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Popular Article

Downer Cow Management: Overcoming Common Challenges for Optimal Recovery

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Abstract

Postpartum diseases in dairy cattle are a significant economic concern for Indian veterinary practitioners and producers. The transition period, spanning three weeks before and after calving, plays a pivotal role in determining the health and productivity of dairy animals. This critical phase encompasses various challenges and factors that require effective management. Common postcalving disorders, such as milk fever, metritis, ketosis, and mastitis, can substantially impact milk production and overall herd profitability. Therefore, managing the transition period, particularly focusing on the periparturient phase, is of utmost importance. Key aspects of successful transition cow management include maintaining adequate dry matter intake, optimizing nutrition, addressing environmental changes, and closely monitoring cow health and behavior. Furthermore, timely care for downer cows is crucial to minimize economic losses. During the three weeks postpartum, cows experience numerous changes, including calving, lactation initiation, dietary adjustments, and social adaptations. Ensuring a smooth transition during this period involves providing energy-dense rations, offering clean environments, and facilitating access to adequate space and water. In summary, effective transition cow management is essential for sustaining dairy herd health and productivity. By addressing various factors and implementing stress-reduction strategies, vigilant observation, and timely interventions, producers and veterinarians can positively influence dairy farming's profitability and success.

Introduction

Postpartum diseases are the most commonly treated problems by the Indian veterinary practitioner and is one of the single most factor causing significant economic losses to the producers, mainly landless and the poor. Generally, postpartum diseases are only symptoms or consequences of previous insults primarily occurring during the late gestation period. Many prepartum nutritional factors can be linked to an adverse disturbance of the metabolic processes in transition during this critical periparturient time period.

The transition period from prepartum (three weeks prior to parturition) to postpartum (three weeks after parturition) is a critical determinant of both productivity and profitability in a dairy animal as well as a herd. Nutrition and management programs during this phase directly affect the incidence of postcalving disorders, milk production and reproduction in the subsequent lactation.

The transition period imposes a number of abrupt changes on the cow. The cessation and initiation of lactation is one example (Kachhawaha *et al.*, 2010). The cow will also experience as many as 4 ration shifts



during this period. Rapid changes in both hormonal and metabolic systems must occur. All of these tend to increase the level of stress in the cow during this period.

The stress response mechanism in ruminants is a complex, multifaceted system. Nutrition and management alterations provide an opportunity to minimize the effects of stress. A key challenge for veterinarians is to educate dairy farmers to devote adequate resources in terms of labor, facilities and management to implement a structured transition cow program.

Critical control points to prevent periparturient metabolic disease and improve reproductive performance were identified as maximize dry matter intake, minimize negative energy and protein balance, stimulate rumen papilla, maintain calcium status and minimize immune dysfunction. If these factors can be controlled through proper nutrition and animal management then a decrease in metabolic and reproductive disease problems can be expected.

Why we fail often?

Downer or Non-ambulatory cattle are a medical emergency. **Every hour that a cow remains untreated laying on a hard surface dramatically reduces her chances of recovery. Timely care is the critical factor. However, in our farm animal practice, many a times, there is a time delay in giving immediate/earliest clinical care for downer cow.** Downer cows are expensive to maintain. In a study in well-developed dairy farm, the involuntary culling costs alone comes to \$500 to \$1,000 per cow, which does not include indirect costs such as reduced milk yield, labor and veterinary costs. Because non-ambulatory cattle cannot be marketed the cull price of \$700 to \$1,000 is also lost.

Common Disorders in Transition Cows

Post calving disorders commonly reported were milk fever, retained placenta, metritis, ketosis, displaced abomasum and mastitis. In such cows, the dry matter intake with any of the above said events was significantly lower than those cows with no problems. Cows with any of the above events produced lower milk, when compared with cows which had no problems. These differences in milk production represented only a fraction of the total economic cost of post calving disorders.

An additional consideration is the interactions which occur between disorders. A path analysis approach was used to examine these relationships were studied in detail in the past. Cows with milk fever had 4 times more risk of retained placenta and 24 times more ketosis than cows which did not have milk fever. The risk of complicated ketosis was elevated in cows which had a retained placenta, displaced abomasum or milk fever.

The challenge is to design a health management program for the transition cow to minimize post calving disorders, maximize dry matter intake and milk production. The transition dairy cow continues to be somewhat of an unsolved mystery. The veterinary communities across the world continue to learn that how cows are fed, handled and managed during the three weeks before through three weeks after calving can have a definite influence on production, health and reproductive performance.

