

July 27, 2022

Guidelines for Long-Term Care and Maintenance of Animals with Permanent Rumen Fistulas at Penn State

Purpose of Guidelines: To ensure routine and consistent long-term maintenance and care of ruminant animals surgically prepared with a permanent rumen fistula and to meet the requirements of the Institute Animal Care and Use Committee, and related state and federal laws and regulations.

Responsibility for Maintenance and Care: Surgical preparation of university-owned animals can only be performed after IACUC approval of a protocol justifying the need for this procedure and the use of the animals.

1. The dairy will be responsible for all cannulated cows regardless if on research or not. Nadine Houck or Travis Edwards will be responsible for all research cannulated cows.
2. Cannulae will be removed and cleaned thoroughly on a monthly basis for all animals. The condition of the cannula will be recorded.
3. All researchers using cannulated animals for their trial will purchase new cannula as needed that will be stored at the dairy for future replacement.

Maintenance and Care:

Animals with rumen fistulas must be monitored (observed) frequently for:

Appetite
Behavior
Presence and fitting of cannulae

For cows participating in research or required to be milked, daily observations will be necessary. Nonlactating cows on pasture should be monitored on a weekly basis.

Cannula and fistula (hole to rumen) must be closely examined and evaluated once weekly, when the animal is actively being used or during fly season. When there is no active use of the animal biweekly assessments will be sufficient. During this examination the cannula and skin under its outer flange must be thoroughly examined. The following observations should be made: 1) Excessive leakage of rumen fluid from between the cannula and the fistula? Excessive leakage might indicate that the current cannula needs to be replaced with one of a larger size. 2) Foul (necrotic) smell from around cannula. This would suggest that either the cannula might be too tight or that a localized infection is occurring. Check under the

flange of the cannula and observe the tissue at the rumen-skin junction for inflammation and/or infection.

If a cannula accidentally comes out of an animal, it is important that it be reinserted immediately. This should be followed by a physical assessment (hydration, appetite, consistency and quantity of manure, and production) of the animal. An animal that loses its cannula for a prolonged period of time has a tendency to lose excessive fluids and electrolytes which could compromise its health. A veterinarian should be consulted if it is suspected that an animal has lost an excessive quantity of fluid. (The herd manager/tech service employee and the current supervisor on duty must be informed of such occurrences and the date of incident recorded regardless if the animal is on a research project or not.) It is typical for the majority of fistulas to leak, some more excessively than others. All debris which becomes caked onto the skin surface surrounding the cannula (ingesta, bedding, etc.) must be removed at least weekly by whatever method proves to be most satisfactory for the investigator and least stressful for the animal. This can most often be accomplished with combs, brushes, warm/soapy water, and perhaps, hair clippers. It is usually beneficial to keep the hair ventral to the cannula clipped so as to prevent the accumulation of debris and to ease the routine cleaning process.

Rumen cannulae are typically very flexible when they are new. After a period of time (months) rumen fluid might cause a cannula to lose this flexibility, making it difficult to remove from the fistula to clean. A cannula must be replaced if it loses flexibility.

This will allow the removal of any ingesta which might have accumulated under the inner flange and to look into the rumen in order to visually examine the surface of the rumen which lies under the inner flange.

Once the cannula has been removed from the rumen it should be rinsed and wiped/scrubbed clean with warm tap water. Mild detergents can be used, but must be removed from the cannula surface prior to its reinsertion.

Maintaining Records: Although production and health records are typically maintained for each member of a PSU flock/herd, it will be necessary to create and maintain an additional permanent record for each animal after it is fistulated. This record will allow the uniform transfer of historical information about each animal from investigator to investigator. The record should contain dates and information pertaining to significant events, starting with the date the fistula is surgically created. Other important entries would be: abnormal observations (excessive leakage, infection, treatment, etc), replacement of the cannula, changes of Principle Investigators and protocols, and anything believed to be significant. Maintenance of these records will be the responsibility of the herd managers /tech service employee. Records will be maintained for the livelihood of each animal while it is owned by Penn State. These records must be kept at the facility the animal is housed and available for review periodically by the Attending Veterinarian, the facility manager and/or members of the IACUC.

Disposal of Surgically Prepared Animals: Unless permission is specifically granted otherwise, any animal surgically prepared with a permanent fistula will be disposed of by one of two ways: 1) euthanized by a veterinarian and submitted directly to the State Diagnostic Laboratory (University Park) for necropsy; or 2) send directly to a Federally approved slaughter facility.

Who to Contact for Questions and Guidance: In the event of an emergency or questions concerning the care/treatment of a particular fistulated animal contact the manager for the facility the animal is housed.

Dairy Production Research Center: Nadine Houck – 814-863-3809

In the event of a life-threatening emergency, and preferably after the facility manager has been contacted, the Clinical Veterinarian (Straley Large Animal Vet Associates: 814-280-3876) or the Attending Veterinarian (Dr. Jake Werner: 865-1495) should be contacted. Should problems arise regarding the fistula/cannula, the veterinarian who performed the initial surgery should be consulted.

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Standard Operating Procedure for Maintaining a Rumen Fistulated Animal

1. Assess the severity of leakage (if any) of rumen fluid from the fistula.
2. Assess the condition of the cannula.
3. Assess the status of the animal.
 - Appetite Behavior
 - Body Condition
 - Production parameters (growth and/or milk yield, if lactating)
 - Current medical problems (mastitis, lameness, G.I., reproductive, etc)
4. Clean and groom animal, particularly the area ventral to the cannula. Debris (rumen fluid and bedding) can be removed from the hair and surface of the skin using warm tap water, soft scrub brushes, and mild detergents. Hands should be protected with rubber gloves during this procedure. This procedure should be accomplished as needed.
5. Twelve times per year the entire cannula must be removed from the fistula in order to be cleaned. This technique can only be done when the animal is restrained and standing, and can be demonstrated by either the veterinarian performing the initial surgery, the attending veterinarian, or the P.I.. Tranquilizers are not necessary for this procedure. For cleaning, the cannula should be submerged into warm tap water. All debris should be removed from the surface of the cannula; mild detergents can be used, but must be completely rinsed-off prior to reinsertion into the fistula. While the cannula

is removed, the skin and rumen surface covered by the cannula should be examined. The entire procedure should take no longer than 10 minutes.

6. Record observations and animal care procedures in the animal's record. Provide date and name of individual making the observations and/or performing any procedures. These records must be kept at the facility the animal is housed and available for review periodically by the Attending Veterinarian, the facility manager and/or members of the IACUC. This log is maintained at the parlor office. Please do not remove logbook from office.