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 health during the next lactation.

Dry periods are needed to replenish body stores and to 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 will 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 interval, a dry period of 45 to 65 days is recommended. Generally, longer or shorter dry periods will depress milk production in the next lactation. First-calf heifers need the maximum dry period (60 to 65 days) while 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: 1) the drying-off time of 4 to 14 days; 2) the dry period of 30 to 46 days; and 3) the pre-calving period of 10 to 14 days.

If a cow is producing less than 20 pounds per day, it will not be difficult to turn her dry by abruptly ceasing to milk the animal. Cows producing more than 35 pounds need extra attention. Skipping some milkings (for example, milking once per day) 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 the milk flow. When production falls to less than 20 pounds, discontinue milking.

**Feeding The Dry Cow**

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

The feeding program 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 over-condition 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.

Cows can't be fed enough energy in early lactation; therefore, body energy stores (fat) should be increased before calving and milked off later. Adding body condition is most economical during the late lactation. If not accomplished during this time, then it must be done during the dry period.

The recommended nutrient requirements for dry cows and the nutrient content of some common forages are shown in Table 2. By comparing these, you can see 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 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 for dry cows, 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.

### Table 2. Nutrient Requirements Of The Dry Cow Compared With Nutrient Content Of Typical Alabama Forages (Dry Matter Basis).

<table>
<thead>
<tr>
<th>Nutrients1</th>
<th>TDN</th>
<th>NEL</th>
<th>Crude Protein</th>
<th>Calcium</th>
<th>Phosphorus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Cow Requirements</td>
<td>56</td>
<td>.57</td>
<td>12</td>
<td>.39</td>
<td>.24</td>
</tr>
<tr>
<td>Forages2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corn silage</td>
<td>70</td>
<td>.73</td>
<td>6-8</td>
<td>.27</td>
<td>.20</td>
</tr>
<tr>
<td>Coastal hay</td>
<td>52</td>
<td>.52</td>
<td>6-8</td>
<td>.30</td>
<td>.18</td>
</tr>
<tr>
<td>Fescue hay</td>
<td>48</td>
<td>.49</td>
<td>5-7</td>
<td>.30</td>
<td>.26</td>
</tr>
<tr>
<td>Sorghum silage</td>
<td>55</td>
<td>.56</td>
<td>6-8</td>
<td>.32</td>
<td>.18</td>
</tr>
<tr>
<td>Sudan silage</td>
<td>50</td>
<td>.51</td>
<td>6-7</td>
<td>.50</td>
<td>.30</td>
</tr>
<tr>
<td>Ryegrass pasture (lush)</td>
<td>66</td>
<td>.65</td>
<td>21-25</td>
<td>.62</td>
<td>.34</td>
</tr>
</tbody>
</table>

1NE (lactation) is megacalories per pound. Other nutrients are given as percentages.

2Forages vary widely in nutrient content due to such things as maturity and harvesting techniques.

### Table 3. Example Rations For Dry Dairy Cows.

<table>
<thead>
<tr>
<th>Ingredients3</th>
<th>Ration Number1</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good grass hay</td>
<td>—</td>
<td>12</td>
<td>23</td>
<td>—</td>
<td>9.0</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Average grass hay</td>
<td>11</td>
<td>—</td>
<td>—</td>
<td>20</td>
<td>8.0</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Corn silage</td>
<td>32</td>
<td>32</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>32</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Grain sorghum silage</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>33</td>
<td>33</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Alfalfa hay</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Ground corn</td>
<td>—</td>
<td>—</td>
<td>3.0</td>
<td>4.5</td>
<td>3.0</td>
<td>3.5</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Soybean meal (48%)</td>
<td>2.8</td>
<td>1.5</td>
<td>0.3</td>
<td>2.5</td>
<td>1.5</td>
<td>2.5</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Minerals4</td>
<td>—</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>

1Nutrients provided are based upon 1978 NRC recommendations for dry cows. See Table 2.

2Nutrient composition of forages vary and amounts should be adjusted based upon analyses. Nutrient composition (CP, TDN, 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.

3Intake at about 24 pounds dry matter. Feed free-choice with this ratio.

4Other 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.

5Trade name for double sulfate of magnesium and potassium.

6Provide 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 type of mineral used will depend 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 the last three 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 which 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 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 1/2 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. At 3 to 4 weeks before calving, run first-calf heifers through the parlor several times with the regular milking herd to adjust them to that environment.

**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, loss of weight, 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. By starting this calcium releasing mechanism, milk fever can be reduced. 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 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 (brucellosis, BVD, IBR, LEPTO, hemophilus, blue tongue).

Fat cows have higher incidences of retained placentas. Deficiencies of vitamin A and selenium may also cause problems. Selenium additions (0.1 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.

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.

*Udder edema* occurs when fluid collects in the udder at about 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 1/2 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. On operations with pasture
Fat cows 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 the fat cow. Keep cows in good condition with adequate flesh; not grossly fat or thin.

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 (extreme mastitis or edema). Also, incomplete milking after calving is not recommended.

Remember...
• 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.