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Long-term performance of visual and electronic identification devices in dairy goats

S. Carné,* G. Caja,*[1] J. J. Ghirardi,*[2] and A. A. K. Salama*†
*Grup de Recerca en Remugants, Departament de Ciència Animal i dels Aliments, Universitat Autònoma de Barcelona, 08193 Bellaterra, Spain
†Sheep and Goat Research Department, Animal Production Research Institute, 12311 Dokki, Giza, Egypt

ABSTRACT

Dairy goat kids born during a 3-yr period (n = 97) and their mothers (n = 29) were used for a long-term evaluation of the performance of 9 types of identification (ID) devices. Kids wore multiple ID devices: visual ear tags (V1, tip-tag, n = 47; V2, official, n = 50), electronic ear tags (E1, button-button, n = 46; E2, flag-button, n = 46), electronic rumen boluses (B1, mini-bolus 14 g, n = 92; B2, mini-bolus 20 g, n = 28; B3, standard bolus 75 g, n = 34) and glass-encapsulated transponders injected in the forefeet (T1, 15 mm, n = 75; T2, 12 mm, n = 100). Visual ear tags were applied at birth and removed in yearlings, whereas electronic ear tags were applied after bolusing with B1 (6.7 kg BW and 30 d, on average); B2 were administered in the event of a B1 loss, and B3 in case of a B2 loss and in goat does. At d 60 of age, kids were allocated into 2 groups to evaluate the effects of rearing system on ID. Treatments were: weaned (n = 46), and not weaned (n = 46) where kids suckled a milk substitute until d 150. Readability of ID devices (read/readable × 100) was monitored from 1 to 3 yr of age, depending on device and year of birth. Long-term readability was analyzed using a nonparametric survival analysis. A total of 3.3% infections and 6.5% tissue reactions were reported for electronic ear tags, but ears were fully healed in yearlings. Weaning numerically reduced B1 losses at d 150 (weaned, 84.8% vs. not weaned, 73.3%). Readability of visual ear tags in yearlings (V1, 82.9%; V2, 94.0%) was lower than for electronic ear tags (E1 and E2, 100%). Mini-bolus readability in yearlings did not differ by type (B1, 71.4%; B2, 84.6%) or with visual ear tags. No effect of inject type was reported (T1, 92.0%; T2, 96.0%). Survival analysis after yr 3 gave the greatest readability value for E1 (100%), which did not differ from B3 (96.8%). The lowest readability was estimated for B1 (66.3%), followed by E2 (79.8%), B2 (81.4%), and T1 (90.4%). In conclusion, button-button electronic ear tags and standard boluses were the more efficient devices under our conditions, their readability values being greater than injects, electronic mini-boluses, and visual and flag-button electronic ear tags. Transponders injected in the forefeet and mini-boluses used here are not recommended in practice. Further research on E1 and B3 electronic devices should be done in a higher number of goats to confirm the current results.
Key words: bolus, ear tag, electronic identification, goat

INTRODUCTION

Electronic identification of sheep and goats has become an important issue in the European Union since the publication of Regulation CE 21/2004 (recently amended by SANCO/1427/2008), which establishes a double identification (**ID**) system for replacement animals with both a plastic ear tag and a second device to be chosen by each member state. When the sheep and goat population within a member state is greater than 600,000 animals, the second means of ID must be a passive radio-frequency device. Double ID was expected to be mandatory in 2008 but has been put off until 2010, although it has been officially deployable since July 2005. In Spain, the electronic bolus has been used as the second means of ID since January 2006 (Real Decreto 947/2005).

Optimum retention of boluses in sheep and cattle has been achieved by optimizing their physical features (Caja et al., 1999; Fallon, 2001; Ghirardi et al., 2006). However, bolus retention in the case of goats has shown remarkable variability in practice, ranging from 89.7 to 99.6% (JRC, 2003; Capote et al., 2005; Pinna et al., 2006). That is why current Spanish legislation (Real Decreto 947/2005) permits the use (under authorization) of transponders injected in the metacarpus (forefoot) in goats. Although injection to this body site may prevent carcass contamination, animals cannot be used for consumption. Little information is available on the comparison of injectable transponders, electronic ear

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[1]Corresponding author: gerardo.caja@uab.cat
[2]Current address: Rumitag, Esmeragda 19-21 Sobreàtic, 08950 Esplugues de Llobregat, Barcelona, Spain.

