

## Summary

Intra-ruminal devices and plastic ear tags were evaluated in sheep and goats (01- 08 years old) in different systems of production in Brazil, where there is no mandatory legislation on traceability for small ruminants. Four electronic devices and two commonly used ear tags were studied in 283 animals distributed in five experiments, in the medium and long terms. The time required for application, the retention rate and the readability of the devices were determined. In Experiment 1, we assessed the long-term retention of plastic ear tags (4.25 g) and mini-bolus (20.0 g) applied on 35 Suffolk male lambs. The retention rate of both devices was 100% after 6 months. At 12 months, the boluses presented 100% retention and the ear tag was 96.9%. The readability for both devices was 100%. In Experiment 2, 57 Suffolk ewes were used. Three intra-ruminal devices (mini-bolus of 21.65 g, n=21; small bolus of 29.52 g, n=18 and standard bolus of 74.4, n=18) were evaluated for ease of application, readability and retention rate. The time of application varied ( $P < 0.05$ ) depending on the devices. The standard bolus showed longer time for application ( $32.8 \pm 6.9$  s) compared to the mini-bolus ( $9.5 \pm 2.7$  s) and small bolus ( $8.27 \pm 2.0$  s), which did not differ ( $P > 0.05$ ). After 6 months, retention rate and readability for all devices was 100%. In Experiment 3, 127 Ile de France ewes reared in semi-intensive systems were used to evaluate three intra-ruminal boluses (mini-bolus of 21.65 g, n=43; intermediate bolus 40.23 g, n=42 and standard bolus of 74.4, n=42). Standard and intermediate boluses showed 100% readability after 6 months. The readability of the mini-boluses was 97.1%. In Experiment 4, 42 Ile de France ewe lambs were used to evaluate the performance of two intra-ruminal bolus (mini-bolus, 21.65 g, n=23; small bolus 29.52 g, n=19) and an ear tag (5.2 g, n=42). The time required for the application, the readability and retention rate of all devices were determined after 6 months. The time of application for the devices ( $P < 0.05$ ) depended on the type of device, and was higher ( $P < 0.05$ ) for the mini-bolus ( $6.34 \pm 2.36$  s) compared to small bolus ( $4.57 \pm 1.83$  s). The intra-ruminal boluses showed 100% of retention and the ear tag, 94.5%. The estimated readability did not change ( $P > 0.05$ ) according to the type of device. In Experiment 5, standard bolus (74.4 g), small ear tag, 50 mm x 15 mm (width x height) and big ear tag (42 mm x 48 mm) were evaluated in 62 crossbreed Boer female goats for six months, in pastures. The mean time required for the application was 21s and did not differ ( $P > 0.05$ ) among the devices. The loss of one big ear tag was registered, and the retention rate was 95.5%. The readability was 100%. All electronic devices have proven to be highly efficient (100% RR) and could be recommended for sheep and goats. Readability failures and losses of visual devices were registered and it should be often highlighted to the producers. Also, an economic analysis performed along with the electronic devices industry can contribute to the farmers' choice.

*Keywords: animal identification, intra-ruminal bolus, ear tag*