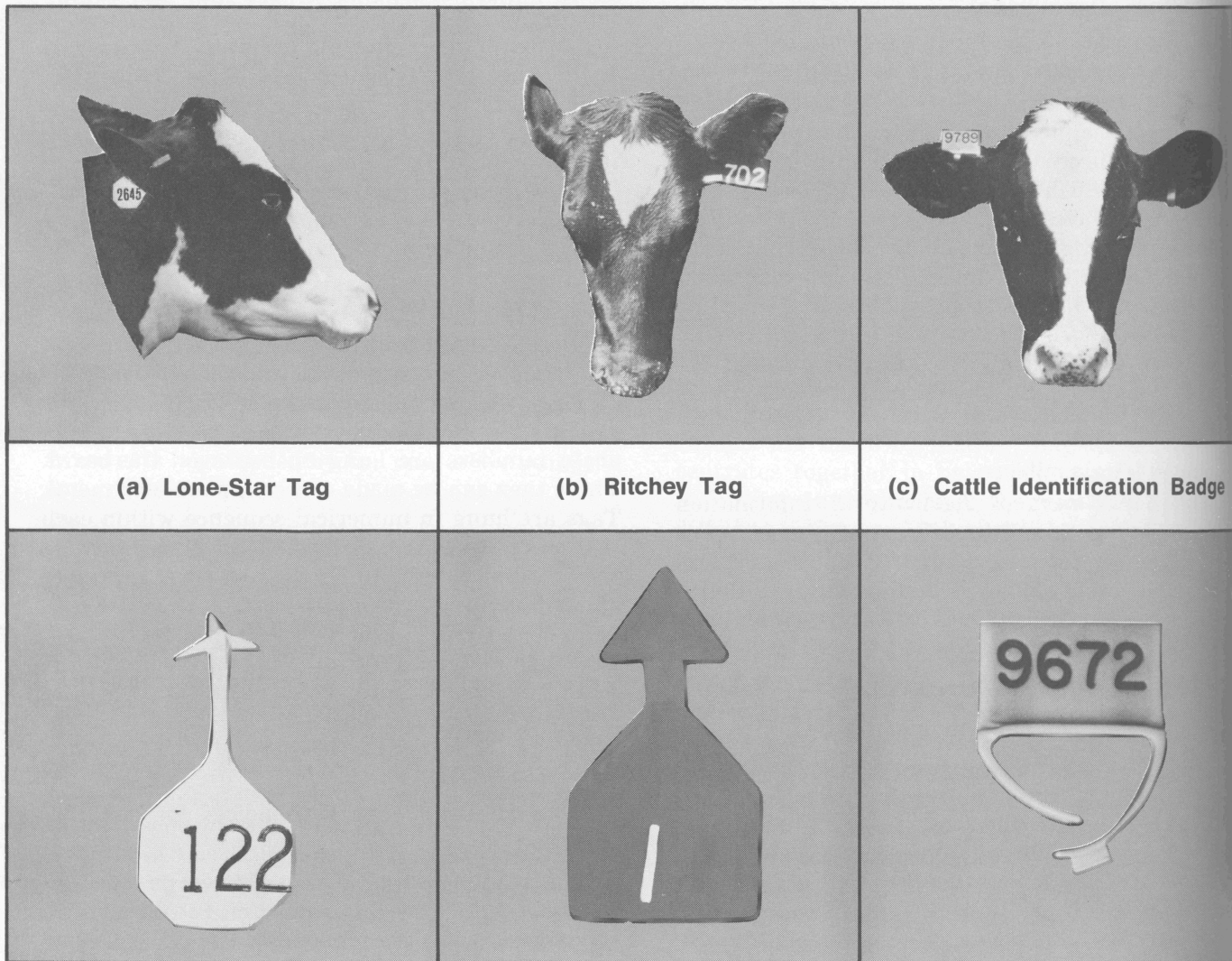


Figure 2.

Easily Visible Ear Tags

Animals should be easy to identify. Ear tags mounted at the top or bottom of the ear aid in quick identification.

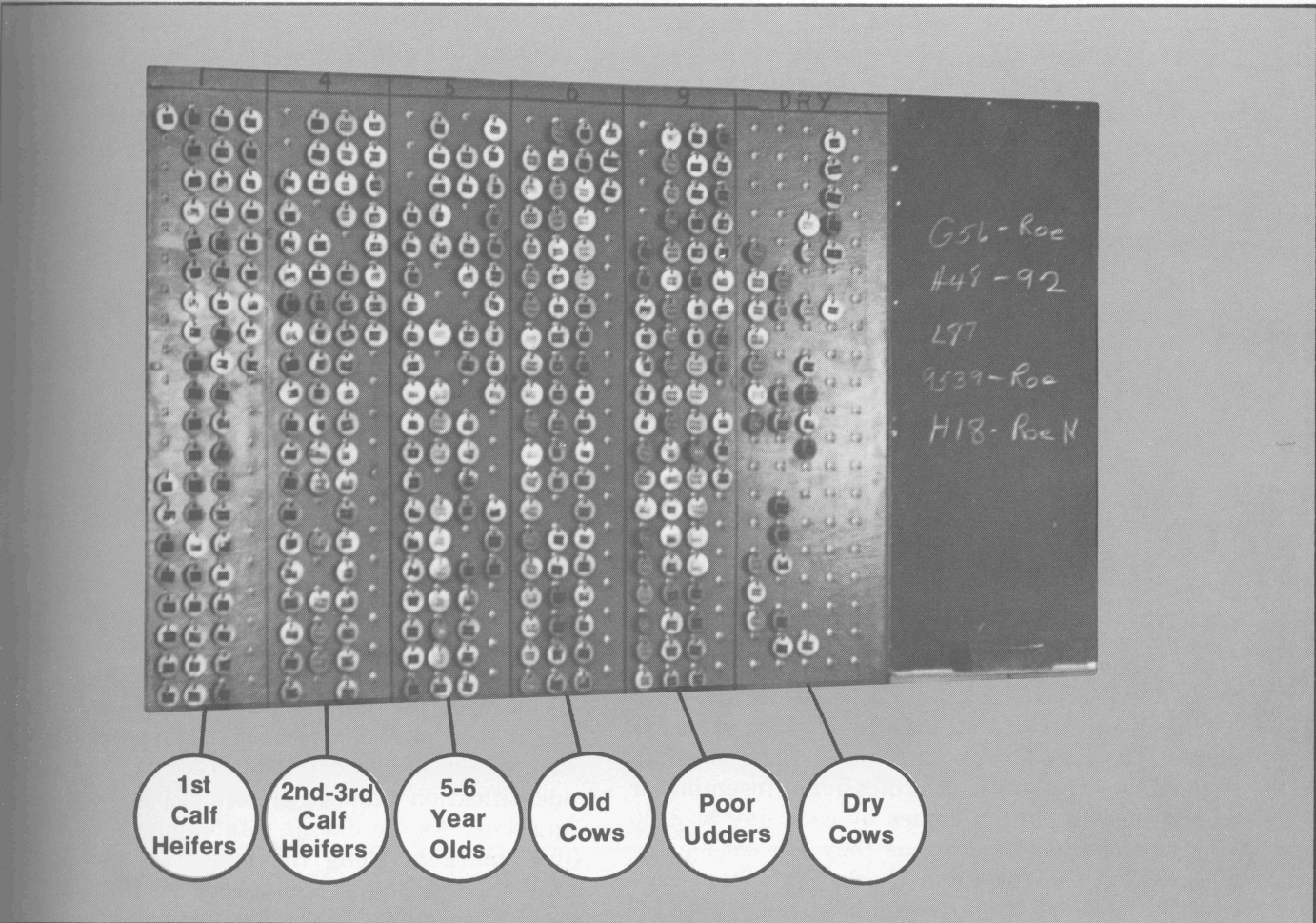


Figure 3.

Cow Location Board

Locating cows quickly aids in timely management. This location board was kept by an Arizona dairyman in his office. Colored identification numbers, one for each cow, are hung on hooks on the board. The board is subdivided into sections corresponding to pens or groups of cows. The blackboard on the right serves as a message center.

the inventory requires all animals be observed as they are counted.

- **Keep heat records—Prepare a heat expectancy list.**

A heat record assists in visually sizing up the reproductive status of cows in a herd. Heat records, as shown in Figure 4, are an integral part of individual cow breeding records. The heat record assists in preparing a heat expectancy list. *The heat expectancy list contains the identification number and location of fresh cows and those bred within the previous 2-3 months that should be observed closely for signs of heat* (Figure 5).

- **Use commercial heat detection devices.**

The device is pasted on the cow's back ahead of the tailhead. Upon being mounted by another cow, the detector's white chemical is activated by the pressure. The red dye that is released is easy to see. Some dairymen use commercial heat detection devices on problem cows or on all cows fresh 60 days or more (Figure 6). Commercial heat detection devices are aids in heat detection. They do not replace daily visual inspection.

- **Use the chalk mark system.**

A California dairyman stated that he used the chalk system of detecting heat. He marks the tailheads of all cows with a red all-weather livestock marking crayon. He stated, "We study our cows outside by using lockup stanchions. Each morning we feed hay and grain. A professional inseminator who is on our payroll comes by each day at 8:00 a.m. and checks the cows as they are eating. He goes behind the cows and checks each and every cow that looks as if the crayon has been rubbed off or has other possible heat signs. Then he asks the assistant who is on the golf cart in front of the cows to check the cow's record. The golf cart is loaded with a liquid nitrogen semen tank, a file card breeding record system, insemination supplies and miscellaneous treatment supplies. After the cow is bred, her tailhead is remarked with red crayon. If the mark is rubbed off again, he rebreeds the cow and the assistant herdsman records the date bred on the individual cow record. The artificial inseminator also checks for pregnancy. Cows which are diagnosed pregnant are marked with green crayon." Dairymen using this system state the system forces them to observe all cows. With this system, cows are still visually observed for heat at all times of the day. Chronic bullers should be treated or removed if the system is to work. The dairyman who marks only a few cows is defeating

the purpose of the system, that is, observing all cows. Figure 7 illustrates the system.

- **Consider other heat detection techniques.**

Hold fresh cows or other cows which need to be bred in lots near the farm office or milking center where they can be more easily observed.

Provide a separate holding area for cows in heat. These cows should be separated from the rest of the herd to avoid injuries due to "riding."

Keep a man in pens 6 hours each day. His sole responsibility is to look for cows in heat. This procedure is practical only in large herds.

