

# Managing Cows for Higher Fertility

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## Introduction

Good fertility in dairy cows is important for profitable dairying. Fertility can be measured in several ways, but broad simple goals for reproductive performance are best for focusing on overall herd performance. Targets for overall herd reproductive performance are:

1. AI-sired heifers should calve at near 24 months of age.
2. Cows should calve without complications and start cycling by 4 weeks postpartum.
3. Cows should be bred at first and any subsequent heat beyond 50 days postpartum.
4. Calving interval for the herd should be 12 to 13 months.
5. At least 90% of the cows should breed back to produce another calf.

## Grouping Cows for Reproductive Management

It is useful to group cows according to reproductive status in order to manage fertility more efficiently. Grouping includes physical separation of cows into their appropriate groups in large herds where the number of cows and physical facilities permit such separation. Grouping also includes separation of records into the appropriate reproductive categories in smaller herds where number of cows and physical facilities do not permit physical separation of cows. In many herds, some combination of grouping cows and records is appropriate for efficient management of fertility.

If grouping is to be used for reproductive management, the following groups should be considered:

1. Dry cows; one to three groups depending on herd size.
2. Open cows; one to three groups depending on herd size.
3. Pregnant cows; one or more groups depending on herd size.
4. Problem cows; cows open over 100 days postpartum. These cows may be housed with open cows, but the record system should indicate that they are in the "problem" category.

**In all herds, regardless of size, dry cows should be separated from lactating cows. Management procedures and nutritional requirements for dry cows differ sufficiently from those of lactating cows so that it is not easy to manage these cows unless they are physically separated.**

Most modern, computerized record systems allow for an

almost infinite number of grouping categories. In most cases, grouping according to reproductive status is closely related to grouping according to milk yield. Therefore, cows within a common reproductive group will have similar nutritional and health requirements and can be fed and managed to promote optimum milk yield and good health.

## Good Fertility Starts with Dry Cow Management

Fertility of cows after calving is closely linked to their management during the dry period. If proper care is not given to dry cows, then fertility is likely to be lower after freshening. The following procedures lead to healthy dry cows and therefore to better fertility after calving:

1. Treat all four quarters of each cow with an approved dry cow antibiotic at drying off. New infections occur at a higher rate during the dry period, and cows that calve with mastitis are likely to have lower fertility after calving. Cows that have had high somatic cell counts during a prior lactation may need a second dry cow treatment 7 to 10 days after the first treatment.

2. Trim the feet of all cows at drying off. This is especially important for cows that are housed on concrete during lactation. Good foot care during the dry period will reduce foot problems after calving. Foot problems during lactation reduce fertility.

3. Separate dry cows from the milking herd, and if possible, house them on pasture or well-drained dirt lots during the dry period. In larger herds, the dry cows may be divided in two to three groups.

4. During the early dry period, reduce dry matter intake by feeding a high fiber ration with no concentrate or a restricted amount of concentrate. If possible, avoid high-moisture feeds and limit the amount of protein to no more than about 12% of the total ration. Limit the amount of calcium and phosphorus during the dry period. Long-stem, medium quality hay is probably the best feed for dry cows during the early part of the dry period.

5. Provide limited shelter from cold and rainy weather. Provide shade during the summer. Dry cows are able to withstand inclement weather very well, but close-up dry cows may need shelter to prevent frozen teats if the temperature is extremely cold.

6. During the middle and late parts of the dry period, cows should receive appropriate vitamin and mineral supplementation, but excess concentrate intake should be avoided.

Injections of selenium and Vitamin E during the dry period are recommended in areas where a selenium deficiency is known to exist. As cows approach the expected time of calving, they should be gradually shifted to the lactation ration, but intake should not exceed about 2 to 2.5% of the cow's weight. Maintaining high quality fiber in the dry cow's diet is important.

7. Calve cows in the **cleanest** location on the farm. We prefer to calve cows in a clean pasture or well-drained lot if weather permits. Otherwise, provide a well-bedded stall. If possible, the bedding should be straw rather than wood shavings or sawdust. The beneficial effects of good care during the dry period can be offset by calving the cow in an unclean, dirty area.

