Managing and Caring for the Dry Cow

► To be successful, dairy producers must master all aspects of dairy management. Managing the dry cow is not difficult but is often neglected. How you take care of the cow during this period will affect milk production and the cow's health during the next lactation.

Dry periods are needed to replenish body condition and regenerate milk-secreting tissue. A few cases of high production without a prior dry period have been reported; however, most cows need a milk break for maximum production. Cows without a dry period produce only 75 percent as much milk as they would if allowed a 50- to 60-day dry period.

Length of Dry Period

When preparing for a dry period, begin with accurate breeding records so that a calving date can be predicted and a date can be set for drying off. With a 12- to 13-month calving interval, a dry period of 45 to 65 days is recommended. Generally, longer or shorter dry periods depress milk production in the next lactation. First-calf heifers need a maximum dry period of 60 to 65 days; older cows need fewer dry days.

The effect of the length of the dry period on production is influenced by the body condition at drying off and by feeding practices during the dry period. The high producer is more difficult to turn dry but is more likely to need her body stores replenished. Feeding practices during the dry period can greatly affect production in the next lactation.

Drying Off

The dry period consists of the following intervals:

- A drying-off time of 4 to 14 days
- A dry period of 30 to 46 days
- A precalving period of 10 to 14 days

If a cow is producing fewer than 30 pounds per day, it will not be difficult to turn her dry by abruptly ceasing to milk her. Cows producing more than 40 pounds need extra attention. Skipping some milkings by milking only once per day, for example, may help reduce milk flow, but it extends the drying-off process. Continuing to milk the cow also stimulates further milk production.

Limiting feed, especially grain, and water is very effective in reducing milk flow. When production falls to fewer than 30 pounds, discontinue milking.

After the last milking, treat all quarters with an approved dry cow mastitis treatment.

New infections indicate the presence of organisms and include both clinical and nonclinical mastitis. The subclinical form decreases milk production, precedes clinical cases, and infects other animals even though the cow appears to have no problems. Controlling mastitis must focus on the subclinical form.

Dry cow therapy not only helps prevent new infections but also is more effective in clearing up existing cases of mastitis. About 70 percent of existing infections can be eliminated using dry cow therapy. This is the only time staph infections can be cured effectively.

Studies at Auburn University indicate that there is little value in treating a dry cow more than once under normal conditions. However, if the cow is milked again after dry treatment, repeat the treatment. After turning dry, cows should be milked only if the udder remains very swollen.

Table 1. New Mastitis Infections Established at Different Times in the Dry Period	
Weeks After Drying Off	**Infections**
1	18
2	7
3	1
4	0
Weeks Before Calving	**Infections**
1	9
2	2

Note: Based on study of 106 cows at Pennsylvania State University.

Feeding the Dry Cow

The feeding program for a dry dairy cow does not have to be complex; however, feeding should occur so that maximum milk production can be obtained in the next lactation and so that metabolic disorders such as milk fever, displaced abomasum, and ketosis can be limited. Dry cows require smaller amounts of nutrients than do lactating cows. Always separate the dry cows from the milking herd.

The feeding program used depends on the condition of the cow at dry-off time. If cows are in good condition, a gain of about 100 pounds is satisfactory for Holsteins. Do not overcondition before or after the cow turns dry. Under-conditioned cows are also a problem. Cows that are too thin will need extra feed to prevent limiting subsequent production.

During early lactation, cows cannot physically consume enough feed to meet their energy requirements; therefore, body energy stores (fat) should be increased before calving and milked off later. Adding body condition is most economical during late lactation. If not accomplished during this time, then it must be done during the early dry period.

The recommended nutrient requirements for dry cows and the nutrient content of some common forages are shown in table 2. The comparison shows that forages common to most Alabama farms will not meet the needs of the dry cow without supplementation.

Corn silage is too low in protein, too high in energy, and lacking in bulk (fiber) and minerals. Supplements can be used to balance the major nutrients, but corn silage free-choice makes cows more susceptible to fat cow syndrome.

Using grass hay along with corn silage as outlined in table 3 is a good alternative. Most sorghum silage and hays in Alabama are too low in energy, protein, minerals, and vitamins, so supplementation is necessary. Several dry cow rations are shown in table 3, using feeds commonly fed in Alabama.

Although not commonly available in Alabama, alfalfa should be limited, especially during the final 3 weeks of the dry period. This will prevent high calcium intakes that predispose the cow to milk fever. Good, lush pasture may easily meet the protein and energy needs of the dry cow, but supplementation is usually needed as the pasture matures.

