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Rumen Fistula Surgery for the Private Practitioner

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- This article describes one method your veterinarian might use to fistulate a dairy cow.
- Fistulated cows can be used as donors for a procedure called transfaunation, which is the process of transferring rumen microbes from one cow to another.
- Transfaunation may be helpful in treating cows that are severely off-feed, particularly in cases of pronounced acidosis.

Rumen fistula surgery for the private practitioner is becoming more common as the need for transfaunation becomes more evident. Transfaunation is the process of transferring rumen microbes from one cow to another. Generally, transfaunation is used to re-inoculate the rumen of a sick cow with a healthy microbial population. With today's production practices utilizing low forage and high concentrate feeding, off-feed cows suffering from rumen acidosis has become a common herd occurrence. One on-farm tool that allows producers the option of transfaunation is a fistulated cow(s). Fistulated cows may also be used to refaunate cows that have been off-feed due to mastitis or other illness. The success of a donor cow program lies in proper transfaunation technique and the appropriate selection of donors.

Utilization of donor cows:

Quantity of Fluid Collection:

Generally an average rumen contains about 70 liters of fluid. Collection should be somewhere between 0.5 and 3.0% of this fluid level. Low collection levels will preclude any secondary problems to the donor cow. Therefore, the transfaunation fluid volume would be between 350 ml and 2.0 liters. It is important that the collected fluid be stored out of light, anaerobically and at the cow's body temperature. A prewarmed, ½ gallon thermos works well and can be vented if more than 15 minutes will elapse between collection and transfaunation

Time between collection and transfaunation:

Timing is very critical to the success of transfaunation. Generally the fluid should be in the recipient cow within thirty minutes post collection. Two hours appears to be the limit to success if the collection is maintained in a strict anaerobic environment. At about the two-hour time limit, the starch-digesting organisms have increased dramatically and the fiber-digesting microbes have decreased substantially.

Time of Day to Collect:

The number of hours post feeding of the donor cow usually determines collection time. Collection timing will be very important in emphasizing the type and number of organisms present in the collection fluid. The inappetent recipient cow is probably in rumen acidosis and therefore should be transfaunated from a donor cow two

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hours post prandial.

Monitoring Fluid quality:

The monitoring of fluid pH is as important a selection criterion as assessing microbe numbers. The ideal range is 5.8 to 6.2 for maximal microflora count. If the pH is below this range, the microbial activity will also be diminished. With a more highly acidic environment starch-fermenting organisms will dominate over cellulytic microbes. Protozoa and fungi will also vary at lower pH's.

Transfaunation procedure:

When transfaunating, try not to disturb the donor cows rumen mat or rumen mucosa. Generally it is best to insert a short stomach tube and pump out the necessary fluid. Recipient cows generally require 1000 ml of fluid twice daily for 2-4 days. Most transfaunation failures occur with inadequate donor fluid levels, not maintaining an anaerobic environment, concomitant use of antibiotics and inadequate length of transfaunation fluid treatment.

Fistula Surgery Technique:

Surgical candidate selection should emphasize full growth and maturity (2.5-3.0 years of age), excellent feet and legs, non-obese and free of health problems (leucosis, BVD and Johnes negative). Immature cows are not ideal candidates. When final growth does occur, the cannula site expands in size causing leaking and drainage around the fistula site.

It is best to hold the patient off feed for 12 hours. This greatly reduces the chance for post surgical rumen tympany. Some practitioners prefer that cows are also kept from water for 12 hours. However, at FARME Institute we allow free access to water prior to surgery and have not had a problem with 30+ surgeries.

Standing surgical restraint in a chute or headlock is far superior to the lateral surgical approach. The lateral surgical approach increases risk for regurgitation, tympany and surgical site leakage into the abdomen. It is imperative that while the patient is in the chute a minimal mechanical pressure be applied. Mechanical and surgical rumen displacement can lead to an acute post surgical LDA formation.

