



Nutritional Management Practices Worth Adopting from California

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Summary

- California dairies are the most profitable dairies in North America due, partly, to the excellent climate that exists in the major dairy areas of California, but
- it is also largely due to the imagination and flexibility that California dairy people have brought to their business.
- Overall, be flexible, be open, treat the dairy as a business, and always seek out alternate management strategies.

Introduction

The dairy industry in California has enjoyed a period of unprecedented growth in the past 30 years. From a base of about 750,000 cows on about 5,000 dairies in the late 1960's, the current industry is comprised of about 1.45 million dairy cows on about 2250 dairies, and both these numbers are growing. This growth has made California the biggest dairy state in the US as well as making dairy the largest agricultural commodity in California. The collateral effects of this growth have

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impacted many areas of California society. From its impact on by-product feedstuff utilization to environmental issues to water quality to dairy product processing to labor issues, the impact of the California dairy industry in California has been substantial and diverse.

To sustain the increases in the number of cows per dairy, California dairy people have proven to be imaginative, resilient and flexible. Many of the practices adopted on California dairies have proven to be valuable either from the perspective of suppressing costs or increasing revenues or both. This article will discuss a number of management practices that are followed on California dairies. While not all practices discussed will be found on all California dairies, they will be found on many of the more progressive dairies and their use is increasing.

Calves

Practices related to raising heifer calves have changed dramatically over the few decades and calf raising activities are now a focal point on many dairies. Practices currently in use tend to be most advanced on the largest dairies.

Use of Calf Hutches

Calf hutches are very widely utilized in heifer raising systems. Relatively low cost and highly flexible, several types of hutch are currently in use. However regardless of the type of hutch that is used, it has been found to be beneficial if the hutches are spaced widely enough to prevent physical contact between calves in order to reduce the spread of diseases. Hutches are completely cleaned and sanitized between calves and often 20 to 30% more hutches are available than calves to allow the hutches to thoroughly dry out between calves. In addition, the ground that the hutches cover is regularly rotated to limit the build-up of pathogenic microorganisms in the soil.

Separate the Calf Raising Unit

As the size of dairies has grown, it has been found to be more feasible to separate the calf raising unit from the rest of the dairy. In some cases

this has meant shipping calves to professional dedicated heifer raising facilities where only calves are housed. However in most cases dairies have found it most practical to separate the heifer raising operation, while keeping it on site. This separation is functional, rather than theoretical, in that it involves dedicated equipment and employees to minimize disease transfer. In addition, the employees demonstrating the greatest skill with calves are assigned to the heifer facility and some compensation based on heifer, rather than dairy, performance.

Limit Use of 'Hospital Milk'

The practice of using milk from sick or milk with held cows is as old as the dairy industry itself. However recent findings that calves may become infected with diseases from hospital milk has led many producers to question this practice. Nevertheless, hospital milk has a positive nutritional value and a negative value if diverted to the waste stream. Thus some dairies have adopted the practice of pasteurizing all hospital milk prior to its use for calves. Many other dairies are investigating this practice and it seems likely that convenient on-dairy pasteurization units will be available in the near future.

Dry Cows

Dry cows were the forgotten animals on many dairies for many years. Indeed the dry period of dairy cows was frequently characterized as the time of lowest nutrient requirements, or as a resting phase in which the cow prepared for her next lactation. This tended to give dairy producers the impression that this period was of lesser importance to the cow and that the quality of virtually all inputs including feedstuffs, housing and management could be minimized.

But the thinking relative to dry cows has changed. These changes reflect the biological reality that the dry cow is undergoing many essential processes within her body, which prepare her for the next lactation. Thus the dry period, and in particular the late dry period, should be considered a critical period in which the quality of all inputs will directly impact the productive performance in the next lactation as well as the incidence of disease associated with calving. Many commercial management practices address these issues.

