

Monitoring Health and Looking for Sick Cows¹

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Introduction

An important concept in dairy herd health is early diagnosis and treatment of sick cows. It may even be more important than the type of treatment administered. In lactating dairy cows, this concept cannot be overemphasized. A delay in treating a sick cow not only reduces her chances for a full recovery but results in milk production loss and may impair reproductive performance, especially if the disease occurs early post partum. Although we have made strides in postpartum cow management by implementing postpartum health monitoring strategies, quite often we fail to find a sick cow early in the disease course, which leads to a delay in treatment. Further, there are different opinions on health monitoring strategies, which parameters to use and how to interpret them. This paper reviews parameters that can be used to monitor postpartum health and discusses clinical signs to look for in sick cows.

Monitoring Postpartum Health

The postpartum period of the dairy cow determines productive and reproductive responses during lactation. Therefore, it is a pivotal time in the production cycle of the cow. During this period, dairy cows are at risk of developing calving related diseases, such as; hypocalcaemia, metritis, ketosis and displacement of the abomasum (Curtis et al, 1983). These are costly disorders with estimated economic losses ranging from 200 to 400 dollars per case per lactation (Bartlett et al, 1986). Monitoring postpartum health allows the opportunity to identify sick cows early and provide supportive therapy. Furthermore, it can help prevent diseases. For example, a cow treated early for a uterine infection is less likely to develop secondary disorders such as displaced abomasum and ketosis. Another example would be a cow diagnosed with sub-clinical ketosis: if treated a loss in milk production can be prevented.

Monitoring postpartum health involves the examination of all cows early post partum (7 to 10 days in milk) by trained farm personnel. Parameters that can be used to evaluate health status of cows include rectal temperature, attitude, milk production, uterine discharge and urine ketones. In the authors' opinion, a common problem observed on many farms when monitoring postpartum health is that too much emphasis is given to one or two of these parameters. It is important to explain to farm personnel

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involved in health monitoring that the combination of these parameters must be considered when making a decision whether or not a cow is sick and requires treatment.

Rectal Temperature

The premise for evaluating rectal temperature post partum is that an elevated temperature indicates an abnormal health status. More specifically, in postpartum dairy cows, it most likely indicates a uterine infection or metritis. Monitoring rectal temperatures will result in a wide range of values from individual cows. The normal rectal temperature range for cattle can be from 101.5 to 103° F, where a fever is diagnosed when the temperature is > 103.0 F. The variation in rectal temperature is influenced by factors such as health status, age, season of year, and time of day.

Although an individual cow's body temperature will vary, a healthy cow maintains a narrow range. A Pennsylvania study (Kristula et al, 2001) reported that cows experiencing no clinical problems at calving or during early post partum, had an average rectal temperature below 102° F for each day during the first 10 days postpartum. However, cows with metritis may present with rectal temperatures within the normal range and may not necessarily develop fever. A recent Florida study (Benzaquen et al, 2004) that evaluated daily rectal temperature and attitude to monitor postpartum health, found that over half of the cows diagnosed with metritis during the first week post partum did not have a fever.

Cows with an abnormal parturition had rectal temperatures greater than 103.1 F related to metritis for significantly more days than cows that calved normally (Kristula and Smith, 2001). Furthermore, Benzaquen et al (2004) reported that cows with an abnormal calving had a higher incidence of metritis when compared to cows with a normal calving. From these studies, it can be concluded that cows with an abnormal calving (dystocia, retained placenta or twins) should be monitored carefully early post partum.

Several studies have shown the successful use of antibiotics in cattle with elevated rectal temperatures related to metritis. Kristula and Smith (2001) reported a significant 1.0° F drop in temperature in cattle 24 hours after the initial treatment with antibiotics. Research done at Florida (Smith et al, 1998) also showed similar findings where cows identified with toxic puerperal metritis and treated with antibiotics responded with a significant decrease in temperature the following day. From this data, it is safe to conclude that dairy cows diagnosed with fevers due to metritis during the postpartum period respond positively to antimicrobial treatment.

