BOVINE BLOOD TRANSFUSION

Blood transfusions in cattle are performed as an emergency life-saving procedure

- Normal blood volume is 8 percent of body weight (a 60-g th 48-l o blood)
- Normal adult vine PCV is 24 to 43 percent - A healthy adult cow can donate 10 to 15 ml of blood/kg body weight without any danger
- Hemorrhagic shock occurs when 30 to 40 percent of the total blood volume is lost rapidly.
- Animal with a PCV of 10 percent will have lost approximately two-thirds of its circulating red cells
- The administration of blood to an anaemic adult cow will raise its PVC by a rate of 0-75 percent per litre of blood given
- The clinical difference between a cow with a PCV of 8 per cent and a cow with a PCV of 14 per cent is often remarkable and very satisfying
- The life span of transfused red cells may not be very long (possibly as short as two to three days), but the excellent recovery rates indicate that red cell production by the recipient animal usually compensates

Selection of a donor:

In order of importance, the donor cow should be:

- Quiet to handle;
- Not suffering from any disease (check urine colour);
- Not heavily pregnant;
- A large mature animal that is not too fat, so that it is easier to find the jugular vein;
- The same breed as the recipient, as this may reduce the risk of a transfusion reaction;
- Non-lactating, since the administration of xylazine will necessitate a milk withholding period.
Blood collection

- Restraint is achieved using a halter or neck chain and nose grips. Sedate the animal with xylazine.
- Surgically prepare the collection site in the mid jugular area.
- Make a 1.5 cm skin incision over the jugular vein using a number 11 scalpel blade.
- Inject another 1 ml of local anaesthetic through the skin incision and into the subcutaneous tissue around the jugular.
- This prevents pain caused by insertion of the large bore needle.

Equipment required

1. Large bore collection needle with internal diameter of 4 to 5
2. Nosegrip (eg, Kruuse blood letting needle) U Suture
3. Large bore giving set with in-line 4 metric filter of 170 to 200 um pore size.
4. A (or similar) double inlet spike is useful to allow two blood containers to be attached at once
5. Two flutter valves and short lengths of tubing to join the collection container stothegiving set inlet spikes
6. Two 5 litre collapsible plastic containers for blood collecton
7. Large plastic funnel *
8. 12 gauge 8cm intravenous catheter
9. Number 11 scalpel blade
10. Razor blade for shavig-hair
11. Surgical scrubandsrit
12. 2 ml syringes
13. Local anaesthetic solution
plastic containers attached
with double inlet spike
collection of blood using wide bore needle:

- Raise the vein by digital pressure.
- Applying a tourniquet to the lower neck can sometimes be helpful in raising the vein.
- Insert a large bore needle through the skin incision and into the jugular vein. (In cases where a large bore needle is not available, a larger skin incision can be made, the jugular identified and a stab incision made into it; however, this method makes blood collection more difficult and there is a higher chance of contamination.
- The blood is collected using a funnel inserted into the top of the collection vessel containing an anticoagulant (see box below). To reduce the chance of airborne contamination, a closed system can be used.
- With the help of an assistant, the collected blood is gently agitated to mix the anticoagulant.
- After collection of 5 to 8 litres (which takes about 10 minutes), release the pressure on the jugular vein and remove the collection needle.
- Close the skin incision with a couple of polyamide sutures. The jugular vein will heal and the cow will not bleed to death.

**Administration of blood**

1. Restraint of the recipient animal is achieved using the same method as that for the donor
2. Attach the collection container(s) to the giving set.
3. Suspend the containers approximately 1 m above the level of the recipient's head.
4. Run the blood through the tubing to expel any air.
5. Surgically prepare the catheter insertion site in the mid-jugular area.
6. Subcutaneously inject 1 ml of local anaesthetic over the jugular.
7. Make a 05 cm skin incision using a number 11 scalpel.
8. Insert a 12 gauge 8 cm catheter into the jugular vein and suture in place.
9. Attach the end of the giving set to the catheter and allow the blood to flow.
10. The administration of 5 to 8 litres will take 30 to 45 minutes and cardiovascular overload does not seem to be a problem.
11. The recipient should be monitored closely for signs of a transfusion reaction (see later).
12. When the transfusion is finished, remove the catheter from the jugular vein. It is not necessary to suture the skin wound.

**Trasfusion Reactions**

Bovine blood has at least 13 major types. Bovine red blood cells do not agglutinate easily and the important factors in transfusion reactions are haemolysins. Fortunately, pre-formed iso-haemolysins are normally lacking or present in very low quantities in serum. Consequently, initial unmatched blood transfusions can be given without serious threat of a fatal reaction. Repeat transfusions within a seven-day period also carry a low risk of precipitating a severe reaction.

**Signs of transfusion reaction include:**

- Increase in respiratory rate;
- Sweating;
- Tachycardia;
- Violent movements (which should not be mistaken for resentment of restraint);
- Severe respiratory distress

Transfusion reactions can be treated using one of the following regimens:

* 5 ml of a 1:1000 (1 mg/ml) solution of adrenaline given intramuscularly. This produces an effect in three to four minutes;

* 0.2 to 0.5 ml of the same solution given intravenously. This route of administration carries a greater risk of causing cardiac arrhythmia.