

Dry Cow Feeding and Management



A dry cow in good condition. The ribs are well covered but there are no patchy fat deposits in the brisket or flank.



A dry cow carrying too much condition. Notice the fat deposits in the brisket and flank areas, and the fatty thickness around the withers and rump.

Cows should calve approximately every 12 months in order to maintain an economical level of milk production. Since cows are usually milked 305 days, a 60-day dry period completes the 12-month calving interval. Data from Dairy Herd Improvement Association records show that cows produce more milk per year when dry 40 to 70 days than when they are dry shorter or longer periods. A longer dry period will increase production in the following lactation, but lifetime milk production will be less. Also, research shows that when cows are not allowed a dry period they will produce only 75 percent as much milk in their second lactation and 62 percent as much in their third lactation as cows with a 50- to 60-day dry period. This is because the udder needs time to regenerate its milk-secreting tissue before the demand of a new lactation. In order to insure that each cow gets an adequate dry period, you must keep breeding records.

The dry period consists of three distinct entities: the drying off period (4 to 14 days); the dry period (30 to 46 days); and the pre-calving period (10 to 14 days). To be most effective, dry cows

should be in these three distinct groups. If the herd you manage is small, you may find this many groups prohibitive, and other management practices will be needed to accomplish an effective program.

Drying off procedure

The drying off process should take 4 to 14 days at the end of lactation. Dry off cows with healthy udders abruptly. Infuse antibiotic in all quarters following the last milking, then dip teats with an accepted disinfectant.

At this stage of the dry period, when milk is still in the udder, cows are very susceptible to new infections. Therefore, it is particularly important to keep these cows in clean corrals.

Aim the feeding program during this period at stopping milk production rather than meeting nutrient requirements. Eliminate grain, good quality legume forage, and corn silage from the ration and replace by lower energy forages such as grass hay or oat hay.

Watch cows closely until their udders do not contain milk. Those developing hard, swollen quarters should be returned to the barn to be milked

out, infused with an antibiotic, and the teats dipped.

Mastitis and other treatments

Treat cows with udder infections with a specific antibiotic infusion at the start of the dry period. Long-lasting antibiotics are licensed to be used only on dry cows. When used properly they offer the best chance of curing mastitis. You should work out an udder health program with your veterinarian—one that will improve or maintain udder health.

Also during this period, give vaccinations such as salmonella and clostridium perfringens C and D. These vaccines will immunize the cow, resulting in the production of antibodies which will protect the calf through the colostral milk. Be sure to read the directions carefully on all vaccines or medicines, as some attenuated live virus vaccines and some drugs can cause abortion.

The dry period

Once milk secretion ceases, managing dry cows becomes less critical. However there are certain feeding practices that will minimize metabolic diseases such as milk fever, ketosis, or displaced abomasum. Table 1 shows the recommended nutrient content of a dry cow ration compared with a high producing cow.

Table 1. Recommended Nutrient Content of a Dry Cow Ration Compared With a High-Producing Cow.

	Dry matter basis			
	Dry cow		High-producing cow	
Crude protein, min.	11.0	%	16.0	%
Total digestible nutrients, min.	60.0	%	75.0	%
NE _l , min. ¹	.61	Mcal/lb	.78	Mcal/lb
Crude fiber, min.	17.0	%	17.0	%
Calcium, min.	.37	%	.60	%
Phosphorus, min.	.26	%	.40	%
Calcium to phosphorus ratio	1.5:1 to 2.5:1		1.5:1 to 3:1	
Magnesium, min.	.16	%	.20	%
Sulfur, min.	.17	%	.20	%
Iron, min.	50.0	ppm	50.0	ppm
Manganese, min.	40.0	ppm	40.0	ppm
Zinc, min.	40.0	ppm	40.0	ppm
Copper, min.	10.0	ppm	10.0	ppm
Cobalt, min.	0.1	ppm	0.1	ppm
Iodine, min.	0.5	ppm	0.5	ppm
Selenium, min.	0.1	ppm	0.1	ppm
Vitamin A, min.	1450	IU/lb	1450	IU/lb
Vitamin D, min.	140	IU/lb	140	IU/lb

Source: Nutrient Requirements of Dairy Cattle, 5th Revised Ed., 1978. National Academy of Sciences—National Research Council, Washington, D.C.