Division of the Dry period Based on Time

Many dairy producers divide dry cows based upon time before calving. The most commonly used time to move cows occurs at about 21 days pre-partum when cows will be moved from a far-off to a close-up, or transition, dry cow group. This division allows those cows closer to calving to be moved to an area where they can be observed more closely and intervention utilized in response to developing problems.

In addition, the energy and protein level of the close-up group is increased to compensate for the reduction in intake of dry matter (DM) that occurs in the final 10 to 20 days prior to calving. Recommended levels, which reflect commercial California practices are in the Table.

Nutritional Guidelines for Dry Cow Rations^a.

Ration number	1	2	3
Dry cow strings	Early dry mature cows	Early dry heifers Early dry special needs	Transition heifers Transition mature cows
Energy			
NEL (Mcal/kg)	1.1 – 1.2	1.45 – 1.55	1.45 – 1.55
Crude Protein			
Total (% DM)	12 – 13	13 – 14	14 – 15
Soluble (% CP)	40 – 50	35 – 45	35 – 45
Undegradable (% CP)	30 – 35	35 – 40	35 – 40
Fiber			
NDF (% DM)	50 – 60	35 – 45	35 – 45
ADF (% DM)	30 – 40	25 – 35	25 – 35
Minerals			
Ca (% DM)	.31 - .35	.36 - .41	.36 - .41
P (% DM)	.19 - .21	.22 - .25	.22 - .25
Mg (% DM)	.18 - .20	.22 - .25	.22 - .25
K (% DM)	.65 - .75	.70 - .80	.70 - .80
Na (DM)	.10 - .13	.12 - .15	.12 - .15
Cl (% DM)	.20 - .22	.24 - .26	.24 - .26
S (% DM)	.21 - .24	.25 - .29	.25 - .29
DCAD ^b (meq/kg)	0 to +150	-50 to +100	- 150 to -50

a - Adapted from R.J. Van Saun (Oregon State University).

b - Anionic salts may be needed to reach these values, especially if a high K forage is fed.

Division of the Dry period Based on Parity

First calf heifers tend to be more reluctant than multiparity cows to compete for bunk space and space in free stalls, and bullying by multiparity cows can negatively effect performance of heifers. Thus many California dairies divide the close-up group based upon parity with heifers penned separately from multiparity cows. This allows heifers to develop a social structure that will carry over into the lactation strings where heifers are often penned separately from multiparity cows for at least the first half of the lactation. In addition, the nutrient density of the close-up ration for heifers is often increased relative to that of the cows, reflecting the substantially lower DM intake of heifers during this period.

Identification of Cows Carrying Twin Fetuses

Another relatively recent innovation, still relatively underutilized on California dairies, is the practice of identifying cows carrying twins at the first pregnancy check and identifying those cows both in electronic records and by markings on the animal. Those dairies that rigorously identify cows carrying twins may follow up with practices such as drying the cows off 2 weeks earlier than normal, putting the cows directly into the close-up group, or a special needs group, and training employees that assist in calving the cows to recognize cows carrying twins by their markings in order to actually birth the second fetus. These practices are all designed to reduce the high incidence of metabolic disease, death, and excessive body condition loss that are commonly reported for cows birthing twins.

Division of the Dry Cows Based on Body Condition

A practice that is used on California dairies, although to a rather low degree, is the practice of assessing the body condition of cows at dry-off and assigning those cows with low body condition directly to the close-up, or a special needs, group. While the range in body condition of cows at dry-off is often extreme, an unfortunately low number of dairies use this practice, which is designed to reduce the incidence of metabolic disease, death, and excessive body condition loss in thin cows.

Use of High Energy Forages for Close-Up Dry Cows

Dry cows have traditionally tended to be fed lower quality forages than lactating cows based upon the belief that the nutrient requirements of dry cows are lower. While this may be true for far-off dry cows carrying adequate body condition, it is clearly not the case for close-up cows or far-off cows carrying insufficient body condition. Thus many California dairies make efforts to select forages, often legumes, that have a high nutrient density for their close-up dry cow group. This practice aims to reduce the loss of body condition common in close-up cows by increasing the nutrient density of the close-up ration even as its intake is falling as the cows approach calving.