The type of mineral used for supplementation depends on the kind of forage fed. Except when alfalfa is fed, calcium and phosphorus are usually needed in the early dry period. Dicalcium phosphate and possibly limestone are often needed with corn silage, sorghum silage, and grass hays. Calcium should be limited in

Table 2. Nutrients of the Dairy Cow Compared with Nutrient Content of Typical Alabama Forages (Dry Matter Basis)

Nutrients[1]	TDN	NE_L	Crude Protein	Calcium	Phosphorus
Dry Cow Requirements	56	.52	11	.45	.24
Forages[2]					
Corn silage	70	.66	7-9	.24	.23
Coastal Bermudagrass hay	56	.49	9-13	.49	.20
Tall Fescue hay	53	.51	9-15	.58	.23
Sorghum silage	54	.50	6-8	.64	.24
Sudan silage	53	.49	9-12	.50	.30
Ryegrass pasture (lush)	65	.70	13-24	.62	.40

[1] NE (lactation) is megacalories per pound. Other nutrients are given as percentages.
[2] Forages vary widely in nutrient content due to such things as maturity and harvesting techniques.

Table 3. Example Rations for Dry Dairy Cows

	Ration Number[1]						
	1	2	3	4	5	6	7
Ingredients[2]	Estimated Intake Per Cow Per Day (pound)[3]						
Good grass hay	-	12	23	-	9.0		
Average grass hay	11	-	-	20	-	8.0	
Corn silage	32	32	-	-	-	-	32
Grain sorghum silage	-	-	-	-	33	33	
Alfalfa hay	-	-	-	-	-	-	14
Ground corn	-	-	3.0	4.5	3.0	3.5	
Soybean meal (48%)	2.8	1.5	0.3	2.5	1.5	2.5	
Minerals[4]							
Trace mineral salt	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Dynamate[5]	0.15	0.15	0.12	0.12	0.12	0.12	
Limestone	0.05	0.05	0.05	0.05	0.05	0.05	
Dicalcium phosphate	-	-	0.09	-	0.09	0.09	
Vitamin mix[6]	+	+	+	+	+	+	+

[1] Nutrients provided are based on 1978 NRC recommendations for dry cows. See table 2.
[2] Nutrient composition of forages vary and amounts should be adjusted based on analyses. Nutrient composition (CP, TON, and NElact on dry matter basis, respectively) are as follows: good grass hay: 12.0, 58.0, 0.59; Avg. grass hay: 7.5, 52.0, 0.51; corn silage (35% DM): 7.5, 68, 0.70; grain sorghum silage (35% DM): 8.0, 56, 0.57; alfalfa hay: 17.5, 58, 0.59.
[3] Intake at about 24 pounds dry matter. Feed free-choice with this ratio.
[4] Other mineral packages may be satisfactory if nutrient levels provided are similar. Calcium should be decreased the last 2 to 3 weeks of the dry period. Include selenium if possible.
[5] Trade name for double sulfate of magnesium and potassium.
[6] Provide a vitamin package to supply 30,000 to 50,000 International Units of vitamin A per day. Addition of 5,000 to 10,000 ISP units of vitamin D and 30 to 50 IU of vitamin E may be included. Niacin additions (6 grams/cow/day) may be desired the last 10 days of the dry period if ketosis is a problem.

the last 3 weeks before calving. Trace minerals are seldom needed, but trace mineral salt can be supplied as insurance.

Adding minerals to the feed is preferable, but free-choice feeding of a mixture is often the only practical feeding method. A commercial mineral is a simpler choice if you buy one that has adequate levels of calcium and phosphorus.

Vitamin deficiencies are very rare except when poor quality (colorless), vitamin-A-deficient forage is fed. Silages vary in vitamin A depending on the color remaining at ensiling. Green pasture and green, leafy hay normally provide enough vitamin A, but heavy losses can occur when hay is stored for more than 6 to 9 months.

Commercial vitamin packages can be mixed with feed. Also, many commercial minerals contain vitamins. A recommended guideline is to supplement 30,000 to 50,000 international units (IU) of vitamin A per day.

Feeding During the Late Dry Period

For dry cows in good condition, it is not economical to add concentrates above those shown in table 3. However, a higher grain level should be fed before calving so the rumen microflora will be adjusted to the high grain ration the cow will receive from calving. During the final 10 days before calving, increase the grain so the cow is eating ½ to 1 pound per 100 pounds of body weight by calving.

To reduce milk fever, the grain mix should have less calcium than in the normal lactating cow mix.

Metabolic Problems

Displaced abomasum has become an increasing problem with high grain feeding and finely chopped forage (silage). Incidences are higher when liberal grain feeding causes the cow to become too fat. Feeding some long hay and/or pasture in a balanced ration is recommended, especially in the dry period. Typical symptoms of displaced abomasum include reduced feed intake, lower milk production, weight loss, and

secondary ketosis. These symptoms resemble ketosis; a skilled veterinarian is usually required for diagnosis and treatment.

Milk fever occurs at calving or in early lactation when the cow cannot mobilize calcium from the bone as fast as it is secreted in the milk. Starting this calcium-releasing mechanism can reduce milk fever. This is done by feeding a low calcium ration for 2 to 3 weeks before calving. This low-calcium regime causes the cow to start pulling calcium from the bone reserves early enough to prevent most problems.