8. Provide assistance at calving only if labor is prolonged and complicated. Herd personnel need to be taught how to provide proper assistance during delivery. Patience is very important at calving time.

9. Make sure that the newborn calf gets colostrum by force feeding if necessary.

### Handling the Fresh Cow

Fresh cows should be provided with an environment that includes dry bedding, clean alleys, and high quality feed. The reproductive tract of fresh cows is easily infected, so sanitation in the fresh cow area is important. Cows that have retained fetal membranes should be monitored closely by watching for a drop in milk yield, a loss of appetite and an increase in temperature. If any of these conditions occur, systemic antibiotics are indicated. Postpartum infusion of cows with retained placentas have not proven to be effective in reducing infections. In fact, some research suggests that postpartum infusions actually reduce the phagocytic response in the uterus and thereby delay correction of the problem.

Cows need to be fed so that they attain maximum dry matter intake as soon as possible after calving. We prefer to use a total mixed ration for all cows so that their diets can be designed to meet their requirements. Such rations prevent cows from picking and choosing from among available feedstuffs. Cows express considerable variation in what they will eat, and therefore will not balance their ration if given a choice. Quality of fiber in the fresh cow's diet is important to promote high production and good health. Avoid rations that are too high in moisture and too low in effective fiber, because these rations will not lead to maximum dry matter intakes and may cause acidosis problems. Blended rations with 18 to 20% crude protein are adequate for fresh cows, and excess protein intake should be avoided because it is costly and may, in some instances, lower conception rates. In general, good feeding programs for fresh cows will allow cows to milk at high levels without experiencing serious drops in milk fat percentage. If fat percentage drops severely, this is likely to be accompanied by an increase in foot problems and lower fertility. Feedstuffs such as whole

cottonseed are ideal for fresh cows because they contain high quality fiber, high amounts of energy and slowly degradable protein. The goal in feeding fresh cows is to get these cows into a positive energy balance state as soon as possible without making them go off feed. This requires great care in monitoring the feeding program.

In larger herds, it is often desirable to separate first-calf heifers from older cows because their nutritional requirements and lactation curves differ.

### Start Breeding at First Heat Beyond 50 Days

Several studies have shown that there is a close relationship between average interval to first insemination and average days open (Table 1, Britt, J. Dairy Sci. 60:1345, 1977). In general each one day reduction in interval to first breeding results in a .7 to .8 day reduction in days open. Most cows that calve without complications are ready to be bred back at first detected heat beyond 50 days postpartum. The reproductive tract in fresh cows should be examined regularly until involution is completed, and then the cow should be designed as ready to breed. Conception rates tend to increase up to about 60 to 80 days postpartum and then remain relatively constant.

TABLE 1. Reproductive Performance of Cows First Inseminated At Various Intervals After Calving.

Item	Days to first insemination after calving					
	<40	41-60	61-80	81-100	101-120	>120
Conception rate at first service (%)	47	45	60	56	63	69
Services per conception	2.1	1.9	1.7	1.6	1.6	1.4
Days open	78	87	97	115	126	154

### Vaccination Programs

Vaccination programs vary considerably among regions and among herds within a region. It is best to design the vaccination program for herds based on diseases prevalent in the area and on whether outside cows or heifers are introduced to the herd on a regular basis. It should be recognized that vaccinations are not 100% effective in controlling diseases, so good sanitation and disease control practices should complement the vaccination program. In herds where natural service is used, it is important to vaccinate against those diseases that might be transmitted by the bull, especially if the bull has not been given a breeding soundness exam.

### Foot Problems and Reproduction

McDaniel and colleagues (J. Dairy Sci. 67, Suppl. 1:198, 1984) showed that cows with long hooves and shallow angles

of the hoof had lower stayabilities and more days open. These relationships are probably greater if the cows are housed continuously on concrete. A good foot care program will help keep fertility at a higher level. Regular trimming and use of a foot bath during lactation are important steps for preventing lameness associated with foot problems.

Lesions on the bottoms of the feet may not be noticed without regular examinations, and therefore may not be obvious until the condition becomes more serious and results in lameness. Cows with sore feet are more difficult to detect in heat and probably have lower conception rates because of clinical or subclinical infections.

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