¹ NE_l, min. is abbreviation for net energy for lactation, minimum. Meal/lb means megacalories per pound of feed.

The energy concentration for the dry cow ration should be low compared with the lactating cow to keep the dry cow from becoming too fat. Most cows in well managed herds will finish their lactation in good condition because they gain weight in late lactation. Research shows a milking cow will gain weight more efficiently than a dry cow. You, as a dairy manager, can save feed and money by feeding cows to gain body condition during the last 3 or 4 months of lactation.

If cows are in good body condition when turned dry, feed them to gain only a small amount of weight to allow for the growth of the fetus. A gain of 1½ lbs. per day (90 to 100 pounds during a 60-day dry period) is adequate. Give thin, dry cows extra feed to attain proper body condition by calving time.

Avoid overfeeding grain or high energy forages such as corn silage during the dry period, as this will over-condition cows and will cause certain metabolic disturbances:

► *Ketosis*—Fat cows often have poor appetites following calving and this predisposes them to ketosis. Ketosis causes rapid loss of body weight and greatly reduces milk production. Be advised, however, that dry cows should not be underfed so that they lose body weight, as this also can cause ketosis and low milk production. Observe the condition of dry cows frequently and adjust the feed ration accordingly. Professional nutritional guidance is advised if problems develop.

► *Displaced abomasum*—Cows fed liberal amounts of grain or corn silage shortly before, or after, calving are subject to a condition where the true stomach (abomasum) usually migrates to the left side of the rumen, or occasionally migrates to the right or becomes twisted, causing partial blockage of the digestive tract. This condition usually occurs within 2 weeks of calving. Feeding long hay in preference to cubes, pellets, or silage will help prevent it. Do not feed high levels of low-fiber grains and other concentrates before calving.

► *Fat-cow syndrome*—The result of high energy feeds during prolonged lactations or the dry period, fat cow syndrome is characterized by poor appetite and poor production. Some cows actually die from this disease. Postmortem examination would show a pale, fatty liver. Those that do not die usually have poor appetites, lose weight, produce less milk, are more susceptible to metabolic disorders and infectious diseases. Generally these cows respond poorly to treatment.

► *Milk fever or parturient paresis*—When low blood calcium occurs it causes a paralysis of cows that nearly always occurs within 72 hours of calving. Raising the level of calcium in the dry



A cow that has calved and is in condition to produce a large quantity of milk efficiently.

cow diet, however, may be harmful. Both research and experience show cows fed an adequate but not excessive amount of phosphorus (P) and a low level of calcium (Ca) during the dry period have less milk fever. Alfalfa or legume hay or silage, because of its high level of calcium, is not desirable as the only forage for dry cows. Attempting to balance the Ca/P ratio of alfalfa hay during the dry period with minerals alone is generally unsuccessful. Usually, you can attain a desirable level of calcium in the dry cow ration by diluting the alfalfa with nonlegume forages, such as oat hay. A mixture of $\frac{1}{3}$ oat hay, $\frac{1}{3}$ corn silage, and $\frac{1}{3}$ alfalfa is a desirable forage mixture for dry cows.

Minerals and vitamins

Phosphorus is low in most of the forages produced in the United States. You should either add it to the concentrate, or feed it free choice. Adding phosphorus to the concentrate is a more positive way to insure adequate intake. Low phosphorus intake is associated with milk fever, downer cow syndrome, retained placenta, and anestrus (no heat) following calving. Since little or no grain is fed to dry cows, you should feed a mineral mix that is high in phosphorus, free choice. Feeding experiments indicate excellent milk fever prevention is obtained when the calcium to phosphorus ratio is 1:2 in the dry cow ration. However, it is often difficult and expensive to achieve this. Milk-fever control has been good when the phosphorus level meets the nutrient requirement and the calcium to phosphorus ratio does not exceed 2:1. (See Table 1).