Balancing Close-Up Rations for its DCAD Balance

One of the difficulties of using higher energy legumes for close-up dry cows is that they often have levels of potassium that make it very difficult to achieve a desirable DCAD balance without the use of anionic salts. Many producers try to avoid use of anionic salts, as they believe that it suppresses DM intake when the objective is to prevent its depression. Thus many dairies have active programs to identify lots of hay with low levels of potassium, but high energy values, for use in the close-up rations. This practice is growing in popularity as it allows high energy legumes to be used while reducing the need for anionic salts while maintaining a desirable DCAD balance.

Separate the Calving Pens from the Hospital Pen

The calving area has often been used as a sick cow area, or is near the sick cow area. This practice is declining in prevalence, albeit slowly, as producers recognize that disease transfer to calving and recently calved cows can be avoided if the hospital pen is separated from the calving area. This has also resulted in efforts to reduce movement of employees from the calving to the hospital area to reduce the spread of disease. Many dairies have found that employees that only have responsibility for calving has worked well, since the employees best suited to the task can be assigned and the focus of the employees is limited to the close-up group. Thus cows in need of assistance can be identified and assisted before a life-threatening condition develops.

Use of a Near Fresh Pen

Once cows calve, and are moved to the large high group pens, they may become 'lost' in the crowd. Thus many dairies utilize a near-fresh group into which cows are moved directly after calving and where they stay until it has been determined that they are recovered from calving, and ready to move to the high group. Generally, although not always, these cows are fed the high group ration in preparation for the high group pen. In addition, this pen may fall under the assigned area of the employees assigned to the close-up and calving pens, such that there is a continuing interest in the cows from a limited group of employees from the time the cows are moved to the close-up group until they are 'released' to the high group pen.

Lactating Cows

Lactating cows are the profit centre on the dairy. They consume the bulk of the feed and produce the bulk of the income. There are a number of nutritional practices that are used on California dairies to minimize the former while maximizing the latter.

Grouping Heifers Separately from Multiparity Cows

As noted earlier, many California dairies divide the close-up period based upon parity with heifers penned separately from multiparity cows. This practice is often mirrored in early lactation where first calf heifers tend to be penned separately from the multiparity cows. This practice is used in early lactation for the same reason that it is used in the close-up dry period. The reticence of heifers to compete with multiparity cows for bunk space and space in free stalls, as well as bullying of heifers by multiparity cows, can negatively effect their performance. Separate penning of first calf heifers allows them to develop a social structure, and self-confidence, that carries over into the pens where the parities are pooled in later lactation. In addition, the nutrient density of the ration for the heifers can be increased to compensate for their lower DM intake.

Use of Two Production Groups

Many California dairies utilize only two lactation rations. The bulk of the cows are in the high group and only cows approaching dry-off are

moved to a lower nutrient density ration to cause, rather than adjust for, lower milk production that will ease the transition from lactation to the dry period. This practice reflects the recognition that moving cows to lower nutrient density rations as they progress through lactation causes reductions in milk production, rather than reacts to it.

Use of Total Mixed Rations (TMR)

Most California dairies utilize TMR as their primary feeding system. The reasons for use of TMR are numerous and based upon years of practical experience. However the main cited advantages are its reduced requirement for labor when feeding hundreds, or thousands, of cows and the increased ability to incorporate numerous feedstuffs, often at low inclusion levels, into the ration. This facilitates use of commodities as feed ingredients. Use of TMR also reduces sorting by the cows thereby assuring that each cow actually receives the same ration, and that it is the ration that was formulated by the nutritionist and mixed by the feeder.

