



## AgMOOC Course on Fluid Therapy and Management of Clinical Syndromes in Cattle and Small Ruminants

Unit : Anemia and Blood Transfusion in Ruminants

Lesson : 4

# Case selection & Blood Transfusion in Cattle

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## When to do?

- Sometimes it is necessary for the practitioner to transfuse the ruminants with whole blood or plasma.
- Techniques are often difficult to perform in practice, & are time-consuming, expensive, and stressful to the animal.
- Acute loss of 20% to 25% of the blood volume will result in marked clinical signs of anemia, including tachycardia and maniacal behavior.

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## PCV is the Guiding Force..

- PCV is a useful tool with which to monitor acute blood loss after intravascular equilibration with other fluid compartments has occurred.
- An acutely developing PCV of 15% or less may require transfusion.
- Chronic anemia with PCV of 7% to 12% can be tolerated without transfusion, if the animal is not stressed and no further decline in erythrocyte mass occurs.



# Donation & Transfusion Basics



# Donation & Transfusion Basics



## Donation & Transfusion Basics – Cont'd:

- 75 percent of transfused bovine erythrocytes are destroyed within 48 hours of transfusion.
- A transfusion rate of 10 to 20 mL/kg recipient weight is necessary to result in any appreciable increase in PCV.
- A non-pregnant donor can contribute 10 to 15 mL of blood/kg body weight at 2- to 4-week intervals.

# Selecting Anticoagulants

- Sodium citrate is an effective anticoagulant, but acid citrate dextrose should be used if blood is to be stored for more than a few hours.
- Blood should not be stored more than 2 weeks prior to administration.
- Heparin is an unsuitable anticoagulant because the quantity of heparin required for clot-free blood collection will lead to coagulation defects in the recipient.



# Cross Matching / Reaction Checks

- Blood cross-matching is only rarely performed in the ruminant.
- In field situations, it is advisable to inject 200 mL of donor blood into the adult recipient and wait 10 minutes.
- If no reaction occurs, then the rest of the blood can probably be safely administered as long as volume overload problems do not develop.
- Adverse reactions are most commonly seen in very young animals or pregnant cattle.





# Doing a Blood Transfusion in Bovines

# The needy cases

- Big increases in Tick borne Diseases (TBD), especially, theileriosis cases results in a number of cases with severe anemic crisis.
- Field Veterinarians are increasingly attempting to give blood transfusions.
- Many of these are reported as being successful and are worth doing it from a welfare and treatment aspect.
- These are also very satisfying for veterinarians and farmer clients

Transfusions are great Public Relation Building Efforts for Vets; but helping the farmer do everything right, to minimize impact, is the most important thing.

# Who are the Recipient Cows

- Remember we have nothing to lose. If a cow needs a transfusion, it needs a transfusion. It may die without it, so it's worth a try, even if we don't always get a positive outcome.
- PCV <10 needs a transfusion.
- PCV between 10 and 15 will benefit from a transfusion
- Cows don't actually look yellow until their PCV <12.
- Be discerning and run PCVs on anything slightly pale or otherwise sick in an affected herd.
- Please remember that the astute farmer may actually be better at finding pale animals than we find.



# Prepare for Transfusion Reactions

- Transfusion reactions may occur.
- It is imperative that if we are doing transfusions, we must have both Antihistamine and Adrenaline (5-10ml) on hand, for usage in case of these emergencies.
- Do aware of these reactions.



# Blood Transfusion Reactions in Cattle

# Transfusion reactions

- Bovine blood 11 to 13 major types
- Bovine red cells don't agglutinate easily
- Most important factors: haemolysins
- Preformed isohaemolysins not present or in a very low quantity
- Repeated transfusions within seven days more risk for reaction

# Signs of Transfusion reactions:

Usually reactions are rare and mild:

- Signs of blood or plasma transfusion reactions includes:
  - Hiccoughing
  - Tachycardia
  - Tachypnea
  - Sweating
  - Muscle tremors
  - Pruritus
- Salivation,
- Cough,
- Dyspnea, fever,
- Lacrimation, hematuria,
- Hemoglobinuria,
- Collapse, apnea, and
- Opisthotonos.

# Administration Guidelines

- Administration rates have been suggested starting from 10 mL/kg/hr
- Faster rates may be necessary in peracute hemorrhage.
- Plasma should be administered when failure of absorption of passive maternal antibody has occurred or when protein-losing enteropathy or nephropathy results in a total protein of less than 3 g/dL or less than 1.5 g albumin/dL.

# Managing Transfusion Reactions

- Intravenous epinephrine HCl 1:1000 can be administered (0.2 to 0.5 mL) intravenously or (4 to 5 mL) intramuscularly (preferably) if clinical signs are severe.
- Pretreatment with antipyretics and slowing the administration rate may decrease the febrile response.
- Blood or plasma administered too rapidly will also result in signs of cardiovascular overload, acute heart failure, and pulmonary hypertension and edema.
- Furosemide and slower administration of blood or plasma should alleviate this problem.

# Plasma Transfusions

- Plasma can be stored at household freezer temperatures (-15 to -20 degrees C) for a year;
- Coagulation factors will be destroyed after 2 to 4 months when stored in this manner.
- To maintain viability of coagulation factors, plasma must be stored at -80 degrees C for less than 12 months.

# Plasma Administration

- When administering plasma, a blood donor set with a built-in filter should always be used.
- When bovine plasma is thawed, precipitants form in the plasma and infusion of these microaggregates may result in fatal reactions in the recipient.





*Thank  
you*