

**DISPLACED ABOMASUM, KETOSIS,
METRITIS, MASTITIS
AND RETAINED PLACENTA**



The fat cow syndrome, which most frequently develops during the dry periods, is a major contributor to post-calving disorders.

Post-Calving Disorders Related to Feeding

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Displaced Abomasum

Displaced abomasum (DA) is a disorder of cattle in which the abomasum (fourth or true stomach) becomes distended with gas, fluid or both, and migrates to an abnormal position in the abdominal cavity. The abomasum most commonly moves to the left and upward toward the backbone coming to rest between the rumen and the abdominal wall on the left side.

The incidence of displaced abomasum in dairy cattle has increased dramatically in recent years. Displaced abomasum occasionally occurs in bulls and heifers, but 86% of the DAs occur in cows within two weeks of calving. Although probably not the cause of DA, pregnancy, the act of calving, or the conditions associated with calving must certainly be considered as predisposing factors.

The cow with a displaced abomasum closely resembles a cow exhibiting the signs of acetonemia or ketosis: she is usually off feed, although she may eat intermittently. Her bowl movements are usually scant and soft or pasty. Temperature remains normal. Milk production tapers off, and the cow appears dull, listless and gaunt. The normal rumbling sound of rumen movements heard by pressing the ear to the left flank will be absent or replaced by a "ping" from gas bubbles in the abomasum.

One out of every eight cases involves a right abomasal displacement or torsion and both the clinical signs and outcome differ from those described above. When torsion (twist) accompanies right DA, milk production drops sharply, the animal refuses to eat, is depressed and tends to have a fetid, watery diarrhea.

The treatment of these conditions usually involves surgery; the abdominal cavity is opened, the displacement corrected, and the abomasum sutured into its normal position so the displacement cannot recur. In some instances, surgical intervention and correction of the displacement without suturing may be all that is indicated. "Rolling" a cow is a more conservative method of treatment, which some veterinarians use quite successfully; however, the likelihood of recurrence is greater. Cows suffering stress, fat cow syndrome, or other complicating conditions such as liver or kidney failure do not respond well to treatment or surgery.

Feed Practices Affect Incidence of DA

A high proportion of concentrate (grain mix) in the ration of the dry cow and immediately after calving substantially increases the incidence of displaced abomasum. Abomasal stasis, poor motility and increased gas production in the abomasum have been demonstrated in cows that were fed high levels of grain. Experimentally reduced abomasal contractions also occur when the volatile fatty acids produced in the rumen of cows fed high grain rations are injected into the abomasum of other cows. Increasing too rapidly the amount of grain fed can also produce an acid rumen and temporary off-feed condition.

In a study at Purdue University, cattle were fed different proportions of concentrates for 4 weeks before calving and throughout the following lactation period. The roughage consisted of one-half alfalfa haylage and one-half corn silage (on a dry-matter basis). There were no DAs in cows fed a ration con-

sisting of 75% roughage and 25% concentrate. However, the incidence of DAs was 16% among cows receiving 40% concentrate and increased to 40% DAs among the cows receiving either 55% or 70% concentrate.

In a California experiment, 11 cases of DA occurred in 46 cows fed a complete feed mixture, free choice, of 40% chopped alfalfa hay and 60% concentrates beginning 4 weeks before calving. Eight of the eleven displacements occurred within 2 weeks after calving. This concurs with on-farm observations that DAs occur in herds fed hay as well as when fed silage if an excess of concentrates is fed.

Metritis—Mastitis—Retained Placenta

In the Purdue study, nine of the ten cows with displaced abomasum also had metritis and five of these cows had a retained placenta. Among the 33 cows that did not have a displaced abomasum, there were only 6 cases of metritis and 8 of retained placenta. The average consumption of energy in the above experiment was from 138 to 173% of established requirements (NRC) for pregnant dry cows (see MSU Extension Bulletin E-667).

The Fat Cow Syndrome

A high incidence of metritis, mastitis, and retained placenta has been observed in herds that are excessively fat at calving time as a result of free choice feeding of high levels of grain or corn silage during the dry period. An experiment at Michigan State showed that feeding grain up to appetite, starting 3 weeks before calving, increased the incidence and severity of mastitis after calving, mammary edema and milk fever in heifers and cows—compared to controls that were fed hay only.

Maintaining the proper balance of calcium and phosphorus in the ration of the dry cow has been shown to substantially reduce the incidence of milk fever. Research suggests that 2.3 parts calcium to 1 part phosphorus in the ration of the dry cow is most desirable to avoid milk fever.

Fat cows apparently have a low resistance to infections. There is some concern that deficiencies of vitamins A, D and E, selenium and other unidentified factors during late lactation and the dry period may increase susceptibility to these conditions by affecting the integrity of the tissues, smooth muscle motility and contraction of the organs involved. On postmortem examination, the liver of cows affected with the fat cow syndrome is so heavily infiltrated with fat that it is pale in color and often will float in water.

Modern corn silage is one-half grain and one-half roughage on a dry matter basis. It is excellent feed for milk production when properly balanced with protein, minerals and vitamins. Since the level of grain in a diet affects the incidence of displaced abomasum

and the fat cow syndrome, the amount of corn silage fed to dry cows should be limited.

The physical form of forages fed may also contribute to the incidence of DAs. Extremely finely chopped silage, low fiber grass and legume forage or corn silage that has a high grain-to-stalk ratio may not stimulate rumination as well as feeds that are more fibrous. This can reduce the flow of saliva and sodium bicarbonate into the rumen permitting the ingesta flowing into the abomasum to be more acid than normal. These conditions can also occur in the rumen when relatively small amounts of grain are fed with forages which lack sufficient fibrous character. Hay normally provides the necessary fibrous condition and is relatively low in energy. It is useful in stimulating rumination in some situations and is a convenient low energy feed for dry cows.

Dairymen experiencing a high incidence of displaced abomasum, metritis, retained placenta and mastitis following calving should consider these changes in their feeding practices:

DRY COWS:

1. Separate dry cows from the milking herd so you can control their feed intake.
2. Feed only hay, haylage, or pasture (when available).
3. Feed 10 lb of hay (or equivalent as haylage) and limit corn silage to 30 lb (10-12 lb of dry matter) per head daily.
4. If corn silage is fed as the only forage, limit the intake to 1.5 lb of dry matter for 100 lb of body weight daily. This diet must be supplemented with protein, minerals and vitamins to balance the ration.
5. Avoid allowing dry cows the opportunity to become excessively fat.

AFTER CALVING:

Increase the amount of grain ration gradually (1 to 2 lb increase per cow daily) during the first 2 weeks. This will encourage cattle to increase forage intake as appetite improves and allow rumen conditions to remain normal as grain feeding is increased. Avoid sudden large increases in the amount of grain fed. Feeding 8 to 10 lb of hay may be necessary if your silage is finely chopped. Feed a minimum of 40% roughage (dry basis) in the total ration or maintain a minimum of 15% crude fiber in the total ration. Reduce the amount of concentrates fed as milk production declines during late lactation to avoid overfattening and wasting feed.

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