Construction of an Inexpensive Liquid Resin Esophageal Cannula for Goats

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Abstract

A simple method for construction of esophageal cannulas for goats employing liquid polystyrenic resin is described. They were made with easily available and low cost materials.

Difficulties occur in research carried out with grazing livestock, one of them being determination of the botanical and chemical composition of ingested matter. One of the existing practical techniques to obtain representative samples of the diet selected by ruminants is esophageal fistulation (Torell 1954). Others have reported modifications in cannula construction aimed at reducing costs, weight, animal stress, and ulcerations in the esophageal mucosa, as well as increasing efficiency and durability (Denney 1981, Taylor and Bryant 1977, Bishop and Froseth 1971). Different types of cannulas have been adequately described by Van Dyne and Torell (1964). A variety of materials have been used in their construction, such as steel, wood, rubber, polyethylene. The objective of this technical note is to describe the construction of an esophageal cannula manufactured with liquid resin.

Material and Method

Figure 1 shows a schematic model of the cannula. The different components of the mould can be seen in Figure 2. The body (A) is made of hard wood, polished by a surface finishing, in which a semicylindrical groove was made with a universal milling machine. This mould has a cover with a drain (B), made of galvanized plate. The connection of (A) and (B) is made with screws (C). Liquid polystyrenic resin¹ with the catalyst at 1.5% concentration (cobalt accelerator), polymerizable at room temperature, is poured in the assembled mould (Fig. 3).

After 50 minutes, the mould is disassembled and there results one half of the entire esophageal tampon. All components are linked by means of a bronze screw and wing nut (Fig. 4). A groove is carved with an emery stone on the parts of the plug which are introduced in the esophagus. The objective of this groove is to facilitate the passing of the ingested food. Figure 5 shows a cannula occluding a goat fistula.

Final considerations

In order to obtain an increase in the cannula diameter, rubber plates of different thickness may be added between both bodies, as a wedge, avoiding the loss of saliva. This alternative replaces the other solution, which is having cannulas of tampons of different diameters, which should be periodically exchanged according to circumstances.

This model has been successfully used for more than 24 months in esophageal fistulas in goats: the cannula was not swallowed, there was no mucosal ulceration or accumulation of forage material, in spite of removal every 20–30 days. Excellent results were also obtained when occasionally used as a ruminal cannula in goats. It may be assumed that there would be no difficulties for application in sheep. A bigger model may be considered possible, for esophageal fistulas in cattle.

Fig. 1. Cannula schematic model (dimensions in mm)

Fig. 2. Component parts of mould.

Cannulas made out of polystyrenic resin, according to the described method, can be considered adequate for the occlusion of esophageal fistula because of: (a) their resistance (they bear occasional falls on hard floor, when dropped by the person handling the animals); (b) light weight (27 g); (c) low cost; (d) simple construction, and (e) manufacturing with easily available materials.

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¹Resin, type 2800 "POLIPERL"®. Haití 1598, Martínez, Buenos Aires, Argentina..

Fig. 3. Assembled mould.

Fig. 4. Assembled cannula and its components.

Fig. 5. Cannula occluding the esophageal fistula.

The cost of this cannula in Argentina, excluding the bronze screw and wing nut, is US \$0.10.

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