COOPERATIVE EXTENSION UNIVERSITY OF CALIFORNIA

DAIRY Tales

Volume 7, Number 4 April, 1977

File Dairy Mgt. General

DAIRYING UNDER THE SIEGE OF DROUGHT

C. L. Pelissier, Extension Dairy Scientist
University of California, Davis
March 15, 1977

Dairying management under drought conditions has so many angles that to make appropriate recommendations requires a crystal ball with a wide-angle lens. Perhaps the most difficult of all questions to answer is, just how tough a situation are we in? Just how severe, how long, how widespread will the drought be, and when will relief arrive, are questions without answers. How successful will feed crop growers be in supplementing their reduced surface water supplies with well water? What will be the impact of reduced hydro-electric power and heavier pumping on electrical power deliveries so critical to milk producers?

The drastic reduction in surface water allocations from California's two major water projects needs consideration, of course. But more recently the concept that the drop in surface water supply will be offset to a large degree by greater dependency on underground water reserves has gained momentum. Estimates on the net effect of the drought on California's agriculture range from "severe" to "normal or nearly normal in most areas". There seems to be general accord on one point, however, that production costs will be higher.

Rather than select an arbitrary level within this wide range of personal opinions, the discussion following is presented with the philosophy that maybe the best way to go is to prepare for the worst and hope for the best. It is not likely that any dairyman will find all the recommendations applicable to his operation but, hopefully, a broad enough spectrum of possibilities is offered to provide most dairymen with a few suggestions that can be put to work. Furthermore, it must be recognized that no suggestion will cure the drought problem, the best that can be expected is to ease the pain.

THE DAIRY PLANT

There is not much flexibility in water utilization in the dairy plant because regulations require clean cows, washed and dried udders, clean and sanitary milking and storage equipment, clean milking barns and milk houses. The milk must be cooled quickly after milking and kept cool.

Fortunately, wells provide the water for most dairy operations although some are supplied by farm reservoirs or public utilities. Consequently, there will be few problems with the dairy plant as long as the wells hold out. No unusual problems are expected in southern California because of normal or nearly normal rainfall throughout most of this region during the last two years. Dairymen who

(MORE)

The University of California's Cooperative Extension Programs are available to all, without regard to race, color, or national origin.
University of California and the United States Department of Agriculture cooperating.

are skeptical about their wells may improve their position by having their water system checked. It may be possible to improve the reliability of the water supply by improving the efficiency of the pumping system, putting in new wells, or deepening existing wells. Well drillers and pump service organizations are a busy group these days as many farmers are modifying their water systems, so get on the priority list as soon as possible if you plan to go this route. As the availability of underground water varies considerably between areas, local water authorities may be able to allay your fear without unnecessary expense.

Many dairies are already recycling water used for refrigeration and cooling. As the quality of this water is basically unchanged, it can be reused for washing udders, barn clean-up, and if necessary, for stock water. This is good business under normal conditions and the need may never be any greater than during the current drought. So -- if eventually, why not now?

Dairymen who use flush systems for manure removal in their alleys, feeding areas and free-stall housing can save considerable water by switching to scraping these areas with mechanical equipment. This is nonsense, of course, if this wash water is normally recovered in the manure pond or pit and used for irrigation because the only gain would be the reduction in evaporation losses. With such systems, scraping would be feasible only if the well supplying the dairy plant is more likely to run dry than the wells used for irrigation.

Clean cows require less washing. If your cows are coming into the milking barn dirty, find out why. It is possible that more bedding in the free-stalls or lounging area, or changing the bedding more frequently, will significantly reduce the amount of water needed for washing cows before milking.

Cows are usually clipped in the fall or early winter because this facilitates washing. Cows usually shed their undercoat in the spring and most require no clipping during spring and summer. But cows vary considerably in this characteristic and, if the amount of water needed for washing cows is excessive, clipping the udders and thighs may reduce the amount of water needed for washing.

If none of these possibilities can be put to work, the only water saving method left is to use water more frugally -- a hollow statement for dairymen in the North Bay Area who have been hauling water for months.

THE FEED ASPECT

How the drought will affect feed supplies is of greater concern to most dairymen than the water supply for their dairy unit. In this regard, it is advisable to evaluate concentrates and forages separately.

CONCENTRATES. The availability of feed grains and by-product feeds is not likely to be affected. California depends quite heavily on out-of-state sources for both feed grains and by-product feeds. Even if the drought does affect feed grain production within the state, we would simply draw more heavily on imports. Prices are not likely to be affected because our concentrate prices are influenced primarily by mid-western prices and freight rates. Final estimates of 1976 feed grain production indicated a record national production of 212.4 million tons; by-product feed production varies only slightly from year to year. Consequently, concentrate supplies and prices are likely to remain relatively stable, at least until the new crop comes into focus more sharply. Some seasonal increase in prices is likely, however.