Aggressive Identification of Alternate Feedstuffs

Almost all California dairies utilize non-traditional feedstuffs that are the waste of some other feed or food processing operation. Opportunities in this area abound in California due to the very large size of the agricultural industry. Nevertheless, dairies have moved non-traditional feedstuffs from the nut, citrus, grape, truck-crop, sugar beet, export hay, food production, brewing, and grain sectors into the dairy mainstream. It has been estimated that between 25 and 30% of the intake of DM on commercial dairies in California is from non-traditional, or by-product feeds. Indeed California would have serious waste disposal problems without the existence of the dairy industry.

Clearly the breadth of the alternate feeds available in California is unique. Nevertheless, opportunities exist in many areas of North America that are not utilized, or underutilized, by the local dairy industry for numerous reasons. To avoid missing a local opportunity, you should contact feed and food processing facilities in your area to inquire about by-products of their processing operations. Also contact local landfills.

If a potential by-product feedstuffs are identified, no matter how unlikely it may appear, educate yourself on how the by-product was produced, right back to its origins in the field. Obtain samples and invest in complete chemical analyses, including trace minerals and residues of herbicides or pesticides that may have been used in its production. If the by-product is nutritionally and economically attractive, but only available part of the year, it may be worthwhile to store it for later use. Overall, be open to apparently odd feedstuffs. Be flexible.

Purchase of Feedstuffs as Commodities

There are very few large California dairies that do not purchase the bulk of their non-silage feedstuffs as commodities. As with the use of TMR, the reasons for this practice are diverse and convincing. However major advantages are that it allows cost savings by forward contracting commodities and buying more when prices are low. It also facilitates small changes in ration formulation and eases mixing of multiple rations.

Protect Feedstuffs from Weather Losses

The El Nino winter of 1997-98 resulted in heavy losses of hays, silages and commodities on many California dairies due to poor storage practices. Since that time many California dairies have invested in more covered storage for high value hays and commodities and regularly, and completely, cover hay stacks and silage piles with plastic and tires. Feedstuffs, whether purchased or grown on farm, are an investment. California dairies, and even the commodity producers themselves, now rigorously protect that investment from weather related losses.

Use of Nutrient Analysis in Purchasing Feedstuffs

Many California dairies purchase some or all of their forage needs, with the bulk of this being alfalfa hay. The California alfalfa hay industry uses a system in which alfalfa hay is classified in quality categories based upon its energy content and is traded on that basis. Prices vary widely among quality categories. Hays purchased in one category, but which fail to meet that category based upon chemical analyses of the hay by the dairy, will regularly be discounted or rejected by the dairy.

This principle is also used by many large California dairies in purchasing commodities. Min and max composition specifications are defined by the dairy prior to purchase and if they are not met, based upon chemical analyses of the commodity by the dairy, then the price is discounted or the shipment rejected.

Use Nutrient Analyses in Formulation

Many California dairies often reformulate TMR based upon changes in the nutrient composition of the feedstuffs used in the rations. This is particularly the case for silages produced on the dairy, where the chemical composition of the crop at ensiling is used to anticipate the chemical composition of the silage and modify ration formulations to reflect it. However, this practice is spreading to commodities, particularly those commodities that are known to have high variation in their protein and/or energy content.

Professional Nutrition Assistance

California dairies are well known for their high reliance on professional nutritionists that work for the dairy. In fact, only about 50 to 60% of California dairies employ a nutritional professional, but they tend to be the larger, more progressive and more profitable dairies. The days of balancing rations on the back of an envelope using a Pearson square and a copy of the National Research Council pamphlet on the 'Nutrient Requirements for Dairy Cows' are long past. Nutrition is much more sophisticated than in the past, and the future promises more of the same.

It is a good business practice to employ a person to handle the nutritional aspects of your dairy, and base compensation on performance of the calves, dry cows and lactating cows. However there is little use in paying for the advice only to ignore it, which is more common than might be assumed. Buy the advice and use it, but if the results are not acceptable then change to another individual or group.

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