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# Facts And Fallacies About The Uterus After Calving

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**U**nbelievable. That single word best describes the structure and function of what is one of the most complex organs in the body. The uterus is simply unbelievable. It accepts a substance foreign to itself, blocks the normal body defenses designed to destroy foreign “invaders”, and nourishes, protects, and sustains the developing calf while the uterus grows from a diameter of about one inch to 24 inches or more. When the time is right, the uterus accepts a signal from the calf and transforms itself into a delivery system, forcibly expelling the calf, and then begins an amazing process to prepare itself for a repeat of the whole cycle. It’s that recovery process between calving and pregnancy that is so critical to a profitable dairy enterprise, and is so misunderstood.

Following calving the uterus must expel the fetal membranes and fluid that surrounded the calf, reabsorb the small concentrated button-like areas where the calf and mother exchanged nutrients and oxygen, repair the uterine lining, and shrink to a size ready to accept the next embryo. The normal uterus will lose more than 80% of its size at calving within a two to three-week period. The process controlling this recovery is complex, and filled with a variety of control systems sending signals between the uterine glands, the ovaries, several areas in the brain, and the adrenal glands (located by the kidneys).

Other hormones associated with milk letdown have an influence on uterine muscular activity though the hormone oxytocin, which also plays a role in recovery. Plenty can go wrong, but I’m always amazed at how much goes right – frequently in spite of, rather than because, of what we caretakers do.

The rate of involution, a term that encompasses uterine shrinkage, fluid loss and tissue repair, is an indicator of the overall status of the recovery. Anything that slows involution will delay or prevent a successful subsequent pregnancy. Traditionally, we caretakers have concentrated much of our energy on dealing with uterine infections through the use of antibiotics and other treatments as our attempt to “prevent” or “cure” them. The most frequent question most dairy veterinarians are asked is “which

medicine should I use, Doc?” Many of the most popular concoctions have romantic or powerful names, pretty colors, secret ingredients, and a long list of testimonials from your colleagues singing their praises. The frustration associated with trying to get that good cow pregnant drives dairy farmers to attempt anything, even when it makes neither medical nor economic sense.

Almost all cows will become contaminated and develop a uterine infection at the time of calving. The cervix, the valve that seals the uterine interior from the outside environment, opens wide at calving to allow the calf to pass, thereby admitting whatever bugs are in the neighborhood, and the neighborhood has plenty. Multiple bacteria types, including bugs such as the coliforms, Streptococci, Actinomyces pyogenes, Fusobacterium necrophorum, and Bacteroides melaninogenicus, are found in uterine cultures during the post partum period. It is not unusual to find bacteria present in over 90% of uterine samples at 15 days after calving, close to 80% at 30 days, 50% at 45 days, and about 10% at 60 days. You might conclude that with these kinds of infection rates you should treat everything with antibiotics or antiseptics immediately. Don’t.

Why not? Before I explain why I believe across-the-board treatment is not in your cows’ best interest, answer two questions for me:

First, which medication do you want to use? You name it, someone has infused it, and I can find someone who will swear by it. Antibiotics infused into a cows uterus act a lot like antibiotics injected into muscle, but with less predictability. They move into the blood, course through body organs, and find their way into milk. Residues are always a concern, both in meat and milk, following uterine infusion. The only question is when will they be there and whether they will be at a level that can be detected. Systemic treatment, using either IM or IV regimens, also enjoys its advocates, and has similar residue concerns. Other non-antibiotic products, including uterine boluses, antiseptic infusions, and hormone treatments have been promoted and defended, but all of these treatments lack definitive research results

FALLACY:

The uterus is like an old sock, simply receiving and holding the calf until it is ready to be born.

**FACT:**

*The uterus is a dynamic, complex organ with interactions between the walls and deep tissues, the ovaries, the brain, and other organs within the body.*

FALLACY:

I can treat the signs of uterine dysfunction, such as abnormal discharge, poor involution, anestrus, etc., effectively and economically.

**FACT:**

*A dysfunctional uterus will never approach the same level of performance as one that is normal, regardless of treatment. There are treatments that can improve fertility, but prevention of the problem is the best method, and prevention of most uterine problems is possible and profitable.*

FALLACY:

Treating by uterine boluses, infusions, hormones, or systemic therapy will improve subsequent fertility.