FORAGES. If feed shortages develop, they are likely to be in the forage (roughage) crop sector. The drought has caused rangelands to deteriorate badly, but few dairymen depend on native pasture for their milking herd. Thus far, there has been no panic in the hay market; hay prices have remained comparatively stable since mid-December, according to Hay Market News reports published by the Federal-State Market News Service, and only light to moderate trading was reported at the major California markets. This would indicate relatively normal supplies for the immediate future. As the price of other forage crops closely follows hay prices, our discussion will be simplified by placing primary emphasis on hay.

The impact of the sharp reduction of surface water allocations for cropland is not yet clearly defined. It is difficult to determine to what degree well water will fill this gap. This is another grey zone with a difference of opinion. Well drillers and pump sales and service organizations are doing a brisk business, indicating that many growers are tooling up as rapidly as possible to use their underground water reserves as much as needed to maintain maximum production.

Despite growers' efforts to maintain "business as usual", the forage supply will not improve, it is more likely to deteriorate. But if forage production decreases, how sharp will the decrease be? Perhaps this picture will come into focus more clearly when the spring planting is done and the competition between crops for existing water supplies becomes more evident. It is likely that crops with lower water requirements than alfalfa, or net a higher return, will be higher on the water priority list than forage crops. This is not likely to be the case with dairymen who raise their own forage, however. Dairymen who buy their hay may need to reach out farther for an adequate supply, but the bulkiness of hay restricts the distance it can be hauled within economic limits. Furthermore, it remains to be seen how plentifully out-of-state supplies will be because some of the other western states also are under the siege of drought.

WHAT IF FORAGE SUPPLIES ARE REDUCED?

To avoid being caught short, let us assume that forage supplies will fall below demand despite the pros and cons cited. What then? Go heavier on concentrates and spare the roughage (forage)! Concentrates provide energy more cheaply than forage crops at current prices in most areas now. So, if hay prices increase further in relation to concentrates, the economic advantage in energy cost will favor concentrates even more. Heavier use of concentrates will reduce the consumption of hay and other forages, and extend existing supplies. The protein story is somewhat different because alfalfa is a high protein forage. If alfalfa is reduced in the total ration, more protein will be needed in the concentrates. In contrast, if the amount of low protein forage such as oat hay or silage is reduced and more concentrates are fed, less protein will be needed in the concentrates than previously.

There are definite limitations regarding how far we can go in replacing forage with concentrates because a cow needs a certain amount of fiber to maintain normal function and fat test. It is usually considered that 60 percent concentrates by weight (dry matter) is a maximum practical limit, but this is influenced by the fiber content of both forage and concentrates fed. If high fiber ingredients such as beet pulp or whole cottonseed are used in the concentrate mix without a drop in energy values, the concentrate portion of the ration could be boosted a bit higher.

Alfalfa growers with a limited water supply may provide their alfalfa with less water or let it grow to greater maturity before mowing. In either case, the hay

is likely to be higher than usual in fiber content and lower in protein and energy. Even though this would allow a dairyman to go heavier on concentrates, it is necessary to know the protein and energy level of this alfalfa to properly balance the dairy ration. Knowing your hay may be more important than usual this year, particularly with late summer and early fall cuttings. A chemical analysis of your hay supply is likely to pay greater dividends than usual.

Ordinarily, we try to feed high producing cows concentrates to the maximum limit and spare the concentrates with the average and lower producers. This is good economy during a normal year. If forage prices increase sharply, we may not be able to feed the high producing strings more concentrates without getting into trouble. But considerable forage can be saved by feeding the lesser producing groups more concentrates in relation to forage if concentrates provide nutrients cheaper than forage.

If there isn't enough alfalfa or good quality forage for the entire herd, group feeding will allow feeding the higher producing groups the best quality forage. This is essential to achieve a high enough intake to maintain maximum production. The forage of lesser quality can best be utilized by the lower producing and dry cows if properly supplemented with concentrates. Maximum feed intake is not as critical with these cows as high producers. If things get so tough that coarse roughages such as straw, cottonseed hulls and other low-energy roughages must be fed to maintain fiber level, these also can best be used by feeding to the low producers and dry cows.

It is very important to watch the protein, energy, fiber and mineral levels of the ration when we get into abnormal rations such as those discussed. When price fluctuations demand a change in ration, the new ration must be checked critically to make certain the intake of nutrients is adequate to maintain the expected production level. Under such conditions, dairymen may find computer calculated rations an even more worthwhile investment than usual.