HERD RECORDS

- **Keep milk production records.**

The usefulness of milk production records is well documented. The popular DHIA computerized records provide individual cow production information, make grain feeding recommendations and list the cow's reproductive status. Supplemental management lists are available with the DHIA computer record system.

- **Use a cow calendar.**

Commercially made cow calendars or gestation tabulators are means of keeping track of a herd's current reproductive status (Figure 8). The current date or freshening date is located at the 12 o'clock position on the calendar. The central disc is divided into 365 segments, each segment representing one day. A colored tab containing the cow's identification number is fastened on the freshening date. As the disc is rotated one segment each day, markers along the margin of the calendar provide breeding guidelines for the dairyman. For example, the 30-day marker after calving reminds the dairyman to examine the cow's reproductive tract. The 60-day marker reminds the dairyman the cow is ready for her first breeding.

Similar reminders are provided for pregnancy diagnosis, drying-off, etc. These highly visible breeding aids can be used for herds of up to 400 cows. However, since the calendar only keeps temporary breeding records for the current year, it must be supplemented with permanent lifetime breeding and health records.

- **Keep individual lifetime breeding and health records.**

The lifetime breeding and health record presented in Figure 9 can be used to quickly size up a cow or herd's reproductive status. The individual cow card is kept in a filing cabinet or special card

DATE FRESH	Cow #	1ST HEAT	2 nd HEAT	3 rd HEAT	4 th HEAT	5 th HEAT	REMARKS
3-28	63	4-8	4-26	5-14	Bred		
3-29	66	5-4					Treated 4-28
4-3	62	4-10	4-16	4-28	5-21		Cystic, treated 4-28
4-3	71	4-15	5-4	5-25	Bred		
5-5	70						
5-5	77						

Figure 4.

Heat Record

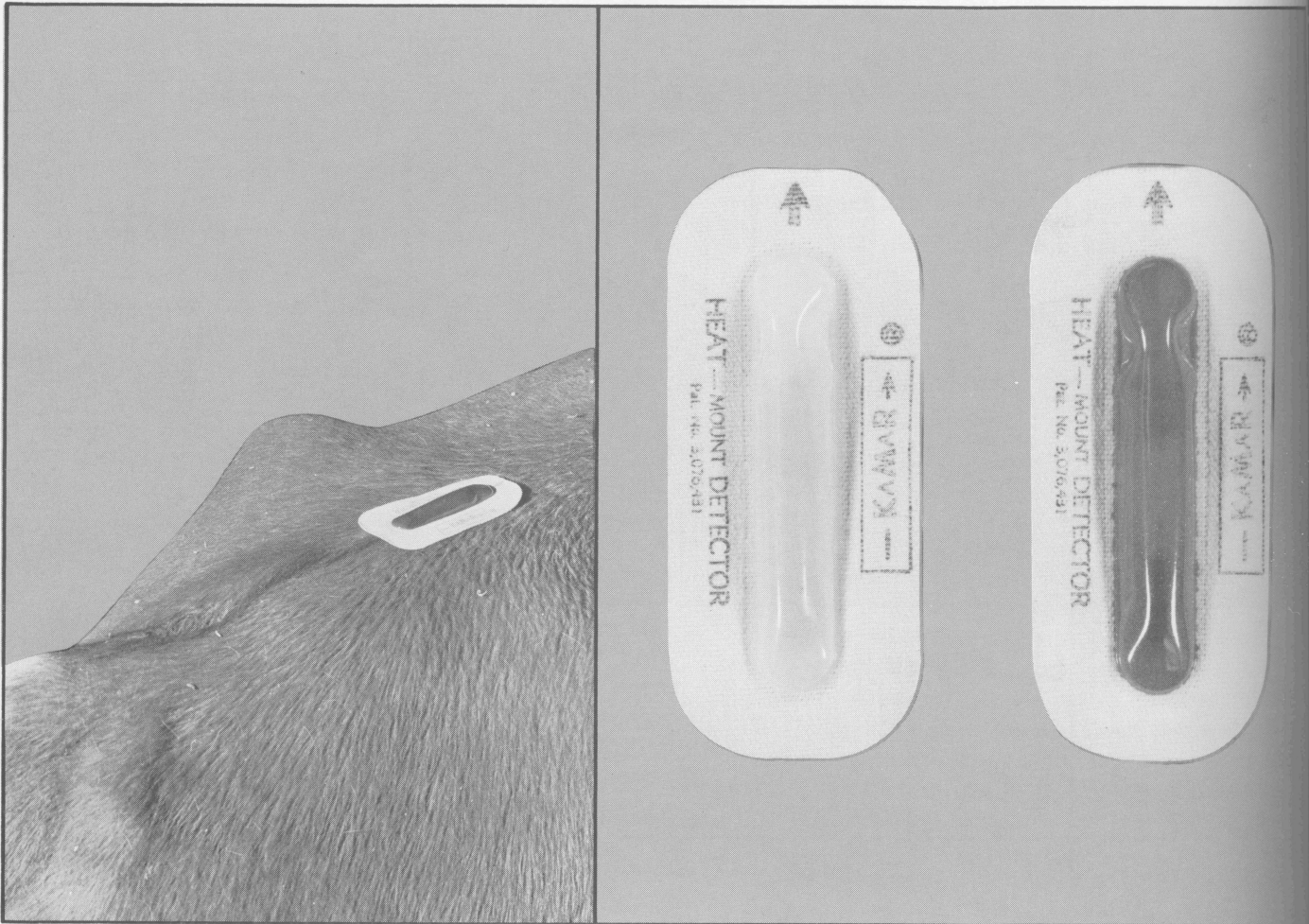
Heat records are an integral part of individual breeding records. Heat records assist in quickly evaluating the reproductive status of cows. The heat record can be used in preparing a heat expectancy list.

WEEK OF MAY 26		
Cow #	Hot #	Comment
63	1	Last heat 5-14
66	1	Last heat 5-14
70	3	
77	3	
62	4	Treated for cystic ovaries 4-28; Heat 5-21 Watch closely

Figure 5.

Heat Expectancy List

This list alerts the dairyman to closely watch cows most likely to come in heat during the current week. This list is easily developed from the individual cow breeding records.



—Photos courtesy of Hoard's Dairyman

Figure 6.

Commercial Heat Detection Device

The left-hand photo shows the device mounted between the hooks of a cow. The detector contains a dye which is released after pressure has been applied. The bright red color makes it easy to see if there has been riding activity. The right-hand photo shows an unactivated and activated detector.

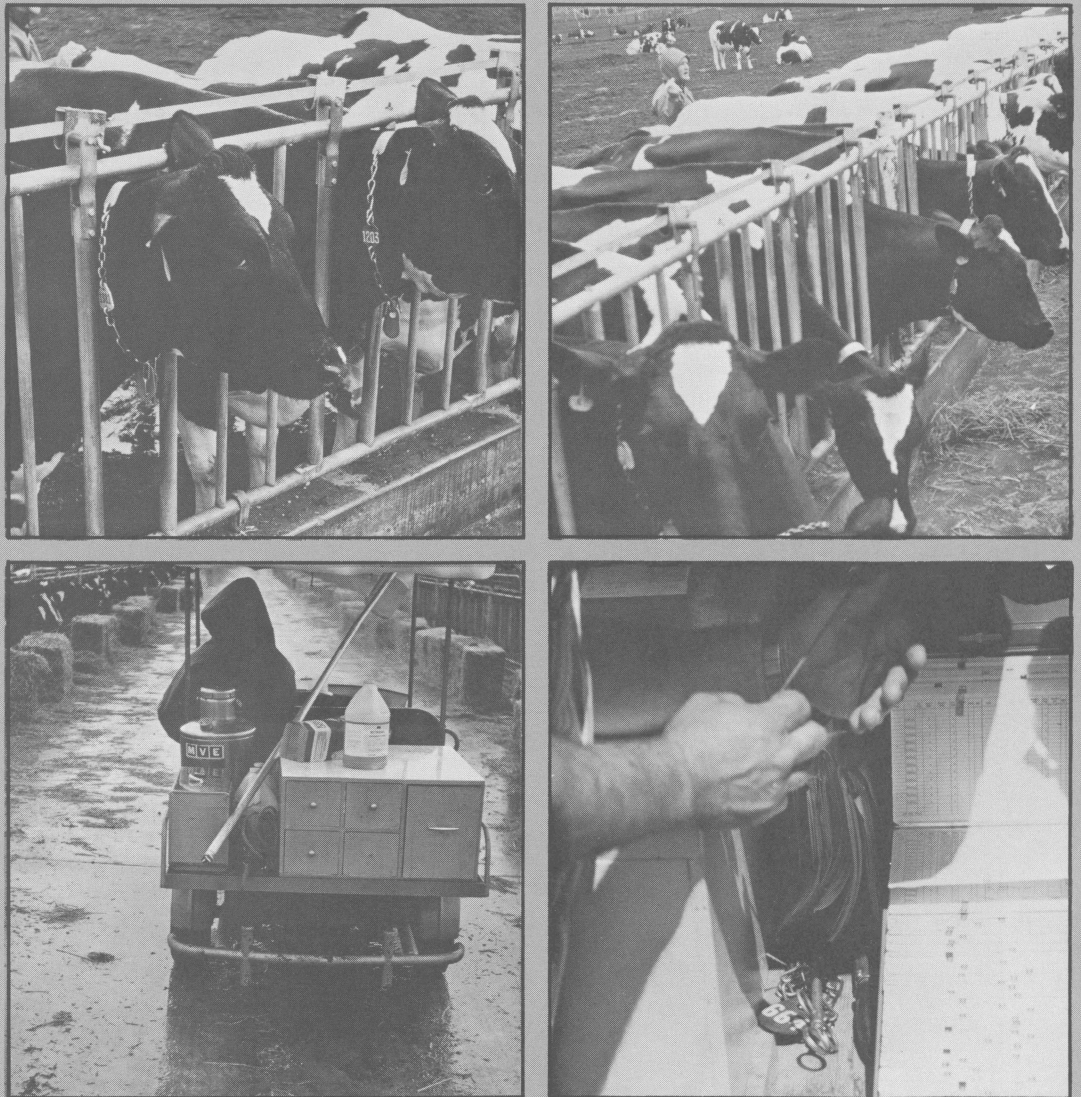


Figure 7.

The Chalk System of Heat Detection

This is a relatively new method of heat detection in California.

- a. Cows are locked up in stanchions each day. All cows are marked on the tailhead with a red all-weather livestock marking crayon.
- b. Each morning the dairyman walks behind his cows looking for cows with the chalk mark rubbed off and/or exhibiting possible signs of heat.
- c. A golf cart equipped with a liquid nitrogen tank, breeding records, insemination and treatment supplies is operated by an assistant.
- d. The assistant reviews the cow's breeding card and records breeding data on it. Inseminated cows are re-marked with red crayon by the dairyman. Cows which are pregnant are marked with a green crayon.