**FACT:**

*No treatment returns an abnormal uterus to the same fertility level as compared to a normal uterus. There are studies which support one treatment over another, and other studies with contradictory results, such that there exists no definitive evidence that one product or procedure is more effective than another. Best management practices prevent rather than treat problems.*

FALLACY:

I can treat the signs of the problem, such as retained fetal membranes or a foul smelling discharge and solve the problem.

**FACT:**

*That approach is like taking aspirin to fix a headache that results from wearing a hat that is too small. The hat size needs to be changed, not better aspirin developed.*

FALLACY:

Vaginal discharge is a sign of a uterine infection.

**FACT:**

*Lochia is a normal and expected vaginal discharge during the early post partum period. Discharge that is very watery, in large quantities, and foul smelling does represent a problem.*

FALLACY:

Red medicine works best.

**FACT:**

*Color is not a factor in determining the effectiveness of a medication, and no medicine returns the abnormal animal to normal performance.*

FALLACY:

Local uterine treatment will not result in milk or tissue residues. Non-antibiotics will not result in residues.

**FACT:**

*Any medication you put in the uterus will find its way into the general circulation, and will result in tissue and milk residues.*

FALLACY:

Dry cows are the perfect group to get rid of all of the junk feed on the dairy because they don't produce any milk and don't need the good stuff anyway.

**FACT:**

*These are your most important animals on the farm, and they have real need for adequate support in order to be prepared for a successful lactation with normal fertility. Good management from the last third of the previous lactation through the first three weeks of the subsequent lactation will result in excellent milk production and reproductive performance.*

**FACT:**

*Metritis, pyometra, and forced culling from poor fertility is in large part preventable. Maternity pen sanitation, good hygiene if obstetrical procedures are needed, careful selection of which cows get treated and the treatment methods, including technique and sanitary practices, and dry cow nutritional balance will result in the post partum period being a pleasure, not a problem.*

demonstrating their benefits. In fact, there are research results published to support or detract from almost every product and treatment program ever suggested.

Why can't we develop the data to definitively answer the questions about treatment? One reason is that interpretation of results is difficult. There are three potential outcomes to any treatment; the treatment may help and improvement will follow; it may have no beneficial nor detrimental effect; or the treatment itself can be detrimental. All three can happen with a single treatment in a herd simply by chance, and it requires well designed trials comparing treatments to untreated controls to recognize the real effects of treatment. As you might imagine it is difficult to find cooperators that are willing to leave an adequate number of untreated controls in their herd for a treatment trial.

Another problem is our inability to precisely identify those animals in need of therapeutic assistance from their normal herdmates. The high percentage of positive culture results from uterine samples demonstrates the poor specificity of that test in identifying animals in need. Rectal palpation, vaginal examination, discharge evaluation, fever, appetite and other methods are commonly used to identify and initiate therapy in poorly involuting animals, but they are not perfect. The earlier you examine the animal, the more imprecise the decision to treat or leave alone can be, and you will end up treating many that didn't need it, a disadvantage to your economics and your cow's fertility. You also get fabulous recoveries (because they would have been OK without treatment anyway), and a false evaluation of the therapy.

If I told you that two dairies of the same size had different abortion rates last year, and although Dairy A's rate was 2% higher than Dairy B's, I concluded that Dairy A was in better shape than Dairy B, would you disagree? Would you change your mind if I added that Dairy A had 55% of the herd pregnant, and Dairy B only had 30%? I'm sure you will agree that pregnancy is an essential qualification for risk of abortion. The same problem exists in treatment

trials; if we don't know which really need it, and mix in large numbers of those that do not, we make interpretation of results very difficult. I've always felt that if "recovery rates" for treatment of infections, cystic ovaries, etc., we high, say over 50% at a two week recheck, then I probably treated a bunch of animals that didn't need it.

Second question: how are you going to evaluate the results? Part of the confusion in evaluating various treatments result from our inability to routinely select the correct goal of therapy. What yardstick are we going to use to measure success?

When I was working as a milker we used to call the vet to come clean cows with retained fetal membranes. Our yardstick of success was to eliminate the tail switch from stinking so that whenever she hit us in the face she would not transfer that wonderful odor to our nose area. By this measure manual removal of a retained placenta was a smashing success, and was a common practice, until some smart person looked at its influence on days open and found treated animals were significantly and adversely affected. We were simply using the wrong yardstick to evaluate the therapy.