FORAGE FOR NEXT WINTER

Dairymen who grow their own forage have another ace in the hole. If, for example, such a dairyman is short of forage for fall and winter feeding he might be able to augment his forage supply by planting cereals during late summer or early fall. Water requirements for such crops are relatively small and come at a time when the need for water for other crops is reduced. Barley, oats or wheat are likely to be the cereal of choice for this purpose and should be planted in early September for maximum yields in most areas of California. But as some area differences do exist, it is best to consult your local Farm Advisors Office for more precise information concerning the choice of cereal and varieties, planting dates, and cultural practices. Planting early is important for maximum forage production because growth is more rapid while the weather is still moderately warm. In contrast, cereals planted in November will grow slowly through the winter. Clipping or grazing before the cereals begin to node is very important for satisfactory regrowth.

Dairymen who normally grow cereals for silage may find that early planting will allow them to graze or clip one crop and have satisfactory regrowth for a silage crop.

REDUCE CATTLE NUMBERS?

It is more profitable to feed 90 cows well than to underfeed 100 cows because milk production level has such a great influence on profit (or loss). Even at the ordinary level of 50 pounds of 3.5 percent milk daily, a 10 percent reduction in energy intake would only be adequate for 83.6 percent as much milk. In other words, 83 cows fed sufficient energy to produce 50 pounds of 3.5 percent milk daily would produce as much milk as 100 cows receiving 10 percent less energy. So, if critical feed shortages do develop, herd reduction can provide some relief.

Reducing herd size is not as much of a setback as it may seem on first thought. Assuming that the lowest producing cows would be culled, the average production of the remaining cows would be higher. Herd size reduction also allows a dairyman to get rid of problem cows -- those going downhill because of mastitis, low fertility, old age, and other reasons. Culling these problem cows earlier than usual would allow the herd complement to bounce back rapidly when the effects of the drought have ended.

But look carefully before leaping! Unless you produce your quota during September, October, and November, you may lose production base. This may jeopardize your future allotment of new quota. Of course, if new quota is not in your plans for the future -- no problem! Your current quota will not be reduced.

WHAT ABOUT POWER?

R. C. Curley
Extension Agricultural Engineer

The drought will reduce the amount of hydroelectric power this summer and this reduction will come at a time when seasonal electrical demand is greatest. The supply of electricity, and the demand for it, are both affected by many factors which make it difficult to predict exactly what will happen.

Since the drought is having its greatest effect in the northern and central portions of the state, Pacific Gas & Electric was contacted for an assessment of the situation. The P.G. & E. representative contacted believes that the demand for electricity can be met this summer if there are (1) voluntary conservation efforts by customers, (2) no major breakdowns in generating plants, and (3) reasonably mild summer temperatures. If rolling blackouts become necessary as a means of controlling demand, all efforts will be made to provide advance notice via the media. A rolling blackout may last for a period of 1 to 4 hours but generally not longer than 2 to 3 hours.

The operation of electrical equipment is so critical that some dairies, particularly the larger ones, have previously purchased standby generators as insurance against power outages. The possibility of rolling blackouts this summer makes standby equipment even more attractive. It is easy to visualize the chaos that would result from a power blackout at a dairy with a corral full of cows to milk and a bulk tank half full of milk.

Here are some pointers in selecting standby generators and putting them in operation.

(1) Size the generator to handle the equipment it will be required to operate. Generators can be purchased for operation by a tractor power take-off.
(2) Make sure it is wired into the system by a qualified electrician and all safety regulations are met.
(3) Check and operate standby equipment periodically to make sure it will be in operating condition when needed.

C. L. Pelissier

C. L. Pelissier
Extension Dairy Scientist

DROUGHT MANAGEMENT

By: John Dunbar
Extension Animal Scientist
University of California
(916) 752-0525

Coping with the current drought is a difficult and expensive task for any California livestock producer. It already has caused severe and widespread difficulties and losses for livestock growers, and the end is not in sight. Minimizing these problems requires sound management and feeding programs. No specific drought management program can be applied to all situations. Cattlemen have to evaluate alternatives in relation to their individual situations.

A selling policy should be formulated both in terms of class of stock to sell and rate to be placed on the market. Consider saving the most desirable and younger cows and carrying them on minimal rations in order to save valuable breeding stock for replenishing the herd after the drought has broken.