The challenge when using monitoring programs is to decide when to treat cows. The Pennsylvania study (Kristula and Smith, 2001) cited earlier, found that abnormal cows had their highest average temperatures on Days 3 through 6 and 66 % of all cows treated were between Days 2 and 5 postpartum. Similar results were obtained by Benzaquen et al (2004). These findings suggest that the majority of cows develop fever

within one week after calving. Therefore, monitoring programs using rectal temperature should be put in place for at least 7 days after calving.

Attitude

Some people are better than others at identifying sick cows based on their general attitude or appearance. It is imperative that farm managers identified farm employees with this ability and train them properly. They should be taught to look at the eyes, ears, presence of uterine discharge and overall demeanor. Positioning and appearance of the eyes within the socket to assess level of dehydration or pain can be observed and scored. A scoring system such as 1 (minimal), 2 (mild), 3 (moderate), or 4 (severe) can be used (Smith and Risco, 2005). A cow with a score of 1 usually will have bright eyes that are positioned normal within the eye socket. A score of 2 will have dull eyes that are slightly sunken (1-2mm) within the eye socket. A score of 3 will have glazed eyes that are moderately sunken (2-4 mm) where as a score of 4 will have dry eyes that are severely sunken (>5mm) within the eye socket. Positioning of the cow's ears is also a good indicator of a cow's attitude. Sick cows usually have ears that droop down due to depression, pain, or fever. Healthy cows on the other hand appear bright, alert and are curious about their environment. Upon being approached by someone a healthy cow will often try to make contact with her nose and tongue.

In those farms that have locking stanchions, the attitude of the cow can be observed after feeding to evaluate appetite. A cow that is sick will not eat conversely; a healthy cow aggressively goes after her feed. In our clinical service we evaluate a cow's appetite according to these scoring system; 1) cows that lock and eat, 2) cows that lock appear dull and do not eat, and 3) cows that do not lock to eat and appear dull or sick. We emphasize to employees that cows that fall in categories 2 or 3 should be monitored or examined carefully.

Milk Production

Daily milk production is monitored on many farms using computerized milking machines. Milk production values are related to the health of a cow. As mentioned earlier, a sick cow does not eat and consequently her milk production drops. Dairy cows with a normal postpartum period have a steady progressive day-to-day increase in milk production. Determining the deviation value to identify these sick cows varies between farms. Some managers create a list of all cows that deviate from a value equal to or more than a preset value. In most dairies, a 10 pound drop in production is frequently used. Trained employees will use this deviation list to identify these cows and perform a thorough physical examination. Dr. Tom Overton (2001) reported on a milk production monitoring program that evaluates milk production during the first 20 days post partum. Overton reports that a goal for cows is a 10% daily milk increase during the first 14 days post partum and for heifers an 8% daily increase. In addition, a cow should be producing close to 100 pounds of milk per day by 20 days post partum and heifers 70 pounds per day. Cows and heifers that do not meet these criteria are identified and examined by trained farm personnel.

Uterine Discharge

A common disorder during post partum and commonly identified with a health monitoring program is metritis. Although, there is much debate on the diagnosis of metritis, in our clinical service cows that appear sick have a malodorous discharge from the uterus, regardless of her rectal temperature, are considered to have metritis and require treatment. Therefore, we feel that evaluation of uterine discharge is important for the correct diagnosis of metritis. Particularly, as mentioned earlier, some cows affected with metritis do not develop fever. Discharges that are red-brown contain mucus or pus that are not malodorous should be considered normal. A watery foul smelling discharge more often indicates a severe form of metritis that needs therapy as appose to a mucoid discharge that more often indicates a recovering situation. A common method used to evaluate uterine discharge is palpation of the uterus and visual inspection of the vulva for a malodorous brownish color discharge. However, this method of diagnosis is often inconsistent in the ability to produce and evaluate the discharge outside of the cow. Consequently, the use of vaginoscopy or the insertion of a gloved clean hand into the vagina and extending it to the cervix can be used to evaluate discharge.