Need another example? Twenty years ago or so veterinarians were regularly called to bring anestrus cows into heat, and occasionally they used an injection of a hormone available at that time that made them express heat signs. It worked – if a cow acting like she was in heat was your goal. If you really wanted a pregnancy, however, the use of that product was counterproductive.

I recommend against treating every cow. In my experience the routine use of uterine boluses creates problems where none existed, and simple discontinuing that practice directly improves herd fertility. Similarly, routine infusions result in increased day open. In my hands it appears that a single uterine infusion in heifers early in the postpartum period will increase days open by eight without any improvement of conception rates or numbers getting pregnant. There is ample evidence to be concerned that most treatments administered to normal cows will result in increased days open, and that

our ability to identify normal is imprecise. Additionally, there is no clear scientific evidence that any given treatment is beneficial to the majority of animals being treated. Animals that are off feed, feverish, with very thin watery and foul smelling discharge need and will benefit from treatment! There exist other uterine problems that can be treated with improved performance as the outcome. My point is simply that your time is better spent preventing the problems in the first place, with proven effectiveness, rather than spending your time, money, and effort using treatments which do not always result in improvement, and which may be detrimental to the animals subsequent performance.

There has been an explosion in our understanding about how to maintain a healthy uterus under commercial dairy conditions. Prevention management practices allows us to reduce the numbers of animals needing treatments to less than 25% in most commercial herds, and much lower in exceptionally managed herds. Cow fertility is significantly improved in those that never needed treatment versus those that do. No therapy returns a cow to the level of normal performance. Prove this to yourself by comparing days open, services per conception, and culling rates for normal animals that deliver live calves unassisted, do not retain their placenta, receive no treatment, and are pregnant within two services (my definition of normal) against their treated herdmates.

We now know what many have long suspected: a relationship exists between poor fertility and a number of other cow problems. The risk of poor fertility is increased if the animal has any one or combinations of: milk fever, prolonged but unassisted calving, assisted calving, retained fetal membranes, prolapsed uterus, mastitis, ketosis, fat cow syndrome, displaced abomasum, unsanitary calving conditions, or unnecessary post partum treatment. The key management points to prevent these conditions revolve around energy and protein balance; control of rapid weight gain or loss; proper body condition at calving and into the early lactation period; calcium and phosphorus balance; anion/cation balance of the dry cow ration; trace mineral and vit-

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amin balance; calf size (sire selection); sanitation at calving; and post partum treatment methods.

Heifers must be of adequate frame size, and proper body condition, to successfully deliver a calf while supporting their needs for growth and milk production. High rates of anestrus heifers in the first 70 days of lactation, which were at their proper frame and body condition at the time of calving, represent a ration imbalance or unsuccessful competition with older cows at the feed bunk, or both.

The preparation for the following lactation in cows begins in the last third of the previous pregnancy. This is the time to carefully monitor their body condition and adjust their rations to achieve their ideal condition. An extra bonus to good management is that this period also represents the most economical time to put weight on animals that are underconditioned, and to take weight off of those that are overconditioned.

We now know that our old recommendations to have cows at body condition scores of 4+ during the dry period represented the use of the wrong yardstick. It may have helped them from getting too thin during their first 1/3 of the following lactation, but also lowered both their production and fertility. Cows should be dried at body condition scores of 3-3.5, and calved at 3.5 for maximum production and fertility. Rapid changes in weight, in either direction, are likely to result in fat cow syndrome, which can result in delayed involution, increased uterine infection rates, and poorer recovery.

*The dry period is a terrible time to get rid of that junk feed you've got laying around. These are your most important cows on the farm, and this is the most important period in the whole lactation. The ration needs to be carefully balanced for energy, fiber, and quality protein to provide the cow with the ability to deliver a healthy calf, recover from pregnancy, and reach her maximum potential pro-*

*duction. Adequate trace minerals and vitamins are essential. Prevention of heat stress, corral maintenance to promote feed intake, sanitary bedding, adequate water, and all the other well known husbandry requirements that are frequently missing from dry cow pens are money makers if you use the right yardstick as your goal.*

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### notes

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