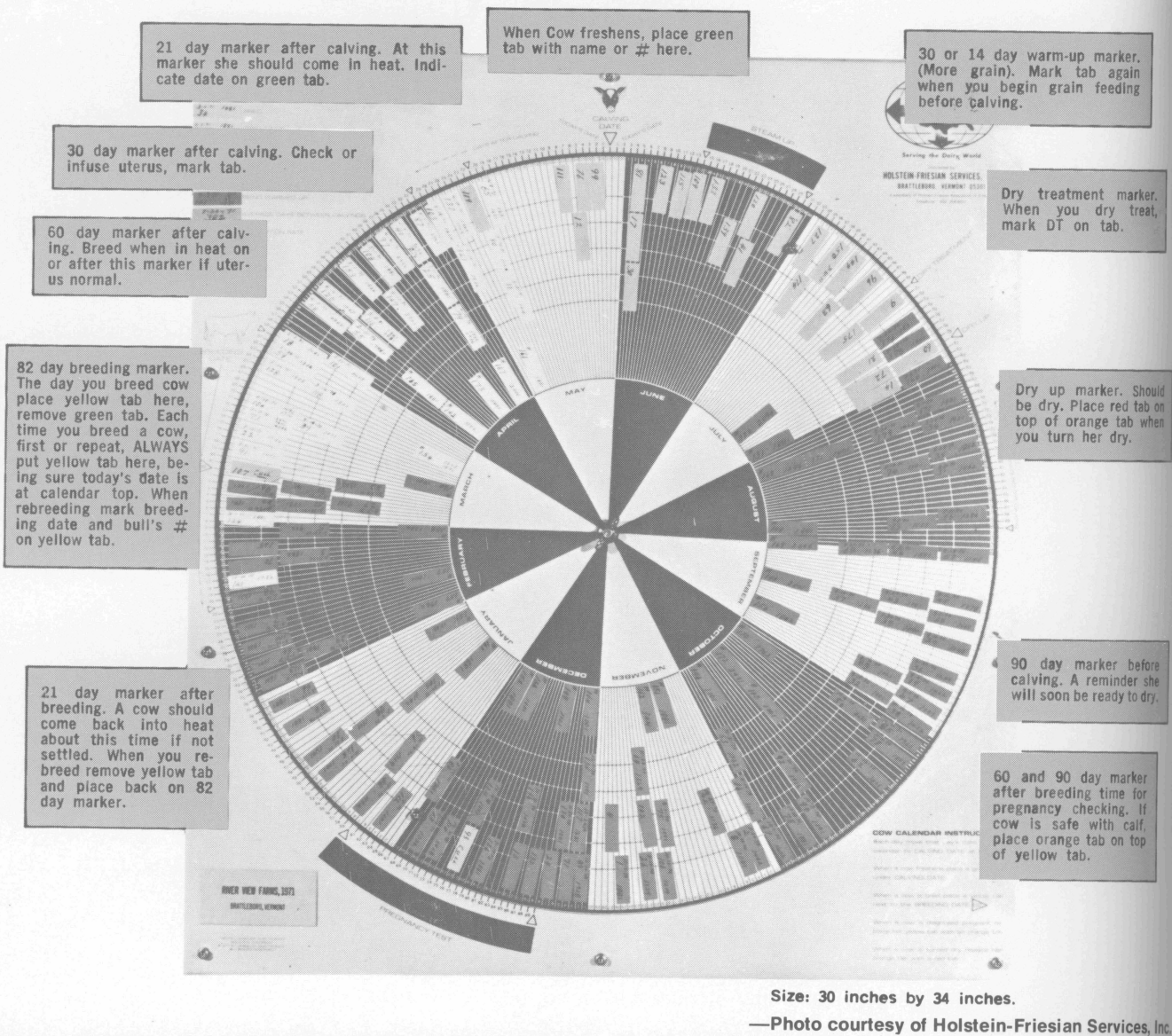


Figure 8.

Cow Calendar

This commercially made breeding record makes it possible to quickly review the herd's current reproductive status. A colored tab containing the cow's identification number is fastened on the central disc. As the disc is rotated, markers along the margin provide breeding guidelines for the dairyman.

holder designed for them.

The dairyman records the cow's identification number, her birth date, and keeps lifetime information about her breeding and health status on the card. The calendar at the top of the card is used to indicate her current status during the year. Colored metal tabs are attached to the card to indicate the cow's reproductive status:

Red	— Problem cows. Placed in upper right corner.
Green	— Fresh cows not bred. Placed on month of calving.
Yellow	— Cows being bred. Placed on month bred.
Black	— Cows pregnant. Placed on month to be dried off.
Blue	— Month due to calve.
Orange	— Cow to be culled; do not breed. Place in upper right corner.

The dairyman can file cards according to how cows are grouped. Regularly, he records all pertinent data on individual cow cards and rearranges the plastic tabs according to the cow's reproductive status.

Here is how the card system can be used. Assume the herdsman is looking at the cards on July 1. He notes a wide array of colored tabs as he opens his filing cabinet. This morning, he is going to prepare his heat detection list and dry-off list. He knows that cows which were bred in May and June will have yellow tabs on the May and June slots on their card. These cows should be observed for heat in July. Fresh cows need to be observed for heat too—they have green tabs. He quickly locates these cards, writes down the cow numbers and the pens the cows are located in. This information is passed along to the employees responsible for heat detection. Two cards have red tabs in the upper right corner. These cows are problem breeders—no sign of heat—and are added to the heat detection list. Fifteen records have black tabs on the slot. The herdsman writes down the cows' numbers and location. Milkers are informed that these cows are to be dried-off.

The card system enables the dairyman to plan his work systematically and minimizes oversights which can be costly. A cow's complete lifetime history is available at one's fingertips. The card system provides continuous management while DHIA records are being processed and provide a backstop if data are incorrectly reported on the computer records.

RECORDS FOR SPECIAL MANAGEMENT PROBLEMS

On certain occasions, "extra" records or reports may be needed to prevent or overcome herd problems. The following records and reports were observed in herds the authors visited.

● Keep an insemination report.

A separate sheet listing cow numbers, date bred, service number, sire number and semen vial number is kept on a daily basis. One dairyman reported problems in settling his cows to a particular bull. A bad batch of semen was the culprit for poor breeding efficiency in another case. Records were able to pinpoint the problem. Some farms also list the inseminator's initial on this sheet and calculate his percentage of conceptions on first service.

Individual inseminators may be motivated to do a better job of breeding because their percentages are compared with other inseminators' percentages. One operator is using insemination records to conduct an experiment to provide him with management guidelines. Each inseminator records the time of day the cow was bred and the status of the reproductive tract, for example, night bred, right time to breed, too late, etc. The purpose of this supplementary record is to improve breeding efficiency.

● Keep a Mastitis treatment report

A blackboard located in the milking parlor lists the cow's number, the quarter treated, and when the cow was treated. The purpose of this record is to keep milk contaminated by antibiotics out of the milk tank. A dairyman risks losing his market if his milk is tested at the plant and is discovered to have antibiotics present.

● Keep a dry-up and calving list

This list is developed on a regular basis by reviewing the individual breeding and health records discussed above. Information is made available to milkers and others who carry out the assigned task of drying off cows and moving springers to a maternity pen or barn where they can receive closer attention.

● Keep a daily or weekly treatment list.

The list is developed on a regular basis by reviewing the individual breeding and health records discussed above. The dairyman lists the cow's number, location, and the nature of the problem. Timely treatment can save many a cow from the cull list and also reduce veterinarian bills.

● Use daily reports.

Daily maintenance reports can be used to assure that machinery and facilities are serviced on a regular basis. The purpose of such a report is to reduce costly repairs. In addition, the operator can develop a list of special projects which deserve attention during the week. In many cases, such a

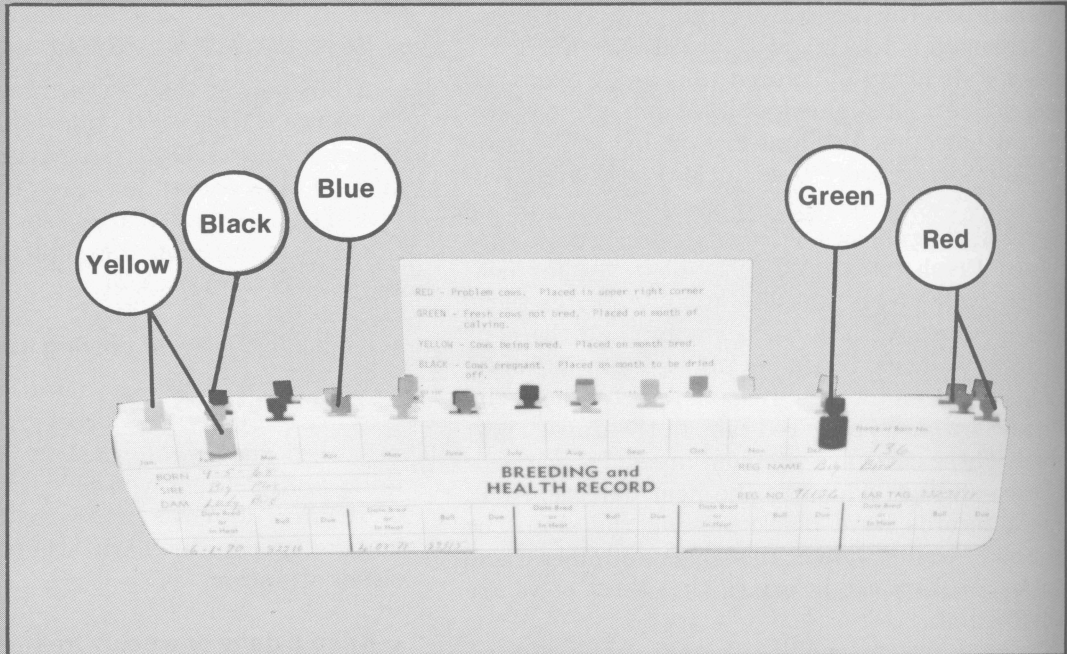
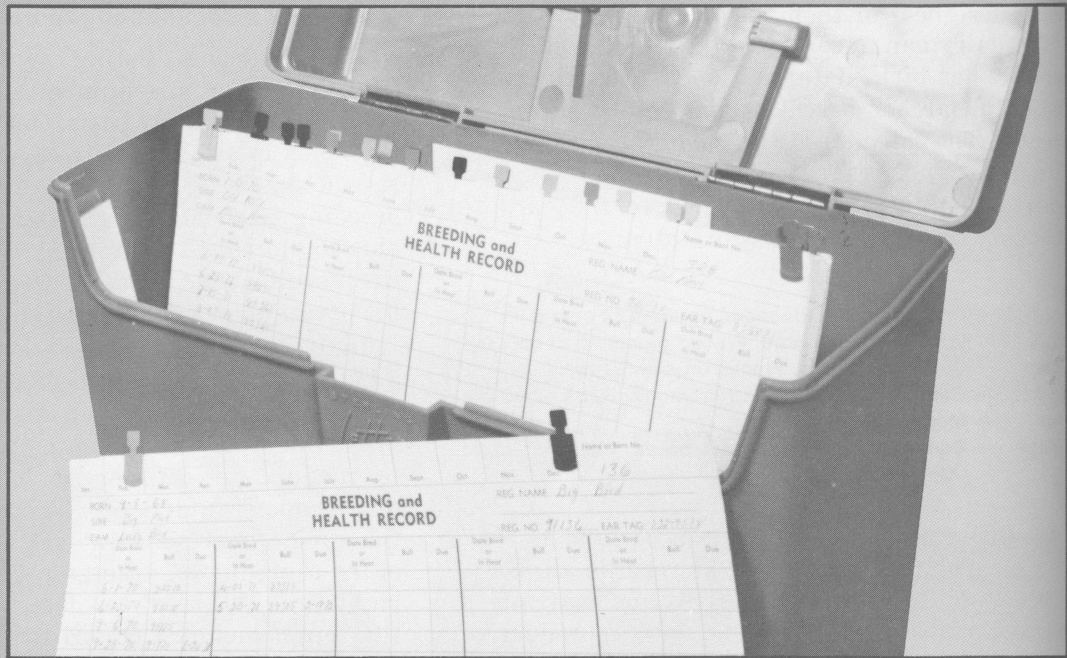