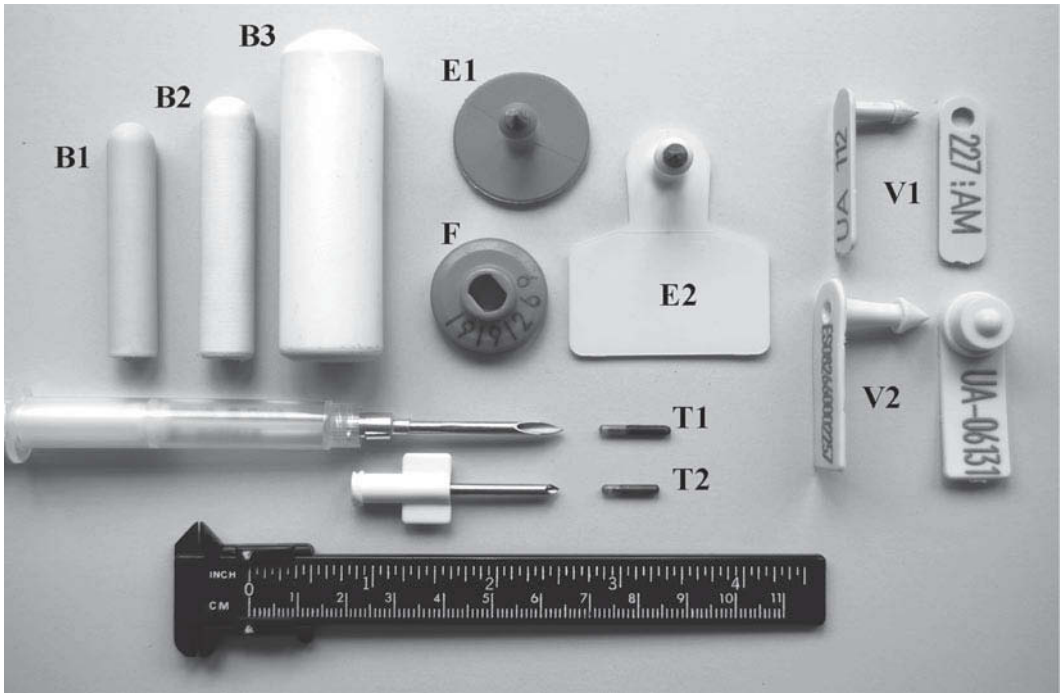

Figure 1. Electronic and visual devices used for the identification of dairy goats. V1 = tip-tag ear tag (Azasa-Allflex, Madrid, Spain); V2 = official tamper-proof ear tag (Azasa-Allflex); B1 = mini-bolus 13.7 g and 51.0 × 10.5 mm (Rumitag, Esplugues de LLobregat, Spain); B2 = mini-bolus 20.1 g and 56.4 × 10.5 mm (Rumitag); B3 = standard bolus 75 g and 68.2 × 21.0 mm (Rumitag); E1 = ear tag made of plastic button male piece (Azasa-Allflex) and electronic button female piece (Allflex Europe, Vitré, France); E2 = ear tag made of plastic flag male piece (Azasa-Allflex) and electronic button female piece (Allflex Europe); T1 = injectable transponder 15 × 2.1 mm (Avid Microchip España, Barcelona, Spain); T2 = injectable transponder 12 × 2.1 mm (Cromasa, Berriozar, Spain).

tags, and boluses in goats. In contrast to goats, over 99% retention has been achieved in lambs by using small size boluses (Garín et al., 2005; Ghirardi et al., 2007). No information is available on the use of electronic ID devices in replacement goat kids. The aim of this study was to investigate the long-term performance of visual and electronic ID devices applied in kids and dairy goats, as well as to evaluate the influence of rearing management conditions on the variability of the retention rate of small size electronic boluses.

MATERIALS AND METHODS

The experimental procedures and animal care conditions were approved by the Ethical Committee on Animal and Human Experimentation (Reference CEEAH 606/06) of the Universitat Autònoma de Barcelona. A total of 29 goat does and 97 goat kids of Murciano-Granadina dairy breed from the Experimental Farm of the Servei de Granges i Camps Experimentals (S1GCES), Universitat Autònoma de Barcelona, were used. Goat does were bred for an annual kidding season in the autumn and kidded during fall of 2004 (n = 27), 2005 (n = 18), and 2006 (n = 18), giving birth to 45, 26, and 26 kids, respectively. Kids were under study for 3, 2, or 1 yr depending on the year of birth.

Visual Identification

Each kid was identified at birth with 1 visual ear tag applied on the left ear. Two types of rectangular visual ear tags made of plastic (Figure 1) from the same manufacturer (Azasa-Allflex, Madrid, Spain) were used; ear tags features (weight, flag dimensions and pin dimensions) were "tip-tag" ear tag (**V1**; 1.4 g, 35.5 × 9.3 mm, 15.5 × 3.9 mm; opened female piece; n = 47) commonly used by the farmers for their low cost; and, official tamperproof ear tag (**V2**; 2.8 g, 40 × 14.5 mm, 22 × 5 mm; closed female piece; n = 50) made to fulfill the new requirements of the European Union Regulation 21/2004. Both V1 and V2 ear tags were considered temporary ID and were removed at 12 mo of age when yearling kids joined the breeding herd. All ear tags were printed with both a serial animal number (7 digits) and the holding number (14 digits) as required by Regulation 21/2004.

Goat does wore 2 flag plastic ear tags of large size (48 × 38 mm, yellow color; Azasa-Allflex) in the left ear.