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

Unit : Anemia and Blood Transfusion in Ruminants
Lesson : 2

The Practice of Transfusion Medicine in Bovines

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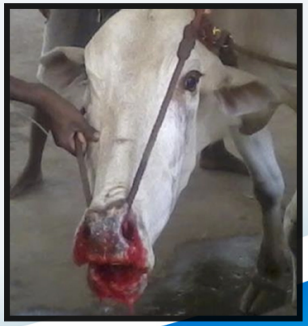
Why we need Transfusions

- Need for blood transfusions is acute, as in acute hemolysis or hemorrhage;
- Transfusions are also appropriate in treatment of acute or chronic anemias.
- Animals with hemostatic disorders often require repeated transfusions of whole blood, red cells, plasma, or platelets.
- Blood transfusions must be given with care, as they have the potential to further compromise the recipient.

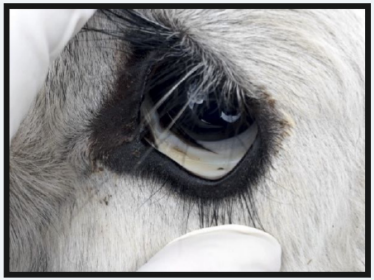
Indications – Acute Hemorrhages

- **Acute haemorrhage**
  - *Rupture of vessels after (severe) extraction during dystocia care*
  - *Complication after caesarian section*
  - *Uterus prolapse*
  - *Umbilical vessel damage by a newborn calf*
  - *Trauma, Accidents*
  - *Surgiacal Procedures*
- **Abomasal ulceration**
  - *Anaemia and Melena*
- **Tick born protozoan parasites**
- **Destruction of erythrocytes**



Indications – Chronic Hemorrhages

- Parasites:
  - Haemonchus spp
  - Strongyles spp

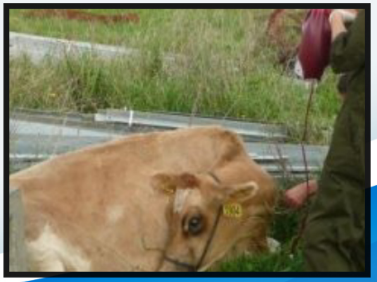


Hemolytic Anemias

- Blood Parasites:
  - *Theileiasis, Babesiosis, Anaplasmosis, Leptopsirosis etc*
  - *Phosphorous deficiency hemoglobinuria*
  - *Bacillary hemoglobinuria*

Whole Blood

- Whole blood frequently is not the ideal product to be administered.
- If the need is to replace the oxygen-carrying capability of the blood, then packed RBCs are more appropriate;
- If replacement of circulatory volume is needed, crystalloid or colloid solutions may be used, with packed RBCs added as needed.



RBC Transfusion

- The decision to transfuse RBCs is determined by clinical signs, not by any pre-selected PCV.
- Animals with acute anemia show signs of weakness, tachycardia, and tachypnea at a higher PCV than animals with chronic anemia.
- The amount of RBCs required to relieve clinical signs will generally increase the PCV above 20%.

Platelets and Plasma

- Platelet numbers rise rapidly after hemorrhage, so replacement is rarely needed.
- Plasma proteins equilibrate from the interstitial space, so plasma is not needed except in massive hemorrhage (>1 blood volume in 24 hr).
- Animals that require coagulation factors benefit most from administration of fresh-frozen plasma or cryoprecipitate if the need is specifically for factor VIII, von Willebrand factor, or Fibrinogen.

Platelet-rich plasma / Platelet concentrates

- Platelet-rich plasma or platelet concentrates may be of value in thrombocytopenia, although immune-mediated thrombocytopenia usually does not respond to administration of platelets because they are removed rapidly by the spleen.

Blood Volume

- Domestic animals have blood volumes of 7%–9% of their body weight
- By determining the recipient's blood volume and knowing the animal's PCV, the required replacement RBC volume can be calculated
- No more than 20% of a donor animal's blood should be collected at one time.

Clinical Facts

- Normal blood volume: 8 % of BW
- Normal adult bovine PCV: 24 – 43 %
- Haemorrhagic shock when 30 – 40 % of the total blood volume is lost rapidly
- A cow with a PCV of 10 % will have lost two-thirds of its circulating red cells

Clinical Facts

- One litre blood will raise up the PCV with +/- 0,75 %
- The clinical difference between a cow with a PVC of 8 % and a cow with 14 % is remarkable
- Turn over of red cells is not very long (2 to 3 days)
- Repeated transfusions can cause reactions, red cell survival only a few hours

Thank you