Figure 9.

Lifetime Breeding and Health Records

a. Individual cow cards are kept in a filing cabinet. The dairyman keeps lifetime breeding and health information on each cow's card. Colored metal tabs are attached to a calendar on the upper margin of each card to indicate the cow's current reproductive status. The tabs enable the dairymen to quickly size up a herd's reproductive status.

b. A red tab indicates a problem cow; green—fresh cows not bred; yellow—cows being bred; black—pregnant cows; blue—cows due to calve.

special list can keep employees occupied when planned work is delayed because of weather or a breakdown. For example, calf pens can be cleaned or fencing repaired during an unforeseen delay.

Other dairymen use daily feed records listing the kind of feed and quantity fed. Managers need this information to maintain balanced rations and to monitor feed costs.

VETERINARY PROGRAM

Veterinary practices on a dairy farm must be done at the proper time, at the proper place, and in a coordinated manner. This will insure the dairyman the maximum profit and most efficient use of veterinary service. The most important single factor responsible for the rapid recovery of a sick animal is early veterinary diagnosis and treatment.

Most of the larger dairymen in the western part of the U.S. use a veterinarian regularly. Many have a veterinarian on retainer, paying them so much per month, and the veterinarian visits the herds daily, or weekly depending on the size of the herds.

A dairyman in Anthony, New Mexico stated, "The primary use of the vet on my farm is not so much doctoring cows, but breeding. If I can increase my fertility rate 1 or 2%, it is money well spent." Another dairyman in Phoenix, Arizona states he not only used a vet for treating cows, but also as a consultant.

• Cooperate with veterinarian.

The full cooperation of the dairyman and veterinarian is required for a smoothly functioning herd health program.

• Provide facilities for treatment of animals.

• Use an effective disease prevention and control program.

Such a program meets the needs and requirements of the individual farm. This type program can be best accomplished by the veterinarian making regular visits (daily, monthly, or weekly) to the farm at a mutually convenient time.

Prior to arrival, the owner should notify the veterinarian as to the exact nature and quantity of services to be performed. This will enable the veterinarian to allow plenty of time for the work to be done. Then veterinary work can be carried out in a more efficient organized way, resulting in a saving to the dairyman. At this time, the dairyman and veterinarian should also discuss important management practices that are helpful in preventing and controlling disease.

MANAGING THE REPLACEMENT HERD

Raising replacements must be viewed as a vital part of a successful herd management program. Many dairymen consider calf raising an irritating chore which should be finished as quickly as possible. Yet, a herd can make considerable genetic progress through its replacement heifers if proper sires are used. Genetic progress significantly influences future milk production and income.

Western Dairying

Western U.S. dairymen cite the replacement program as one of their major trouble spots. Calf mortality runs as high as 25-30% annually in some herds. In many of the herds the authors visited, however, mortality was less than 4% annually. In recent years the supply of high-quality replacement cows available for purchase has decreased. More emphasis is being placed upon raising replacements. A few dairymen start their own calves and then contract to have them grown out by an experienced person. In large herds, calf raising has become specialized to the extent that one person has this as a full time responsibility.

Faced with historically heavy calf mortality rates, western U.S. dairymen have placed heavy emphasis on providing optimum environments for the baby calf. Rigorous sanitation and immunization programs have been implemented. In some cases, controlled environment calf barns are being used. This innovation suggests the importance with which calf raising is viewed. Typically, baby calves are started in individual pens until weaning. After weaning, calves are handled in groups. The progress of individual calves within each group can be quickly measured by complete identification and record systems that are used. Western dairymen can grow out large vigorous heifers because high quality forage, usually alfalfa hay, is constantly available to them.

Management Guidelines

The following management guidelines should be considered in developing a sound replacement program.

THE DRY COW

- **Provide a 6- to 8-week dry period.**
- **Provide a good quality forage free choice.**

Cows should be fed 1 lb. of grain daily per 100 lbs. of body weight 2 to 3 weeks prior to parturition. If the roughage is of a poor quality, grain will need to be fed throughout the dry period.
- **Provide free-choice trace mineralized salt and minerals such as defluorinated rock phosphate or dicalcium phosphate.**

If the milking herd is being fed a blended ration, the same ration can be fed to dry cows.
- **Inject each cow, just prior to calving, with 1 to 1.5 million units of vitamin A if you detect deficiencies.**
- **Provide a draft-free, clean, well-bedded place for calving, or a clean pasture area during good weather.**
- **Check cow periodically and be prepared to render assistance.**

THE YOUNG CALF

- **Paint the naval cord with a 7% iodine solution.**
- **Nurse calf within 30 minutes of birth.**
- **Separate calf from dam after first day.**
- **Feed colostrum for the first 3 days.**

A Texas dairyman stated, "The average dairyman doesn't realize the importance of colostrum. We are suffering real losses in our calves during the first few days of life because we get lax about it. We keep colostrum feeding records to avoid slip-ups. A card is attached to each calf pen. One side is marked 'first feed' at the top and 'second feed' at the bottom; the other side is marked 'third feed' at the top and 'fourth feed' at the bottom and so on. The card is rotated so the current feeding is at the top. A separate card marked 'quart' can be used to assure that a calf with scours is fed only one quart of milk."

- **Maintain high sanitation standards.**
- **Keep calves dry and free from draft.**
- **Sanitize calf feeding utensils after each feeding.**
- **Feed a good quality milk replacer.**
- **Provide plenty of fresh, clean water at all times.**
- **Provide a calf starter during the first week ad lib**

Such starters should contain at least 75% total digestible nutrients (TDN) and 18-20% crude protein. Add vitamin A and D, if necessary, to supply 2,000 units of A and 500 units of D per pound of feed.

- **Provide iodized salt or trace mineralized salt.**

Salt can be added to the starter mix (1%) or fed free-choice.
- **Identify all new born calves.**

A metal ear tag accompanied by a tattoo is commonly used. Tag numbers are listed in a tag book in the event the tag is lost and also recorded on the calf's record. After the calf is assigned a permanent herd number, a cattle identification badge, Ritchey, or Lone Star tag can be used for identification. These tags are particularly suitable for calves handled in groups since they can be read without catching the calf (See Figure 2, p. 8).
- **Keep calf records.**

In large herds, a calf raiser may start several hundred calves a year. Since timeliness is important in calf raising, calf records can play an important role in the replacement program. The following record was used in a 2,400 cow herd where calf mortality is less than 5% annually (Figure 10).

Immunization data is recorded on the calf record. The notation "S" refers to a regular immunization the calf receives when she is less than a week old. The notation "BS" refers to a booster shot administered when the calf is 12 days old.

Calves are grouped at 10 days of age and move through 3 pens during the first 7 weeks of life. Immunizations are timed to coincide with moves from one pen to another. Pen moves are checked off and the immunization is recorded—a double-check that all calves are treated. At a later date, the calf's immunization record is transferred to an individual cow record (health and breeding record).

- **Provide clean, dry, draft-free housing for young calves.**

Buildings facing south are most satisfactory. Open front calf barns should have three tight sides to eliminate drafts. Individual calf pens are most commonly used for raising young calves. These pens permit the herdsman to observe each calf as he cares for it. Individual pens provide a means of keeping the calf dry and clean with a minimum amount of bedding. Pens can be moved without dismantling and can be adapted to a variety of buildings. Individual calf pens can be built on the farm or purchased commercially. The elevated slatted floor calf pen is relatively new.

No bedding is used. These pens permit manure to drop below the pen where it is removed manually or by flushing with water. Slats are

Date Born	Sex	Dam	Sire	Ear Tag	Immunization	Pin # 123	Wean	
4-19-71	F	1007	090	398	S	BS	VVV	6-19-71
4-20-71	F	550	090	399	S	BS	VVV	6-19-71
4-21-71	M	311	206		S	BS	VVV	6-20-71
4-21-71	F	699	090	400	S	BS	VVV	6-20-71

Figure 10.

Calf Record

Calf records play an important role in the replacement program. Birth dates, sire and dam identification numbers, ear tag number and immunization records are important components of the record. This data can later be transferred to the animal's permanent lifetime cow record.

made of wood or metal and where used in open-front buildings, bedding is required to minimize drafts. Partitions for individual pens can be solid, slatted or made of woven wire or hardware cloth panels (Figure 11).

- Wean calves when they are consuming 1½ lbs. of good starter per day.

THE CALF FROM WEANING TO 6 MONTHS

- Handle weaned calves in groups.

Limit the spread in age to 2 to 3 months within each group. Age grouping assures that younger calves are not crowded away from feed by older, larger calves. Move calves that gain at a faster rate than their group to the next pen of older calves.