Limit salt to dry cows, as excessive salt intake is associated with udder edema (caked udder).

Do not mix with other minerals during the dry period, because of the possibility of excessive intake.

Trace minerals are also needed for health and reproduction. Those trace minerals especially associated with reproduction are iodine (deficiency causes goiter in calves), manganese (crooked calf syndrome), and selenium (retained placenta and white muscle disease in calves).

Dairy cows require a dietary source of fat-soluble vitamins—A, D, and E. Other vitamins can be made by the rumen bacteria or the cow's body in adequate quantities. A deficiency of vitamin A is associated with poor maintenance of the membrane linings of the body, thus exposing animals to disease.

Vitamin D, with adequate calcium and phosphorus, insures proper bone growth and prevents rickets in the calf. Thirty million units per day of vitamin D for 5 to 7 days before calving have been used to prevent milk fever, but may cause harmful calcium deposition in soft tissues if continued longer. Accurate prediction of calving dates is essential for this method to work.

If rations are low in selenium, intramuscular injection, 20 days before calving, of 50 mg of sodium selenite and 680 IU of alpha tocopherol acetate (commercial preparation) can help reduce the chances of a retained placenta. Research in herds with a high incidence (more than 10 percent) of retained placentas showed the injections brought marked improvement in this problem. This same commercial preparation will prevent white muscle disease in the newborn calf, and may help reduce the number of weak calves. Recently the Food and Drug Administration cleared selenium for feeding to dairy cows at the rate of 0.1 ppm in the total ration.

Management practices

The dry period is an excellent time to treat dairy cattle for both internal and external parasites, if treatment is needed. Most worming medicines, if fed to the lactating cow, require that milk be withheld from the market. By treating during the dry period this loss is avoided. Also, external parasites such as lice or ringworm, cause discomfort and disease, so their elimination is desirable.

Pre-calving time

The third phase of the dry period commences 10 to 14 days before the estimated calving date. At this stage of the dry period, move the cows to a clean corral and condition them for calving. This will include management practices for sanitary

milk production, such as clipping the udder and flanks.

As a cow approaches within a few days of calving, move her to a separate clean calving pen where you can observe her closely. Cleanliness at this time will reduce coliform mastitis, which can occur before freshening, and will insure calf health and minimize uterine infection.

Lead or challenge feeding

Lead feeding is a practice that has been successful for many producers. Starting about 14 days before calving, gradually increase grain-concentrate feeding up to a maximum of 1 percent of the cow's body weight. This allows the microorganisms in the rumen to adjust to the milking ration and allows the cow to reach high production more quickly.

Grouping dry cows for challenge feeding is a problem in small or medium sized herds. One sug-

gestion is to put them with the lower producing cows when the herd is separated according to production. This will allow the dry cows to get some grain.

Cows with chronic mastitis, pendulous udders, a history of calving problems, or obesity should not be challenge fed. These types of animals can be forced into health problems by heavy feeding at this time.

Statistics show that cows suffer the most from injuries or diseases during the period from calving to 6 weeks following calving. Proper feeding, sanitation, and management will lessen these problems and enhance profit.

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A Western Regional Extension Publication

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Henry Wadsworth, director, Oregon State University Extension Service. Other western states Extension directors include James W. Matthews, University of Alaska; Darrel Metcalfe, University of Arizona; J. B. Kendrick, Jr., University of California; Lowell H. Watts, Colorado State University; William R. Furtick, University of Hawaii; James L. Graves, University of Idaho; Carl J. Hoffman, Montana State University; Dale W. Bohmont, University of Nevada; L. S. Pope, New Mexico State University; Clark Ballard, Utah State University; J. O. Young, Washington State University; and Harold J. Tuma, University of Wyoming. The University of Guam Extension Service, Wilfred P. Leon Guerrero, director, also participates. Extension invites participation in its programs and offers them to all people without discrimination.