**Solutions**

Regurgitation, increased salivation and bloat can be seen in heavy sedation and all planes of general anaesthesia, but can be held to a minimum by taking a few precautionary steps:

* First, the anaesthetist **should fast the patient for 24 hours** in adults and **2-4 hours in kids or lambs less than 1 month old.** This makes the stomach contents the correct consistency for minimal regurgitation.
* Fasting also helps decrease the pressure exerted by the stomach on the diaphragm and helps increase ventilation.
* Water should be withheld for **6-12 hours**.
* Proper positioning and endotracheal intubation should be considered crucial in small ruminants that are anesthetized
* Bloat can be minimized by passing a rumen tube, and administering **Magnalax through the rumen tube (~480 mls)** to decrease the risk of aspiration

 

**Regurgitation can be avoided by:**

* Administering additional anaesthetic if swallowing, coughing, or chewing are noted while preparing to intubate.
* Lowering the head of the animal and suctioning of the mouth, to facilitate fluid drainage.
* Decreasing the depth of anaesthesia (if using an inhalation agent). Passive regurgitation occurs with deeper levels of anaesthesia and is characterized by a stream of stomach fluid draining from the mouth. Decreasing the depth of anaesthesia (if using an inhalation agent) may cause this response to cease
* Intubating with a cuffed endotracheal tube if ruminants are to be anesthetized for longer than 20 minutes. This helps decrease the risk of aspirating regurgitated rumen contents.

**General considerations:**

* **Acclimation**

Do not use newly arrived animals for experimental procedures until 72 hours after entry into the facility. A one-week acclimation period is recommended. This stabilization period is not required for animals used acutely (anesthetized and euthanized at the end of the procedure), although it is recommended. This provision allows animals to acclimate to the facility and reduces the chance of stress-induced disease, including anaesthetic death

* **Padding and positioning**

Proper padding and optimal positioning of ruminants during surgery is important. Whenever possible, standing surgeries with local anaesthetic blocks are preferred. However, if recumbency is required, place ruminants on a flat surface with enough padding. A minimum of one- to two-inch thickness is recommended for calves, sheep, and goats. Because of their size, ruminants often require mechanical ventilation during anaesthetic procedures.

* **Heat**

Because most anaesthetic drugs cause hypotension and hyperthermia, provide supplemental heat under anaesthesia. Despite having wool, sheep become hypothermic during anaesthesia and standard methods should be used to maintain body temperature (insulating blankets, heating pads, etc.). Regardless of heat source, never place animals directly on the heat.

* **Catheterization**

Following sedation, place an indwelling catheter to administer anaesthetic drugs, emergency drugs, and intravenous fluid support. The most common site for catheter placement is the jugular vein. Appropriate sizes for jugular catheterization: 16G or 18G in sheep, goats, or calves, and 12G or 14G in adult cattle.

* **Fluid support**

It is important to provide supplemental fluid support. Appropriate fluid rates range from 5-10 mls/kg/hour and may vary based on the anaesthetic combination used.

* **Monitoring**

Standard mammalian monitoring techniques apply to ruminants. The goal of monitoring should be to maintain cardiovascular homeostasis and core body temperature.

Understanding the basic physiologic effects of the anaesthetics used is paramount to correctly interpreting monitoring parameters

Parameters to be monitored in anesthetized ruminants include**: anaesthetic depth, heart rate, respiratory rate, oxygen saturation, expired CO2 (EtCO2), temperature, blood pressure, and mucous membrane colour.**

 