- Use ear tags as management aids.

A dairyman the authors visited uses small colored ear tags—one color for each month—to identify a calf's month of birth. Since this dairyman groups his calves after weaning, he can look at a calf's colored ear tag to determine whether her growth rate is satisfactory. A calf that is doing poorly is reassigned to another group of calves of similar size.

- Construct facilities allowing easy feeding, cleaning, and observation.

The system suggested is a fenceline feeding

concept. A minimum of 25 sq. ft. per heifer is required if the feed manger and water are located outside on a concrete area. Heifers up to six months of age require 1 foot of manger space (Figure 12).

- Provide fresh water at all times.

If automatic water bowls are used, provide one bowl per 25 head. Keep water bowls clean.

- Start internal parasite control program at 5 months of age.

The preferred compounds are tetramisol and thiabendazole. Follow label instructions in administering these drugs. Your veterinarian can conduct a fecal egg count to determine how well your parasite control program is working.

- Vaccinate replacement heifers against brucellosis only if the disease is a current problem in the herd or immediate area.

If animals are vaccinated with strain 19 brucellosis vaccine, it should be done at 3 to 5 months of age by a veterinarian. Vaccination against blackleg and malignant edema is advisable in some herds. Consult your local veterinarian who is familiar with the disease situation in the area concerning these practices.

Figure 11.

Individual Calf Pen

Individual calf pens can be built or purchased commercially. They provide a means of keeping the calf dry and clean with a minimum of bedding and labor. These pens permit the dairyman to observe each calf as he cares for it.



THE HEIFER FROM 6 TO 9 MONTHS

- **Provide free-choice hay and silage.**
Heifers this age cannot make satisfactory growth on forage or pasture alone.
- **Feed grain during this stage of development to insure sufficient protein and energy.**
A grain ration containing 14 to 16% crude protein should be used. The amount of grain depends on the amount and quality of roughage fed. From 3 to 6 lbs. of grain daily during this stage of development is generally recommended. The important thing is to keep heifers growing and developing according to a normal growth scale.
- **Provide at least 30 sq. ft. of housing space per head.**

THE HEIFER FROM 9 TO 15 MONTHS OF AGE

- **Provide adequate amounts of quality forage.**
These heifers will generally do well if fed sufficient quantities of high quality forage.

- **Provide supplementary feed for average pastures.**
The 700-lb. heifer requires 9 lbs. of TDN and 1 lb. of digestible protein daily to maintain normal growth. Most of our permanent pasture will not supply these amounts of nutrients during the summer. Feed 4 to 6 lbs. of the milking herds' grain mix per head daily.
- **Supply salt and minerals.**
Some may be in the grain mixture, but free-choice feeding is also recommended. The salt may be either trace mineralized or iodized.
- **Maintain calcium-phosphorus ratio of 2 to 1.**
- **Breed heifers by size.**
Holstein and Brown Swiss heifers should weigh 750-800 lbs. Ayrshire and Guernsey heifers 600-700 lbs., and Jersey heifers 550-600 lbs.
- **Allow a minimum of 35 sq. ft. housing space per head if heifers are confined.**

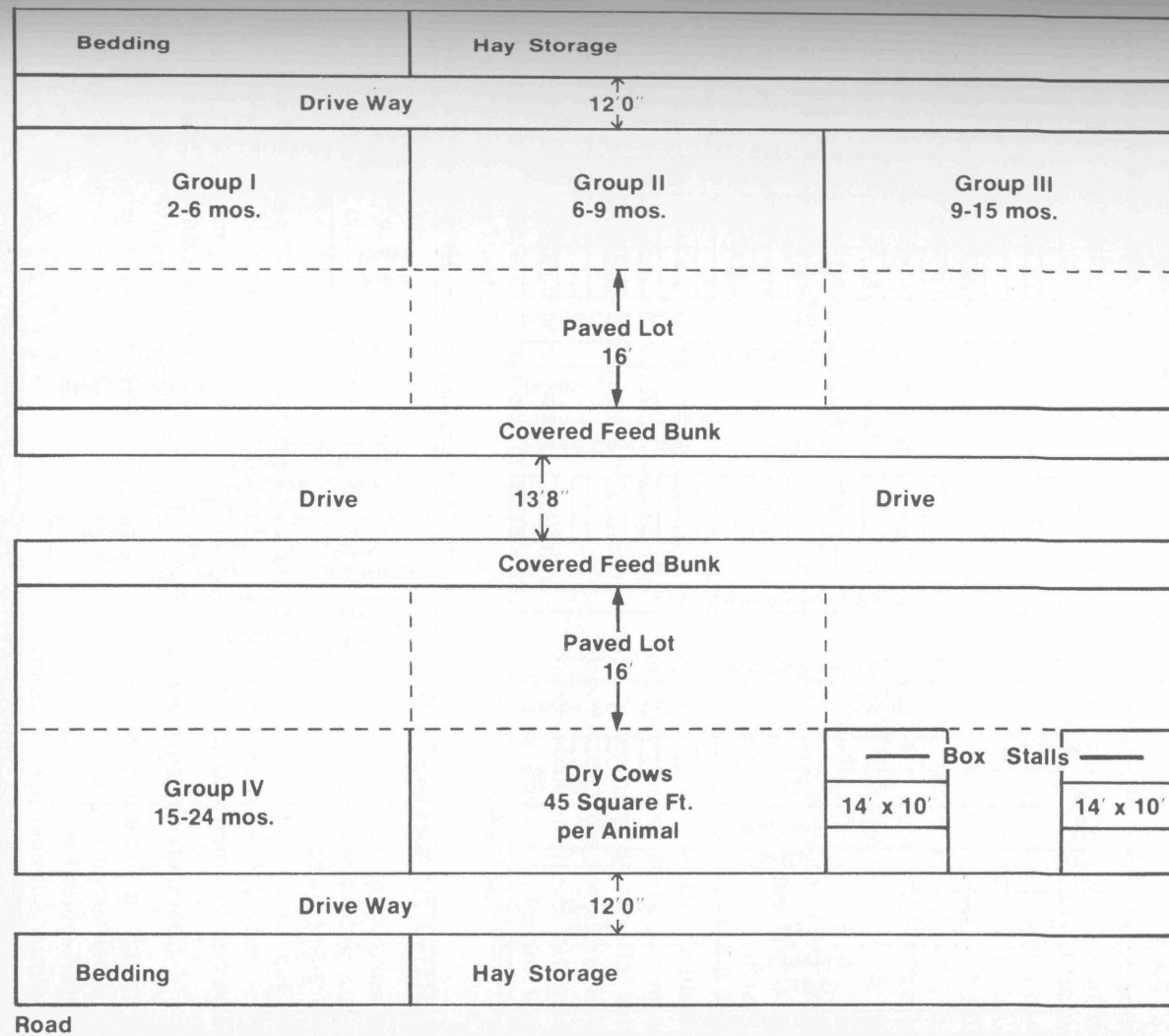


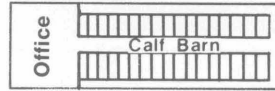
Figure 12.

Drive-Through Feeding and Housing Layout for Young Stock From Two to Twenty-Four Months of Age.

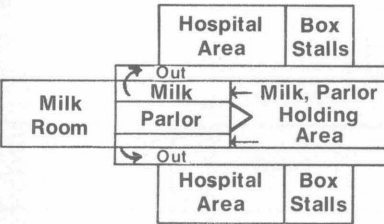
This layout consists of an open front building, paved lot, bedding and hay storage, box stalls and a section for dry cows. It is designed to handle heifers in groups. Housing based on:

2-6 mos	25 square feet per animal
6-9 mos	30 square feet per animal
9-15 mos	35 square feet per animal
15-24 mos	40 square feet per animal
Dry cows	45 square feet per animal
Box stalls	140 square feet per animal

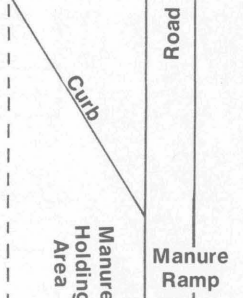
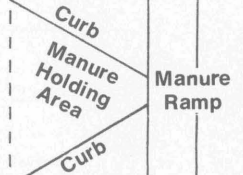
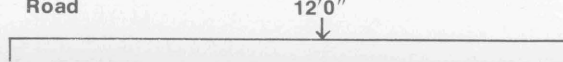
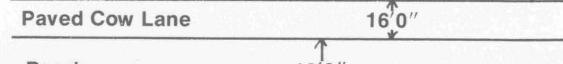
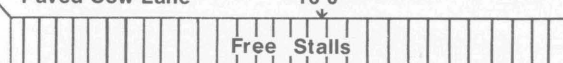
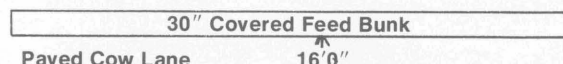
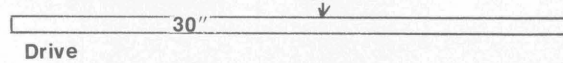
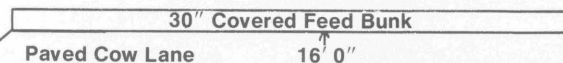
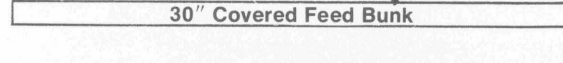
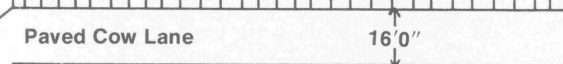
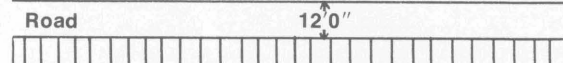
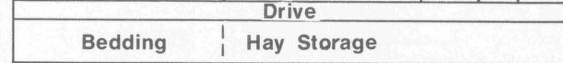
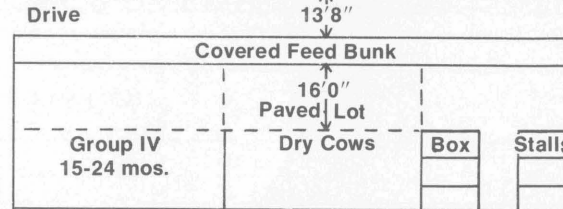
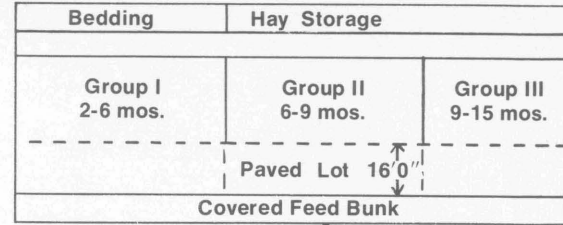
**Herd Replacements
Dry Cows Layout**



Windbreak



**Milking Herd
Layout**



Manure Ramp

Road

Manure Ramp

Figure 13.
**A Complete Drive—
Through Dairy Layout**

This layout combines the facilities for the milking and dry cows (figure 1) and replacements (figure 12) into an efficient, compact unit.