Intravenous injections of calcium gluconate are used as a treatment for cows with milk fever. Follow your veterinarian's instructions for use and get professional help if the animal does not respond.

After calving, the cow must receive a balanced ration with adequate calcium and other nutrients. Most Alabama forages are low in calcium; however, phosphorus may be relatively high if a large volume of grain is fed.

Very wide or very narrow ratios of calcium to phosphorus during lactation increases the incidence of milk fever in the subsequent lactation. A ratio of about 2 to 1 is recommended in the total ration. Be sure the absolute amounts are enough to meet requirements.

Retained placenta is a complex problem with many causes, making it difficult to identify the specific cause. Fetal membranes are considered retained when they are not released by about 12 hours after calving. This routinely occurs in about 10 percent of the cows, but the incidence may be higher. Several factors increase the chance of retained placenta, including calving problems, long or short gestations, and several diseases including brucellosis, BYD, IBR, LEPTO, Hemophilus, and blue tongue.

Fat cows have higher incidences of retained placentas. Deficiencies of vitamin A and selenium may also cause problems. Selenium additions at 0.1 parts per million (ppm) in the feed or selenium-vitamin E injections (3 weeks before calving) have been helpful in areas that are selenium deficient or when buying feeds from deficient areas. Placentas retained longer than 2 to 3 days may require medical attention. Manual removal and inserting antibiotic boluses into the uterus on a routine basis are not recommended. Check with your veterinarian.

Ketosis is a metabolic disorder in which several normal body compounds are found in high concentrations in the blood, urine, and milk. Loss of appetite, lower milk production, and either dullness or nervousness are symptoms of ketosis. Hormone therapy, intravenous injections of glucose, and, at times, drenches or feeding of propylene glycol may be used. Check with your local veterinarian for a protocol to be used on your operation.

Avoiding excess fattening during the dry period, providing adequate concentrates in early lactation, and providing good forage should help prevent ketosis. Niacin has been effective in preventing ketosis when fed at 6 grams per day. Feed niacin from 10 days before calving through 10 weeks of lactation.

Fat cow syndrome has been associated with increased incidences of displaced abomasum, milk fever, ketosis, mastitis, and retained placenta. Fat cows often have reduced milk production and are more susceptible to infections. Such cows are less responsive to treatment, and the rate of death loss is high.

Maintaining a balanced ration, limiting corn silage, and providing exercise are good measures for preventing fat cow syndrome. Do not overreact to cautions about fat cows to the extent that cows calve thin. Under-conditioned cows may be as subject to poor production and disease problems as are fat cows. Keep cows in good condition with adequate flesh, not grossly fat or thin.

Udder edema occurs when fluid collects in the udder at calving time, especially in heifers. Problems caused by edema vary from difficulty in milking to extra stress on the udder support mechanism. Mastitis is a secondary complication.

Although salt intake remains debatable as a cause of edema, only about 1 to 2 ounces of salt per day is recommended. Several diuretics are available. Use these with caution and only as recommended to avoid excess dehydration.

Hardware disease is not necessarily a calving problem, but it often occurs shortly after calving. With corn silage and/or totally confined herds, the incidence of hardware disease is low. Hardware disease continues to be a problem on operations with pasture and hay as well as total mixed rations (TMR) rations where augers or metal conveyors are involved, although it is a preventable problem. Careful cleaning around fences and farm buildings is important. With more wire-tied hay coming into the state, be more cautious and consider using magnet implants in your cattle.

Calving Time

Provide a clean, sanitary, quiet environment at calving time. When weather permits, calve in a well-drained pasture. During bad weather, provide a well bedded stall of about 120 square feet. Always check the cow on a routine basis.

After calving, increase the amount of grain gradually by 1 to 3 pounds per day until at full feed or until requirements are met. Due to the high susceptibility of mastitis, milk out the cow completely in the first milking after calving and every milking thereafter. Milking a cow before calving is not recommended except in rare cases such as extreme mastitis or edema. Also, remember that the calf needs colostrum and milking before calving seriously limits available colostrum for the calf. Incomplete milking after calving is not recommended.

In conclusion, adhere to the following guidelines to properly manage and care for the dry cow:

- Adjust feed in late lactation to obtain adequate body condition.
- Dry cows off abruptly. Use a dry cow mastitis treatment in all quarters. Provide a 45- to 60-day dry period.
- Separate dry cows from the milking herd. If possible, have two groups of dry cows to adjust feed needs.
- Feed a balanced ration to provide adequate body condition and to limit excessive fattening. Feed long hay and/or pasture when possible. Limit corn silage and provide exercise.
- Routinely observe dry cows for problems and watch closely at calving. Provide a clean, dry place for calving.
- Increase grain allotments before calving to adapt the cow to a high-grain ration.

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