Surgical site selection should be made in the left paralumbar fossa. Anesthesia should be performed using lidocaine with a proximal lumbar paravertebral nerve block. Anesthesia can alternatively be applied using the inverted "L" or distal lumbar paravertebral block. Sterile surgical procedure and preparation is indicated. It should be remembered that rumen content leakage could stimulate peritonitis in the post surgical patient. Mark the proposed surgical site with a waterproof Sharpie â pen tracing the cannula circumference onto the skin. The dorsal border of the surgical site should be 3 inches (7.5 cm) or one hands breadth ventral to the transverse processes of L-2, 3. The cranial border should be 4 inches (10 cm) or slightly beyond one hands breadth caudal to the 13th rib. The final position of the rumen fistula should be approximately midway between the tuber coxae and the last rib. The initial incision should be **through the skin only**. When making the incision, it should actually be one half inch (1.25 cm) narrower than the actual circumference of the cannula. This will allow for adequate surgical seal formation. The three underlying muscle layers should be **spread rather than incised**. The key to success and holding ability of the surgery is spreading rather than incising these muscle layers. This will facilitate an elastic contraction around the fistula. The peritoneum is easily visualized and incised with scissors. Do not incise the rumen at this time.

Using two to three Backhaus towel clamps, spaced about 5 cm apart, grasp the dorsal rumen in a position where it would normally contact

the peritoneal surface.

Here it is paramount that **the normal position of the rumen within the abdomen be maintained**. Through traction, the rumen surgical site is exteriorized by 2-3 inches (5-7.5 cm). Using rather heavy synthetic suture material (my choice is #3 PDS) place four horizontal mattress sutures at "quarter hour" positions (12, 3, 6 and 9 o'clock) as stay sutures. It is important when suturing **that the muscles are not incorporated in to the wound**. Skin, peritoneum and rumen wall are all that are included. The suture tension should be just adequate to hold the field in apposition. Closure of the wound site should then be either with a continuous suture pattern or additional horizontal suture placement. All tissue should be apposed. The suture field should produce a succinct seal between the peritoneum and the skin and should be slightly tight for the cannula placement. Incise the rumen wall one half centimeter from the wound margin/apposing skin. Special care should be maintained to minimize any damage that may occur to the rumen wall. At FARME Institute, we do another suture line that seals the cut edge of the rumen to the skin surrounding the fistula opening. We find that this improves the final seal and provides an added line of defense against peritonitis.

The cannula (Bar Diamond â, Parma, ID 83660. (208) 722-6761 or Ankom, Fairport, NY 14450. (716) 425-3940) should be sanitized and warmed in a bucket of fairly hot water to increase the pliability for insertion. Lubricating jelly can facilitate the procedure. Insert the cannula folded into the rumen fistula opening carefully not tearing the outer wound surface. This can be a fairly difficult procedure but lubrication and warming the cannula is usually adequate for insertion. It can be helpful to start out with a 3" cannula rather than the 4" model that will eventually be used. After 3 to 4 weeks of healing, the 3" cannula will be noticeably loose in the fistula. It can then be replaced with a 4" cannula. Another problem that may be encountered is a cannula plug that is not deformable. Immediately after surgery, the fistula is often oval, rather than round. This problem will correct with time; however, a solid, round cannula plug like Ankom's may not work for a couple of weeks! It can be helpful to use a hollow (Bar Diamond-type) plug immediately after surgery and then switch over if desired (many users prefer the solid plug with "finger holes" marketed by Ankom for its ease of removal).

Generally, post surgical antibiotics are at the discretion of the surgeon. Generally I prescribe a course of penicillin or amoxicillin for 5 days. This reduces the chance for a post surgical infection.. Post surgical swelling is a fairly common sequela. Minimize trauma to the cannula or wound site for 7-10 days post surgery. Isolated confinement may be indicated. During fly season, daily washing of the incision area with soapy water will prevent problems.

Transfaunation is an important tool in the medical management of acidotic or otherwise inappetent dairy cows. Donor animals help readily provide the necessary amounts, quality and quantity of fluid.

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