**ADMINISTRATION ROUTES:**

**Oral Fluid Administration:**Oral fluids should only be used in animals that are 1-5% dehydrated. If the animal is more dehydrated than this, oral fluids alone do not meet the animal’s needs. The most common problems with oral fluid administration are that the method and frequency of administration is not ideal and the quantity administered is often insufficient. To overcome these problems, the following suggestions are a must:

1. Calculate the animal’s fluid requirements using the previous example. Give no more than 250 mLs at one time to small newborns or 3-5 liters to adults.
2. If electrolytes are going to be fed, reconstitute them exactly according to the manufacturer’s instructions.
3. The best way for a newborn to obtain oral fluids is by suckling a nipple bottle. This allows the fluid to enter the abomasum through the esophageal groove. If the newborn is too weak to suckle, fluids can be administered with an esophageal or tube feeder. This method, however, causes the fluid to enter the rumen directly and not the abomasum.
4. Do not be reluctant to administer milk or milk replacers in addition to electrolytes to newborns. Electrolytes do not contain adequate nutrition for the lamb/kid; therefore, milk is necessary. It is true that some milk replacers can increase the amount of diarrhea that is produced, yet this is a necessary trade off for the extra nutrition the animal requires. All electrolytes and milk replacers should be fed at least 30 minutes apart and never mix the two fluids. Milk digestion is slowed when combined with oral electrolytes.
5. Dehydrated adult animals may require oral administration of fluid through a stomach tube.
6. The frequency of fluid administration can be variable and depends on the severity of the fluid loss and management issues. In general, animals that are only slightly dehydrated may require only two oral doses, while animals that are around 5% dehydrated may require oral fluid every 2 hours.

**Subcutaneous (SQ) Fluid Administration:**This method of fluid administration should be used in those animals that are 6-8% dehydrated. If SQ fluids are given, remember the following:

1. If the animal is greater than 8% dehydrated, IV fluids should be given.
2. Warm the fluids to body temperature before administration.
3. Use only sterile isotonic fluids (0.9% saline solution).
4. The loose skin areas of the neck, shoulder, and behind the elbow are good areas to administer SQ fluid. The injection area should be cleaned and sterilized before inserting the needle.
5. The fluid can be given as one large bolus or can be given over a period of time. Do not give over 60 mLs in one location and over 300 mLs total to one newborn at one time. Adult animals can tolerate larger volumes. It usually takes about 4-6 hours for the fluid to completely absorb.
6. Oral and SQ fluids can be given at the same time and are often a great method of restoring proper hydration.

**Intravenous (****IV) Fluid Administration:**IV fluid administration requires that a sterile [catheter](http://www.infovets.com/books/smrm/K/VetG.htm#C) be placed in the animal. This requires professional help and additional training. Once the catheter is in place, the following should be considered:

1. Only administer sterile fluids (Lactated Ringers, 0.9% saline solution, etc.).
2. Calculate the animal’s fluid needs by utilizing the table and example at the front of this discussion.
3. Many animals with diarrhea are acidotic (meaning that they have a low blood pH). Because of this, bicarbonate may need to be added to the first 1-3 liters of fluid. If 0.9% sterile saline solution or sodium chloride is used, approximately 13 grams of sodium bicarbonate or 150-175 mLs of 8.4% sodium bicarbonate solution should be added to each liter of fluid to make a 1.3% solution. To make a 5% sodium bicarbonate solution for [acidosis](http://www.infovets.com/books/smrm/K/VetG.htm#A), 50 grams of sodium bicarbonate should be added to each liter of fluid.
4. Supplemental glucose is often necessary. Adding 30 mLs of 50% dextrose solution to 1 liter of IV fluids makes a 1.5% dextrose solution; adding 100 mLs of 50% dextrose to 1 liter makes approximately a 5% dextrose solution.
5. In general, once the amount of fluid the animal requires is calculated, two-thirds of that amount can be given in the first hour. For example, if the animal requires 750 mLs of fluid, 500 mLs can be given in the first hour. After the first hour, the rest of the fluids (250 mLs) can be given evenly over a 2-3 hour period.
6. After the initial calculated fluid dose is administered, additional fluids can be given at a rate of 5 mLs for every 2.2 lbs. of body weight, every hour. This means that a 20 lb. (9 kg) lamb that is 9% dehydrated should initially receive a total of 0.81 liter of fluid. Approximately 0.5 liter should be given in the first hour, and the final 0.3 liter given over a 2-3 hour period. Once the 0.81 liter is given, a dose of 45 mLs of fluid should be given every hour until the animal is fully rehydrated and back to normal.
7. In addition to the 5 mLs/2.2 lbs/hour, additional fluid may be required to keep up with continued losses because of diarrhea, etc.

**Prevention:** Dehydration can be prevented when careful attention is given to an animal that is sick, injured, or under severe stress (drought, cold and hot extremes, etc.). Any animal that has diarrhea or another disease that causes fluid to be lost, should receive additional fluids immediately. It is always best to provide additional fluids at the onset of a problem, instead of trying to compensate for dehydration after the fact.