THE HEIFER FROM 15 MONTHS OF AGE TO CALVING

- **Provide adequate amounts of a quality forage.**
These heifers will generally do well if sufficient quantities of high quality forage are provided.

- **Feed 4 to 6 lbs. of grain daily, if necessary, to maintain body condition.**

- **Supply salt and minerals in the feed or free choice.**

Either trace mineralized or iodized salt is satisfactory.

- **Provide 40 sq. ft. of housing space per head if heifers are confined (Figure 12).**

- **Grow heifers rapidly and breed them to calve at approximately 24 months of age.**

- **Use the same heat detection techniques used on milking cows for heifers.**

- **Provide a breeding area in the heifer facilities for artificial breeding.**

In Figure 12, the breeding area could be located in a section of Group IV. A gate arrangement to hold, catch, or confine heifers for breeding is a time-saving asset in a heifer facility.

- **Use different colored ear tags to quickly identify and evaluate daughters of different sires before they freshen.**

- **Mark freshening dates on heifers with livestock paint sticks.**

Heifers which are due to freshen can be watched more closely. Fenceline feed bunks with lockup stanchions make this task easy.

- **Acclimate heifers to daily milking routine.**

Heifers should be trained to enter and leave the milking parlor prior to calving.

Figure 13 illustrates plans for a drive-through dairy layout which combines facilities for milking herd, dry cows and herd replacements into an efficient, compact unit.

LABOR MANAGEMENT

Relatively few large herd operators will be able to conduct their business with family labor alone. Heavy reliance on hired employees will place many large herd operators in the unfamiliar and sometimes uncomfortable position of managing people. Admittedly, many dairymen have had little experience in this area. Yet, the successful application of many practices suggested in this publication depends upon qualified, reliable, and interested employees.

Western Dairying

Surveyed dairymen stressed the importance of satisfactory labor relations to the success of their operations. Some of the dairies visited employed 30 or more people. Wage rates paid to dairy workers in this area are among the highest in the United States. Monthly wage rates of \$800-\$900 were being paid to unionized milkers in Southern California. Dairymen in this area have had to adopt pay scales, fringe benefits, work schedules, and vacations similar to industry to remain competitive in the labor market. A Californian described the labor situation this way, "A milker's job is difficult. It's a restrictive type of job. There's not much chance for social outlet. Workers constantly hear about 4 or 5 day workweeks and all kinds of fringe benefits."

Because of large herd size, it is possible for employees to become specialized and thus, obtain high rates of labor efficiency. Milk sales per employee of 750,000 to 1,000,000 lbs. per year were not uncommon on the farms visited. Typically, an employee milks 400 cows in an 8 to 10 hour day. He is replaced by a relief milker on his day off. Other employees specialize in feeding cows, raising calves, etc. Continuous attention to training, supervision, and communication were cited as basic to a smoothly functioning labor program.

Management Guidelines

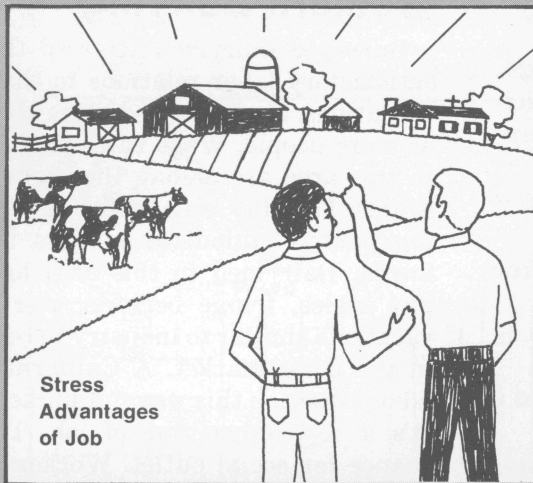
The following guidelines are offered for consideration in developing and maintaining a successful labor management program (Figure 14). These suggestions will not entirely eliminate all labor problems but they can assist in reducing costly labor turnovers and related problems.

- **Sell your job openings.**

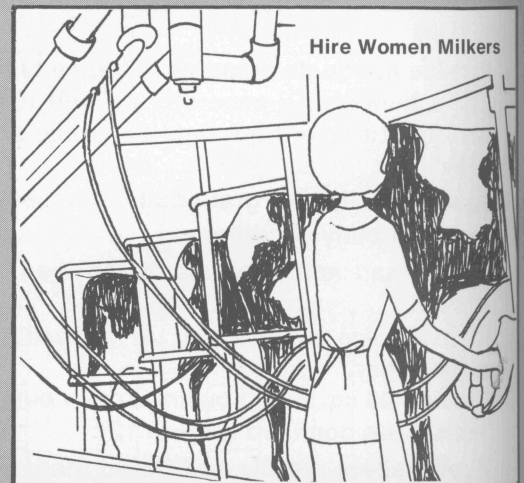
Place yourself in the prospective employee's shoes when you advertise a job opening. What do you have to offer besides hard work? Stress the pay scale, fringe benefits, time off, and vacation you can offer. Your reputation can help fill jobs. Satisfied employees on a farm pass the word around about job openings on your place. A California dairyman said, "If you run a cheap shop or working conditions are bad, you can forget it (hiring good help); you can advertise in the paper, you can fly a balloon, nobody will show up. If they know people have been on the place 15 years, they figure the job can't be all that bad. If there are people in and out of the gate all the time, you'll have trouble."

- **Consider new sources of labor.**

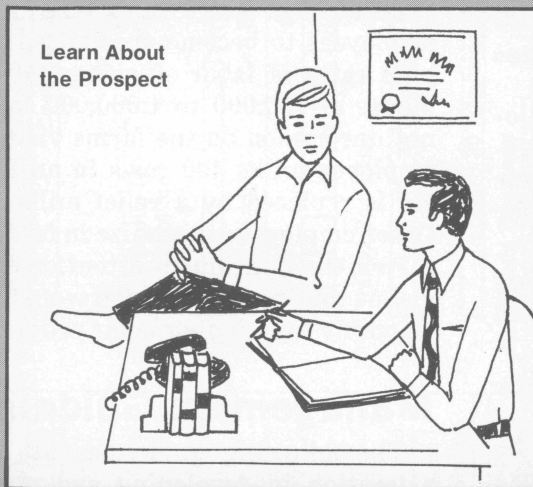
Women milkers and calf raisers are being used



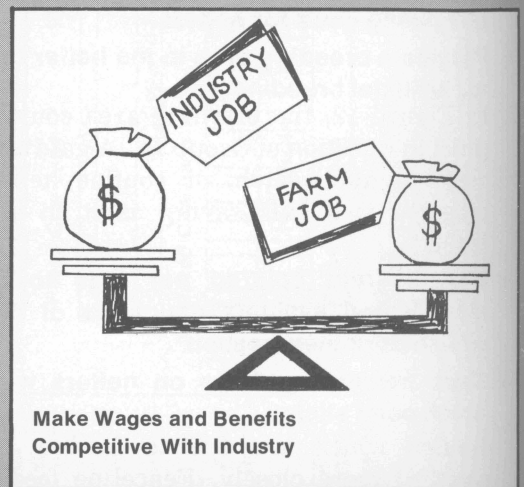
SELL JOB OPENING



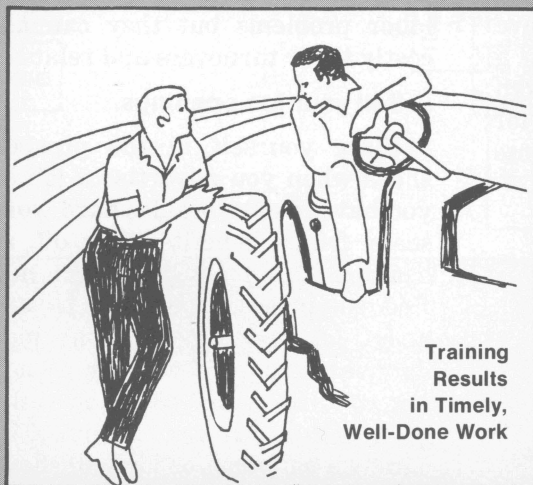
NEW SOURCES OF LABOR



INTERVIEW



MAKE JOB COMPETITIVE



TRAIN NEW EMPLOYEES



MOTIVATE EMPLOYEES

figure 14.

Components of a Successful Labor Management Program

successfully on large dairy farms. Local people looking for part-time employment to supplement incomes can relieve milkers, etc. Returning servicemen may be looking for employment.

● Interview prospective employees.

A properly conducted interview enables you to learn something about the prospect. Plan what you are going to ask him. Use an interview form to record information. These are available from the office of your County Extension Agent.

● Make wages and benefits competitive with industry.

A large herd operator in Texas said, "You can't do enough for good employees. They'll make you money." To be attractive in the future a milking job may have to offer the following: a) an 8-10 hour day; b) a 5-6 day workweek; c) paid vacation—one week after a year's employment, two weeks after two years, etc.; d) medical and life insurance paid by the employer. The employee pays for coverage for his dependents; e) pension plans which accumulate retirement income for employees, and f) incentive payments based upon milk production, low mastitis counts, etc. For further information on incentive plans request Southern Farm Management Extension Publication 13, *Incentive Payments for Farm Employees*, from your county agent.

● Value the benefits you can offer.

List the basic wage, value of housing and utilities, time off, vacation, sick leave, insurance, bonuses and retirement plans available. Place a dollar value on these items so the prospect can compare them with other jobs. Worksheets for this purpose are available from the office of your County Extension Agent.

● Train new employees.

The owner or herdsman should take initial responsibility in training a new man. Team the new employee with an experienced milker until you are satisfied he can handle the job. One large dairy the authors visited takes training new employees quite seriously. A television camera was used to record a new milker's performance on video tape. The herdsman and the new milker review the tape together in an effort to improve the milker's performance.

● Communicate with employees.

Use blackboards, bulletin boards, intercoms, and meetings to relay information. A previous section illustrated the use of blackboard communication in the breeding program. (See Figure 3, page 9). The authors were impressed by one employer who addressed each of his 30 employees by first name and in Spanish (most of the employees were Mexican-Americans). This little extra effort in communication could mean the difference between keeping or losing an employee.