(more)

It's important to wean calves at the right time during drought. Don't let the heifers or cows get in poor condition. Weaning ages can be classified into three groups:

1. Over 6 months.
2. 3 to 5 months.
3. 6 weeks to 3 months.
4. Under 6 weeks.

Calves weaned at 6 months or older require little special care other than normal hand feeding. Calves 3 to 5 months can be satisfactorily fed on good quality hay and grain. Calves 6 weeks to 3 months require special treatment, but there should be no hesitation in weaning all calves regardless of age to save the cows. Calves weaned under six weeks of age require special care, feed and management. Calves weaned at this age almost always suffer set-backs in growth after weaning and should be weaned only if survival of the cow is at stake.

Group and feed the herd according to their susceptibility to the drought. The following is the order of priority:

1. Calves under 3 months.
2. Lactating heifers or cows.
3. Calves 3 to 6 months.
4. Heifers or cows in the last third of pregnancy.

(more)

5. Calves 6 to 12 months of age.
6. Heifers or cows in early and mid-pregnancy.
7. Bulls.
8. Calves 12 months or older.

Cattle low on the priority list can stand long periods of nutritional stress and should be given low priority in the feeding program. Animals most likely to die in drought situations are young calves and pregnant and lactating heifers or cows. These classes of animals should receive highest priority and be fed the best feed. Bulls may require special attention because they are expensive to replace.

In feeding livestock during a drought it is important to know the maintenance requirements for animals of different age and weight.

The amounts of feed, crude protein, TDN, calcium, phosphorous and vitamin A required for maintenance of cattle are shown in Table 1.

It is well established that the weight, condition, plane of nutrition, stage of production and environment affect an animal's maintenance requirement. Cattle in good flesh may have a high maintenance requirement, but will be able to withstand severe drought conditions longer. If feed shortages are severe, carrying animals on a submaintenance ration for several months may be practical,

Drought 4-4-4

TABLE 1. NUTRIENT REQUIREMENTS OF CATTLE

	STEERS					COWS	
						DRY PREG. LAST 1/3	NURSING
Weight	220	441	661	882	992	992	992
Daily Gain 0							
As Fed Intake, lb.	5.1	8.5	11.5	14.4	15.7	18.3	22.8
CP%	8.7	8.5	8.5	8.5	8.5	8.0	10.0
TDN%	55	55	55	55	55	52	52
CA%	.20	.20	.20	.20	.20	.20	.28
P%	.18	.18	.18	.18	.18	.18	.25
Vit. A 1000 IU	5	8	10	12	14	23	23

providing change is gradual. After animals are exposed to severe drought conditions for some time, the maintenance requirement will decrease and a lower feed level will be adequate. Australian workers have been able to maintain herds of cattle physiologically adapted to a feed level below maintenance. Survival of the breeding stock is the main concern.

However, a sudden reduction in energy may cause high mortality. Gradual reduction of feed levels allows animals to adjust to the lower level with little pronounced effect. Weight loss can occur by allowing stock to draw on their own body reserves. However, animals should not be allowed to decline in condition and become weak because greater quantities of feed are then required to bring them back to good condition. Feeding the daily requirements twice a week or at weekly intervals is more effective than daily feeding. This is because less frequent, large feedings will allow the weaker animals, as well as stronger animals, to get their fill.

When full hand feeding is used, reduce movement of animals to a minimum to conserve energy.

Walking long distances for either water or feed uses energy which drought-struck livestock cannot afford to waste. It has been shown that up to 25 or 30 percent of the feed intake can be wasted in animals walking while looking for feed and water.

Good quality, palatable and easily accessible water is extremely important under drought conditions.

(more)

When feeding minimum roughage, care is necessary in getting animals on feed and preventing digestive disturbances. Drought-fed animals are also very sensitive to changes in feed. Even changes from one grain to another should be made gradually.

Provide sufficient trough space. One foot of trough space is sufficient for calves. Recommended space for adult stock is 2 feet and 18 inches for young stock.

Vitamin A deficiency can be a problem, particularly after females drop their calves. The young animal is born with little storage of Vitamin A and must get it from milk. When cows are fed drought rations low in Vitamin A, both the colostrum and milk produced have low Vitamin A concentration. Sufficient Vitamin A can be supplied by injection.

During normal feeding conditions, animals deposit most of the essential minerals in their bones. During short deficiency periods these stores may be drawn upon for use. Under prolonged drought, feeding supplemental minerals may be advisable, especially for young growing stock, pregnant and lactating heifers and cows.

Complete hand feeding of cattle in drought conditions may involve a variety of feedstuffs. Consider using low-quality roughages such as cereal straw, milo or corn stover, and cottonseed hulls. Poultry manure and litter are good sources of nitrogen.

# # # # # #