Ketones in Milk or Urine

Ketone bodies in urine or milk can be used to diagnose ketosis in lactating dairy cattle. In our opinion evaluation of ketosis in postpartum dairy cows is not used enough and is valuable in diagnosing sick cows. The cost of subclinical ketosis per cow is estimated to be \$78 (Geishauser et al, 2001). Ketosis has been associated with an increased risk to develop metritis, (Markusfeld, 1984; Markusfeld, 1987; and Reist et al, 2003) displaced abomasums (Geishauser et al, 1997) and mastitis (Syvajarvi et al, 1986). A negative impact on milk production may also occur and it has been reported that cows that produce a positive milk ketone test produce 1.0 to 1.4 kg less milk per day for the lactation (Geishauser et al, 1997). Identification and treatment of cattle suffering from subclinical ketosis in the immediate postpartum period could reduce the negative side effects of ketosis.

Identification of post partum cows suffering from ketosis is accomplished either by analyzing urine or milk ketone levels using cowside tests. These cowside tests are based on the degree of color change occurring when ketone bodies in milk or urine contact a reagent. These tests are available as powders (commonly used in milk) and as urinalysis strips. Measuring urine ketone levels is most commonly performed because the technique to obtain a urine sample is uncomplicated, repeatable, and cost effective. A recent study (Carrier et al, 2004) evaluated the performance of 3 cowside test for detection of subclinical ketosis. The tests evaluated were: 1) a commonly used powder for detecting milk acetoacetate (KetoCheck, Great States Animal Health, St. Joseph MO), 2) a urine strip detecting ketones acetoacetate in urine (Ketostix, Bayer Corporation, Elkhart, IN), and 3) a milk test strip for ketone bodies (BHBA). The study concluded that either the Ketostix or KetoTest strips would provide acceptable results

for screening individual cows on commercial dairies to detect ketosis and the KetoCheck would have limited application.

Putting It All Together

Disorders such as metritis, displacement of the abomasum and ketosis can be evaluated by monitoring temperature, attitude, milk production and urine ketone levels early post partum. A postpartum health monitoring program assures; that all cows are examined during the time when they are most susceptible to disease, allowing the opportunity for early identification of cows that are sick. Employing a post partum health monitoring program, Benzaquen et al (2004) reported that early treatment of cows with metritis resulted in pregnancy rates comparable to cows without metritis. This suggests that identification of cows with metritis early and prompt treatment may ameliorate the effects of metritis on reproduction. The following are key points to consider in the application of a post partum health monitoring program.

- Identify key farm employees that have the interest to work with and treat sick cows. Train and work with them on a periodic basis. Have your veterinarian work with them side by side routinely. The basic premise in looking for sick cow is that the cow should be evaluated as a whole considering attitude, rectal temperature, milk production and urine evaluation for ketone bodies.
- Create Standard Operation Practices (SOP's) for detecting sick cows, physical examination and treatment procedures for individual diseases. Review these practices frequently.
- Based on farm facilities and employee abilities; you and your veterinarian should decide which program works best for your herd.
- It is important that health monitoring takes place for at least the first week post partum. Days 3 to 7 appear to be the most critical.
 - Evaluate attitude, rectal temperature and urine sample for presence of ketone bodies daily for 10 days post partum.
 - Examine cows for metritis, displaced abomasum and mastitis if they have fever (Temp > 103. F) or appear sick, regardless of temperature.
 - Cows that test positive on a urine ketone sick should be treated for ketosis.
 - Consider an evaluation of uterine discharge on days 3, 5 and 7 to make sure that cows with metritis that do not have fever are not missed.
 - Evaluation of changes in daily milk production for the first 20 days post partum is a valuable tool that can be used effectively to evaluate health.
 - Look for sick cows beyond the postpartum period. It is important to recognize that sick cow monitoring must be performed in all cows in lactation. Farm personnel involved in moving, feeding, milking or breeding cows should be cognizant of the fact that they play a major role in the identification of sick cows. Consequently, they too should be trained in how to look for sick cows. Milkers should also be well trained in how to identify cows with mastitis. It is an important component in good milking procedures.

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Notes