● Motivate employees.

Here are some comments from successful labor managers:

"You have to make employees feel they are helping you and they're not just slaves. In a dairy, they (the employees) can ruin you overnight. We don't discourage them (employees) from helping out. We try to involve them. You've got to do that if you're going to get the most out of the job. Without good milkers, you're dead."

To motivate employees: (a) recognize that responsibility motivates some men, (b) use titles like herdsman or foreman to satisfy a man's need for recognition, (c) appeal to man's desire to achieve—a California dairyman reports daily milk yield and mastitis counts for each of his milkers. His milkers compete against each other to do a better job, (d) don't underestimate the intelligence of employees.

"You can't look down on an employee or else you'll have problems. They are motivated by the same things as everyone else."

Quite often motivational factors actually involve little "out of pocket" expense.

BUSINESS PRACTICES

An important component of a well-managed dairy operation is adequate financial planning and management. Many dairymen have learned that business mistakes can be quite costly with a large herd. The borrowing and handling of large volumes of money require close attention to details. A current and complete set of business records is an integral part of a farm's business management program. Financial planning techniques like budgets and cash flow statements can assist in making smooth business adjustments.

Many large herds will be owned by several persons—usually family members. Security of future ownership is essential if the business is to

operate at optimum efficiency. Joint farming agreements, like partnerships or corporations, should be considered to provide this security. A large herd operator shouldn't expect to develop the expertise of a public accountant, investment counselor or attorney. He should, however, have a general knowledge of some aspects of these professions where they have a direct bearing upon his business. The large herd operator should be aware of business management services available to him and should use these services in his management program when needed.

Western Dairying

Business records play an important role in the operation of the farms visited by the authors. Many of the operators participated in computerized business records programs. Tax accountants, who are knowledgeable about farm income tax regulations, were often hired to assist in year-end tax planning and to file tax returns. Business records were commonly used to evaluate the progress of the business. That is, the current year's profit and costs of production figures were compared with the preceding year's figures.

Detailed enterprise accounts were kept by those farms considering changes in production practices. Whether to raise or purchase dairy heifers or feed out dairy steers were two practices being evaluated in this manner. Western dairymen use large amounts of credit to finance current operating expenses (hay purchases), and to finance further expansion and capital improvement. Lenders and dairymen work out detailed budgets and 3 or 4-year cash flow statements to carefully tailor repayment terms to the farm's ability to repay. Dairy Credit Associations have been organized by primary and secondary lenders.

By keeping informed of each other's transactions with dairymen, creditors have helped dairymen avoid the pitfalls of over extended lines of credit. Large herd operators used volume discounts to advantage and provided themselves with some services such as milk hauling, which a smaller dairyman normally hires. Consultants for tax work, estate planning, etc., were considered a sound business investment by many dairymen.

Management Guidelines

Listed below are some business management practices which are being used by successful large herd operators. Consider incorporating some of these ideas into your management program (Figures 15 and 16).

● Keep complete business records.

A satisfactory set of records should include a net worth statement, a listing of income and expenses for current month and totals to date, a profit and loss (P & L) statement, a payroll account for hired employees, and an income tax depreciation schedule. Add enterprise accounts, cash flow statements, and drawing accounts as needed.

● Plan your financing needs.

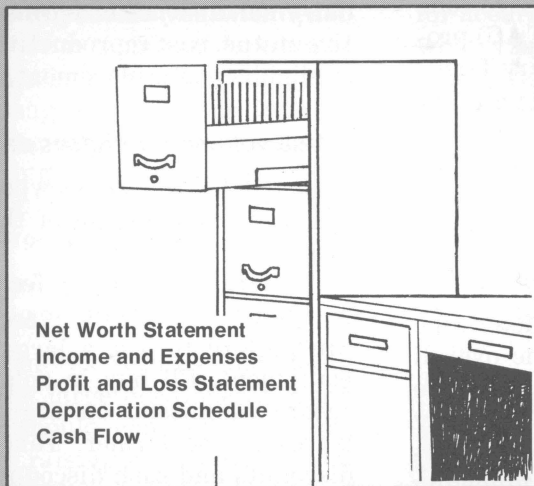
An accurate set of business records is required to obtain financing from most lenders. Lenders will evaluate a dairyman's management ability even more closely in the future before extending credit. Use budgets and cash flow statements, backed up by good business records, to sell your plan to the lender. An Arizona banker with long term experience in financing large dairy operations stated, "I can tell a lot about a man by the time he takes to prepare a financial statement. For example, July and August are stress months here in Arizona; if a dairyman uses the same \$20,000 a month figure for the feed bill, I'll question his statement. I know that feed intake drops off a lot in those hot summer months."

● Plan your tax program.

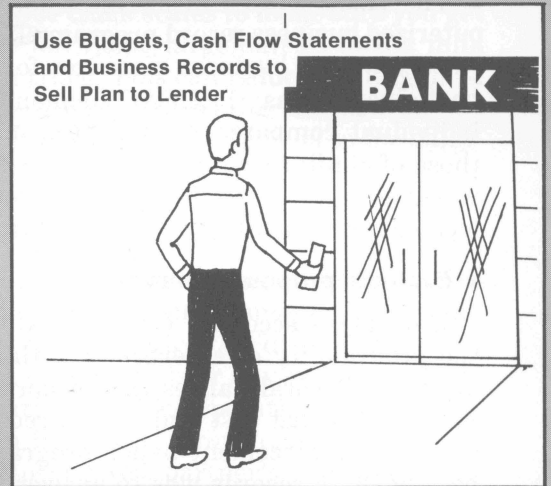
Use business records for year-end tax planning and to file tax returns. During the last 45 days of the business year review the income and expense position of the business to that point. Budget the additional income and expense items for the remainder of the year. Next, fill out a trial tax return. If estimated taxes appear to be large, additional purchases of feed, fertilizer or equipment should be considered to reduce taxable income. These purchases should be made for items the business needs. Optional first year depreciation and faster depreciation write-offs can also be used for newly purchased items that will be added to the farm's depreciation schedule. Consider income averaging as a means of reducing income taxes.

● Measure your progress.

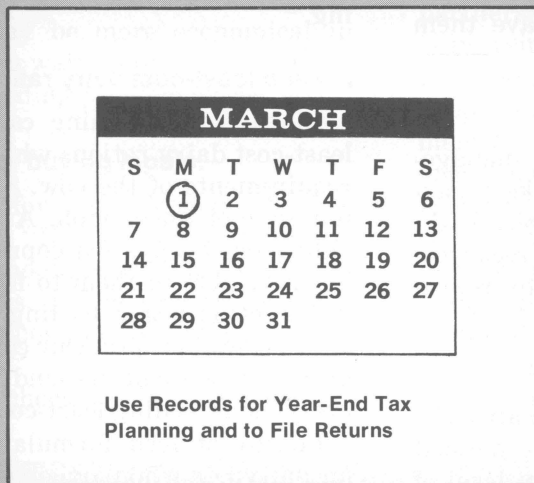
Compare the farm's performance for the first 6 months of the year (or any number of months) with the same period for the preceding year. Start the comparison in the income section and continue with the expense section. Compare feed, fertilizer, labor and repair expenses, etc., with the preceding year's outlays. A Texas dairyman describes this kind of business analysis as follows: "These monthly statements are kind of like a rolling herd average, but are really rolling money averages of the business."



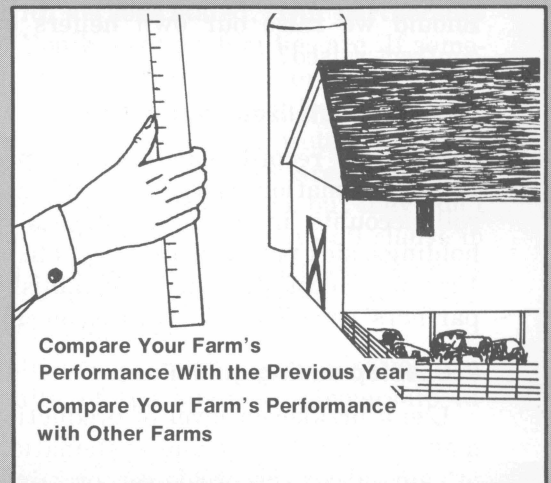
KEEP COMPLETE BUSINESS RECORDS



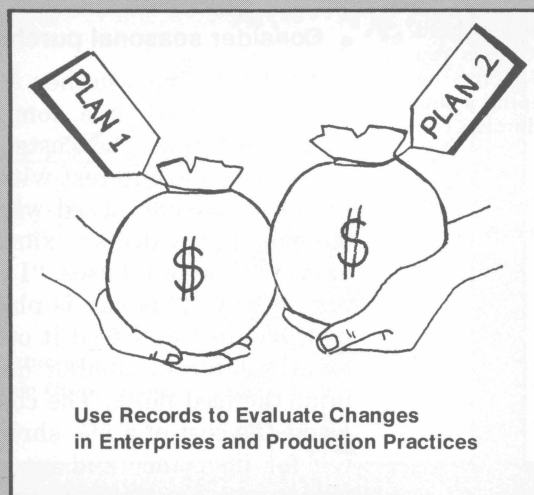
PLAN FINANCIAL NEEDS



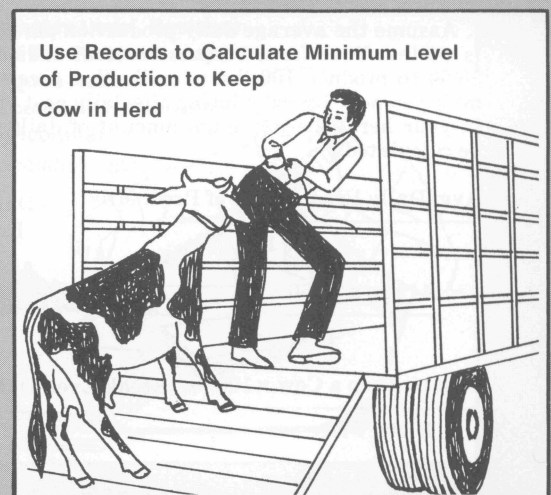
PLAN TAX PROGRAM



MEASURE YOUR PROGRESS



EVALUATE CHANGES



DEVELOP CULLING GUIDELINES

Figure 15.

Business Records Aid in Making Management Decisions

The Texas Agricultural Extension Service computerized business record program (TELFAC) provides year-end business measures for dairy farms participating as TELFAC demonstrators. The individual compares his business measures with those of similar size farms to locate strengths and weaknesses in the business. Once trouble spots are located and identified, adjustments can be made.