It is known that the reproductive performance can be directly influenced by metabolic disorders, early lactation performance and nutrition. In the Indian veterinary practice, scenario, the dairy animal practitioners are responsible for helping the transition cows navigate a myriad of challenges leading up to calving through the initial weeks in the milking herd. And when properly handled, the returns in production, health and breeding



pen performance can be great.

Three weeks leading up to Calving

Research continues to show that the dry period – especially the three weeks before calving – can directly impact milk production, incidence of metabolic disorders, and subsequent reproductive performance. The three weeks prepartum are especially important because a multitude of changes are occurring all at once. These changes include:

Dry matter intake

Dry matter intake (DMI) can decline by 30 percent or more in the weeks leading up to calving. Cows that go off feed prior to calving are at higher risk for metabolic disorders early in lactation. Metabolic disorders stunt early lactation performance, which can negatively influence production levels and reproductive abilities later in lactation.

Environment

Cows are often moved to cleaner areas or sheds (which are newer to them), prior to calving for careful watch for cows that will be calving or going off feed. Multiple sheds/ area or cow pen changes can be especially difficult for cows when they are introduced to a shed / pen of new animals. The reordering of animal hierarchy can take some time and animals often eat less during this transition.

Ration changes

The rumen is undergoing major changes, as cows move from a high-forage, low-energy diet to a high-energy, low-forage diet. These changes can directly influence the rumen microbial population, so it's essential to prepare the rumen for upcoming ration changes. While it may seem difficult, the three weeks before calving boil down to one word: consistency. Monitoring cows and changes in behavior or health can identify potential problems early and allow you to make the appropriate changes.

Monitor behavior:

Watch closely for cows going off feed or showing sudden shifts in behavior. If one can work to maintain DMI during this stressful period, cows can be more easily managed for their transition into the milking string postpartum.

Minimize change

As creatures of habit, keeping the environment and animals as consistent as possible can help smooth the transition period. Minimize the shed/pen moves and reduce overcrowding to maintain DMI. Milk production, time spent lying down and rumination time all decrease as the number of cows in a pen increases.

High-quality ration:

Prepare cows for the upcoming lactation with a high-quality ration they can't resist. It is better to work with the dairy cattle nutritionist to formulate an appetizing ration that will reduce the incidence of metabolic disorders and prepare the rumen for the upcoming lactation.

Three weeks postpartum

Just as cows, experience changes during the close-up period, changes surround cows at the time of and directly following calving. These changes in circumstances including having a calf, beginning to lactate, a new ration, a new group of cows to adjust to initiate the most frequent changes in cow health and performance.

The first 60 days in milk is often when we see the largest percentage of animals leave the herd. One of the main



reasons cows leave the herd is because of metabolic disorders like ketosis, metritis, milk fever and displaced abomasums (Cox, 1982). Metabolic disorders can have a grave impact on future reproductive performance and cows that experience them will struggle to regain performance losses throughout the lactation. This often means that the additional energy from the ration is needed for daily maintenance rather than production and reproductive performance. Managing fresh cows for reproductive success should focus on providing a clean environment with a fresh, properly formulated diet in an environment with plenty of space and clean water.

Start with nutrition

By supplying an energy-dense ration that also provides rumen microbes with the nutrients they need to thrive, cows can successfully join the milking string. Because fresh cows spend at least some time in an energy-deficient state, helping to make up the difference with dietary energy is critical. Work with the experienced dairy nutritionists to formulate a ration to keep cows healthy and producing high levels of quality milk. Also ensure that this ration provides the nutrition cows need to get bred back.

Focus on environment

Much of cows' performance will depend on the environment they are placed in, which means minimizing pen moves, calculating stocking density and providing a clean, dry environment is critical for keeping cows healthy throughout the transition.

Critical Factors in the Evaluation of Transition Cows

1. Dry period length

The optimum dry period length for high producing herds is not well defined. Current recommendations are for a 50–70-day dry period. Average days dry for first lactation cows was 55 days while it was 65 days for second and greater lactation cows. First calf heifers also consistently have fewer dry days.

2. Dry matter intake

The depression in dry matter intake (DMI) in the late dry period and early lactation has been well documented. The reduction in DMI during the last week prepartum may be 30%. Feed intake post calving doesn't peak until 9-13 weeks of lactation. Dry matter intake in the first week post calving is about 65% of maximum DMI. These changes in DMI need to be accounted for in ration formulation to provide adequate nutrient intake. Adjustments in ration nutrient density will be needed to compensate for the depressed DMI in these periods. This low DMI in early lactation cows may limit the rate at which concentrate feeding can be increased post calving.