● **Evaluate proposed changes.**

Enterprise accounts can be used to determine the profitability of enterprises within the overall business. Several dairies the authors visited were keeping detailed cost and return records on dairy steer and replacement heifer programs. The purpose of these records was to answer the following questions: Can we more profitably market our male calves as steers rather than bob calves? Should we raise our own heifers or have them contract raised?

● **Keep specialized information.**

Business records can provide special management information. Large herd operators keep payroll accounts in which employees' wages, withholdings, sick pay, vacation pay, etc., are recorded. Drawing accounts can be established to record partners' salaries and advances on salary.

● **Develop culling guidelines.**

Use a breakeven level of production analysis to make culling timely and systematic. The method of calculating the breakeven or minimum level of production to keep a cow in the herd is illustrated in the following example:

Assume the average daily production per cow in your herd is 44 lbs. Your farm business records indicate it costs you \$6.50 to produce 100 lbs. of milk. You receive \$7.10 for the milk you sell. By calculating the daily cost of keeping a cow in your herd, the minimum amount of daily production can be calculated.

$$\frac{\text{Avg. Daily Prod.} \times \text{Cost of Prod. Milk}}{100} = \text{Daily Cost to Keep a cow}$$

$$\frac{44 \text{ lbs.} \times \$6.50}{100} = \$2.86$$

$$\frac{\text{Cost to Keep a Cow} \times 100}{\text{Blend Price}} = \text{Break Even Daily Prod. Level}$$

$$\frac{\$2.86 \times 100}{\$7.10} = 40.2 \text{ lbs.}$$

Dairymen using this guideline indicate it best fits cows in early or mid-lactation. First-calf heifers are sometimes excluded.

The calculated breakeven level of production should not be the only criterion for culling. The

dairyman also needs to consider: present reproductive status, past reproductive history, health status, availability of replacement, and need for base milk.

● **Use volume purchases and discounts.**

Listed below are viewpoints of dairymen who are taking advantage of the purchasing power a large business offers:

"A large volume of feed purchases enables a dairyman to bargain for lower prices. The mill can't afford to lose a large account. When I buy equipment, I'll buy in volume. The dealer gets a rebate commission on large volume sales. He'll cut prices to the farmer. Take advantage of volume discounts and cash discounts. We get a \$1 per ton discount for 10 ton lots and 2% discount if we pay cash within 10 days of the preceding month's billing."

● **Feed least-cost dairy rations.**

Linear programming can be used to calculate least-cost dairy rations which meet the nutritional requirements of the cow. Savings of \$5 to \$8 per ton are not uncommon. A Californian said, "The old-timers always fed copra meal to cows. It was inconceivable to them to feed a ration without it. A few of us began feeding least-cost rations that didn't contain copra. Our cows produce just as well or better without it—and at a lower cost. Now everyone is feeding least-cost."

Least-cost feed formulations can be prepared for dairymen who participate in county dairy demonstration projects of The Texas Agricultural Extension Service.

● **Consider seasonal purchases.**

To determine whether it will pay to buy feedstuffs at harvest time, compare the cost of the feed at harvest plus the costs of shrinkage, storage, insurance, and interest with the estimated price of the feedstuff purchased when needed. An Arizona dairyman provided an example of how he evaluated harvest time purchases, "I can buy hay for \$38 per ton in May. This hay is placed in stacks and must be rehandled as I feed it out. I can also buy hay 6 months later in smaller quantities which is laid in at the feed bunk. The cost is \$48 per ton. When I add the cost of a 5% shrinkage, 40¢ a month per ton for insurance and interest, and \$3 per ton to feed it out, I come up with a cost of \$45.30 per ton for hay I buy at harvest time. In my case, it's cheaper to buy hay at harvest time and store it."

● **Mix and grind your own concentrate rations.**

An important consideration is whether the feed mill has the latest up-to-date equipment and

competent nutritionists to provide you with least-cost formulations. If their rations are dependable in quality and economically priced, the dairyman can concentrate his management abilities in other areas. On-farm processing requires competent help and a good understanding of nutrition. See Texas Agricultural Extension Service Bulletin 972, *Farm Feed Processing—Equipment, Planning and Design*.

● **Contract some services.**

By reviewing his business records and doing some pencil pushing, the large herd operator can determine whether he should contract out some jobs to others. Contract raising of heifers, custom harvesting of some crops or contract production of feed are examples. Contracting a veterinarian's services for preventive medicine and a regular treatment program may be more economical in the long-run rather than waiting until a flare-up of disease or a serious breeding problem arises.

● **Develop a strategy for buying inputs.**

Develop a strategy for the salesman. A New Mexico dairyman says, "If a new product is good enough, the company should be willing to sell it at half-price for 6 months. If the product is satisfactory, I'll pay the other one-half at the end of 6 months."

Use the telephone to check prices. Check invoices

for accuracy. Use truck scales to make sure you get what you pay for. Some large dairies own a milk truck or grain truck. This can reduce hauling bills. Certain cooperatives can realize savings on the purchase of supplies and pass these on to the dairyman.

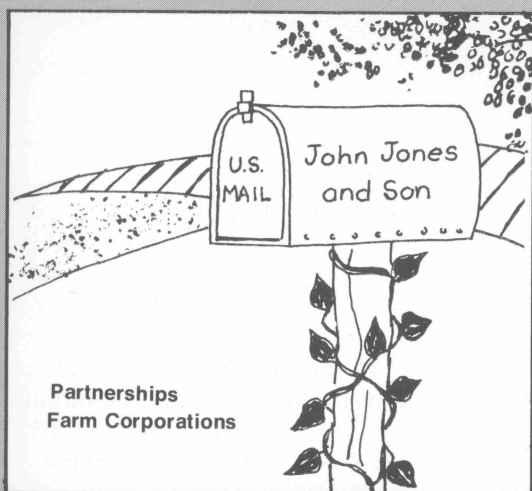
● **Plan for business continuity.**

Business arrangements require written agreements that spell out how the business will continue if one of the owners retires or dies. Partnership arrangements can use wills or buy-sell agreements to provide continuity of the operation. Partnership insurance can be used to provide cash to buy out the deceased or retired partner's interest in the business.

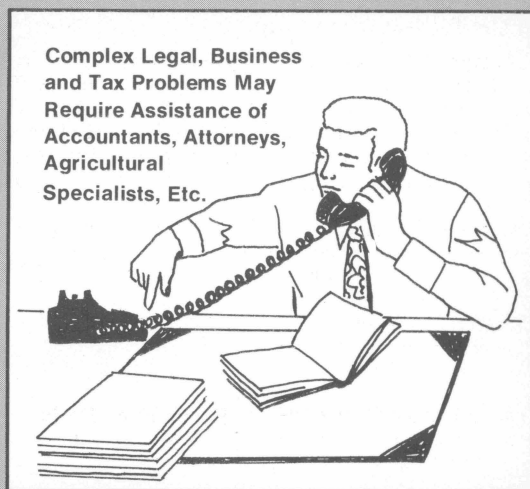
A Californian operating a 700-cow dairy in partnership with his sons stated, "Our partnership is in writing. You know how families are. If something happens to one of my sons or the parents, people start changing their minds. But our agreement is in writing and is legal. It protects the sons operating the farm with me. There are three other brothers and sisters to consider too, but they don't care about the dairy. We have a buy-sell clause in our agreement. In the event something happens to my wife and me, the boys will be able to get the farm and continue the operation."

The corporate form of business organization can assure continuity of the business. Ownership in

Figure 16.



PLAN BUSINESS CONTINUITY



USE CONSULTANTS

**Important Management Considerations:
Business Continuity and Adequate Information**

the business is represented by shares of stock. Shares can be given, or willed or sold to other owners of the business. If one of the owners dies or retires, the corporate by-laws specify how the shares of stock are to pass to the other owners. Like the partnership, the corporation can buy insurance to provide funds to buy out an owner's share.

In addition to its estate planning features, the corporate form of business organization may provide income tax benefits to the large herd operator. For additional information about estate planning and farm corporations, ask your county agent for *Estate Planning for Farmers and Ranchers* (L-774), the series of estate planning leaflets L-950 through

L-956, and *The Texas Agricultural Extension Service*, MP-998.

Before deciding on which form of business organization to adopt, the advice of an attorney, accountant, and agricultural specialist should be obtained.

- **Use consultants for special problems.**

The complex nature of tax and legal regulations pertaining to the dairy business sometimes requires the expertise of an accountant, tax specialist, or attorney if the dairyman is to minimize costs. These people keep abreast of changing regulations, etc. and are in a position to turn this knowledge into savings for the dairyman.

PUBLICATIONS AVAILABLE*

B- 965	Production and Feeding of Forage Sorghum in Texas
B- 972	Farm Feed Processing—Equipment, Planning and Design
B-1006	Storing and Handling Silage in Horizontal Above Ground Silos
B-1036	Drylot Dairying in Texas
B-1071	Harvesting and Drying Selected Forages
B-1080	External Parasites of Cattle
B-1082	Production and Management of Small Grains for Forage
MP- 546	Dairy Building and Equipment Plans
MP- 644	Stage of Maturity for Harvesting Sorghum Varieties and Hybrids for Silage
MP- 679	Feed Milling and Mixing in North Central Texas
MP- 691	Texas Guide for Controlling External Parasites of Livestock and Poultry
MP- 972	Keys to Profitable Dairy Production
MP- 998	The Texas Agricultural Extension Service Farm Record System
MP-1041	Guide for Constructing Manure Disposal Lagoons
L- 700	Anaplomosis of Cattle
L- 730	The How and Why of Farm Income Tax Management
L- 774	Estate Planning for Farmers and Ranchers
L- 776	Installation and Operation of Milking Equipment
L- 864	Factors That Affect Butterfat Tests
L- 913	Selecting Dairy Sires
L- 955	Federal Estate and State Inheritance Taxes
L-1012	Incentive Dairy Payments
D- 317	Breeding and Calving Record
D- 386	Feed Chart for the Milking Herd
D- 847	Catalog of Building and Equipment Plans
D-1077	Determining Pregnancy in Cattle
TR- 100	Dairy Herd Replacement Costs
PR-2374	Effects of RS 610 Sorghum Head Haylage and Other Forages on Milk Production and Feed Costs
TAP- 171	The Use of Feed Additives
TAP- 185	Dried Citrus Pulp in the Dairy Ration
TAP- 391	Low Roughage for Summer Feeding of Dairy Cows

* Copies of these publications are available from your county Extension office of the Texas Agricultural Extension Service or from the Department of Agricultural Communications, Texas A&M University, College Station, Texas 77843.

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