3. Feeding behavior

Feed bunk/trough space and social dominance both impact meal patterns and total DMI. The post calving cow moved into a new group needs to establish her ranking in the peck order. This move may be especially difficult for the first lactation heifers when they are put in groups containing older cows. At the same time, many of these cows may still be slightly weak and less able to compete. It appears logical to assume that any restriction in feed bunk space or availability of feed would be a negative factor in allowing the fresh cow to come on feed rapidly. Housing these cows in a special fresh cow group should minimize competition at this critical time.

4. Hormonal and metabolite shifts

The cow goes from lactating to nonlactating and back to lactating in a relatively short period of time.



This requires major adjustments within the cow. As an example, glucose needs increase about 2.7 times between late pregnancy and the first few days of lactation.

5. Rumen mucosa

It has long been known that a relationship between feed types and rumen mucosal development exists. Propionic and butyric acids are keys to mucosal development and structure. A reduction in total absorptive surface area occurred as cows were moved to the high forage dry cow ration. When cows were shifted to a high energy ration 14 days before calving, a mucosal proliferation process began. It took 4-5 weeks for the mucosa to attain maximum absorptive capacity.

6. Immune system

A number of nutrients interact with the immune system in the body. Plasma levels of vitamin A, vitamin E and zinc all decreased in the last 2 weeks before calving. Similar trends in vitamin E and selenium were noted in un-supplemented dairy cows between dry off and calving. These trends indicate a lower immune system status as the dairy cow approaches parturition. Vitamin E has direct effects on the activity of both lymphocytes and neutrophils.

The information described above provides only a base for the development of a transition cow management program. Key points can be outlined for specific portions of this phase of the lactation cycle. However, there are 3 key words that sum up the overall approach for this period. These are STRESS MANAGEMENT, OBSERVATION and REACTION.

Factors to be considered during Dry-off:

- Abrupt changes may be needed here to enhance the cessation of milk synthesis.
- Most recommendations suggest discontinuing milking abruptly.
- Dry cow treatment should be done at this time.
- Observation of the cow and udder for the first few days is critical.
- The feeding program will normally shift to high forage.
- Restrict water only if necessary.
- A change of physical facilities or location may be beneficial.

Factors to be considered during early dry period:

- Provide a balanced ration.
- The goal is to maintain body condition in the dry period.
- The cow should gain weight due to fetal growth.
- Feed a bulky forage to keep the rumen expanded and working.
- Avoid high Potassium forages (> 2.5% Potassium).
- Limit corn silage to about 1/2 of the forage dry matter.
- Provide adequate feed bunk space, feed availability and water.
- Some exercise may be helpful to maintain muscle tone.
- Clean, dry environment.
- Close-up period (last 3 weeks)
- Adjust ration density for lower DMI.



It may be good to bring in some of the post calving forages or feeds to minimize palatability problems.

- Limit grain to 0.5 - 1% of bodyweight.
- Vitamin E - selenium injection if needed.
- Avoid poorly fermented silages.
- Clean, dry environment.

Factors to be considered during Calving:

- Clean, dry environment.
- Be there to observe the calving process.
- Assist if needed but don't get over anxious.
- Don't use excessive force when assisting.
- Avoid smooth or slippery floors.
- Offer the cow water and a highly palatable feed (hay, calf starter).
- The key is to get the cow eating, drinking and ruminating.

Factors to be considered during Fresh cows:

- Observe chewing and rumination activity.
- Some producers are taking body temperatures once or twice a day on these cows.
- Make sure fresh, palatable feeds are available.
- Water should always be available.
- A separate area to house these cows is preferable. The primary reason for this is the ability to frequently observe these cows.
- Avoid crowded, competitive environments.
- Clean, dry environment.
- The first 1 - 2 weeks post calving set the stage for the entire lactation. Observation and reaction are the management keys during this time.
- Don't increase concentrate feeding too rapidly.

These suggestions are designed to minimize stress on the cow during the transition period. The goal is to get the post calving cow on feed as rapidly as possible. This requires a nutrition and management program which minimizes post calving disorders. The basics of stress management, observation and reaction are relatively simple. The ability of the farmer or manager or veterinarian in charge of the farms, to implement these will have a significant impact on profitability and productivity.

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