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TECHNICAL NOTE: ELECTRONIC IDENTIFICATION OF LIVE RABBITS; PRELIMINARY STUDY TO IDENTIFY A BODY INJECTION SITE

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Abstract: Identification and monitoring of farm animals are effective tools for traceability. Current livestock identification systems are not 100% efficient and present certain disadvantages such as losses, breakages and an unreadable identification code. The use of injectable transponders may be a reliable method for individual identification, providing an improvement in data recording and farm management. The aim of this experiment was to evaluate the practical aspects concerning injection technique, readability and retrieval of injectable transponders in live rabbits. A total of 60 rabbits (40 fatteners and 20 does) were injected with 23x3mm passive FDX-B transponders (Datamars, Switzerland), inserted into a needle, wrapped in a sterilised package and applied by a specific injector (Planet ID, Germany). Two different body sites were evaluated: back scapular (n=30) and armpit (n=30) position. The readings of the transponders were performed by using an i-max plus portable reader (Datamars, Switzerland) at different times: before and after injection, one day, one week and one month after injection. Does were read monthly during 1 year, while fatteners before the slaughtering process. To evaluate the effect on productive performance, fattening rabbits were compared to a control group. The readability of transponders injected in fatteners until slaughter and in does until 1 year after injection was 100%. No harmful effects were observed and no significant difference in weight was found in the two injection groups, compared with the control group. The retrieval was performed by a single operator at skinning, with 100% of transponders recovered. The site of the injection did not affect the migration rate, although it was high in both cases. The feasibility of subcutaneous transponder injection in live rabbits is recommended in the two body positions analysed. However, specific training and operator experience are necessary to improve the efficiency of this identification system.

Key words: rabbit, injectable transponder, electronic identification.

INTRODUCTION

A reliable individual identification system is necessary in rabbits in order to organize mating programs in selection centres, pets, laboratory and show rabbits. Traditional identification systems (i. e. ear tags, tattoos) are economical and easy to apply; however, they present certain disadvantages (i. e. problems of reading, loss, etc.). The use of passive transponders for electronic identification may be a reliable method of individual identification and traceability, providing an improvement of data recording and farm management (Ribó, 1996). The aim of this experiment was to define a suitable injection location for transponders in live rabbits, comparing two body sites: back scapular and armpit. The injection technique, the readability of the transponders at fixed times, the effect of the injection body on growth performance and animal health, and the migration rate of the transponders in both body sites were evaluated.

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MATERIAL AND METHODS

Experimental design

Sixty commercial crossbreed rabbits reared under standard management condition in an intensive farm in the North of Italy were electronically identified: 40 fatteners (55 days old, 20 males and 20 females) and 20 does (120 days old). Animals were identified by means of a passive injectable transponder (FDX-B; 23×3mm; T-IS8430, Datamars, Switzerland), encapsulated in biocompatible glass, inserted into a needle (65×3mm), wrapped in a sterilised single-use package and a specific injector (Planet ID, Germany) was used to apply the electronic device. Two body sites were studied to evaluate the performance of subcutaneous transponder injection: 30 rabbits (10 does and 20 fatteners) were injected in the back scapular position and 30 rabbits (10 does and 20 fatteners) were injected in the armpit position. The back scapular position was chosen as being the applied method in dogs, cats and horses, and with previous research on transponder injection in rabbits (Climent *et al*., 2000). The armpit site has been previously studied in sheep, goats and cattle (Caja *et al*. 1998, Conill *et al*., 2000; Conill *et al*., 2002). Fattening rabbits were weighed before injection, one week and one month after injection, and before slaughter. Their weight was compared with a control group of untreated animals (n=40) to evaluate the effect of manipulation and injection on weight gain.

Protocol of injection

The protocol of injection was as follows:

- no previous animal preparation was carried out before injection;
- two operators were required: one person restrained the animal while the other injected the transponder;
- rabbits were immobilized on a board lying on their backs (back scapular position) or on their left side (armpit position), holding the head and the forelegs by one hand and the hind legs by the other ;
- before proceeding, the injection point was checked and anatomical references were localized for the two body sites: in the space between the shoulder blades for the back scapular position (Figure 1) and in the space between the thoracic wall and the caudal muscles of the left arm for the armpit position (Figure 2);
- when the injection point was located, the operator lifted the skin to facilitate needle penetration;
- after injection the injection point was disinfected to avoid possible infections.

A control was carried out the day after injection, to check transponder retention and any effects on the animals' health.

Readability

The transponders were read by means of an i-max plus portable reader (Datamars, Switzerland), connected to a notebook to record the transponder identification codes. To check the correct operation of the transponders, they were read at fixed times: before injection, after injection to assure correct application, one day, one week and one month after injection, before the slaughtering process in fatteners and each month for 1 year in does.

Retrieval at slaughterhouse

The recovery feasibility (time and migration rate) were evaluated for each slaughtered animal. The transponders were retrieved by an operator during skinning and read after recovery to check whether they were working or not after the slaughtering process.

Figure 1. Anatomical reference for back scapular position.

Figure 2. Anatomical reference for armpit position.

Statistical analysis

The weight of animals was analysed by the GLM procedure (SAS, 1999), taking the location of injection as fixed effect (no injection, back scapular or armpit position) and using the initial body weight as covariate ($Y_{i,j,k} = \mu + \alpha_i + b_1x_1 + \varepsilon_{i,j,k}$, when $Y_{i,j,k}$ dependent variable, μ = overall mean; α_i fixed effect of injection (i=1,3), b_1x_1 covariate effect of weight, $\varepsilon_{i,j}$ general error). Differences in migration rate were calculated by $\chi 2$ test (SAS, 1999).

RESULTS AND DISCUSSION

The time needed to perform the procedure (from restraining the animal to the post-injection reading) was on average 41.8 ± 4.1 s for the back scapular position and 30.0±5.3 s for the armpit position. Less injection time for different subcutaneous positions was needed (Climent *et al.*, 2000) in animals treated for 1 or 4 weeks respectively, showing that injection time could increase with the age. Table 1 summarizes the results obtained in terms of readability, harmful effects and retrieval per body

Table 1: Readability, harmful effects and retrieval results in the experimental animals.

		Back scapular		Armpit		Total
		Fatteners	Does	Fatteners	Does	
Animals died after injection (n)		0	0	0	1	1
Transponder losses (n)		0	0	0	1	1
Injection errors (n)		1	0	0	0	1
Injection reliability (%)		96.7		93.3		95
Readability (%)		100		100		100
Retrieval of transponder (%)		100	-	100	-	100
Close to injection site	n	18	-	17	-	35
	%	90		85		87.5
Migrated	n	2	-	3	-	5
	%	10		15		12.5

region and animal group (fatteners and does). One doe died immediately after injection in the armpit position. The result of the necropsy showed that death was caused by excessive penetration of the needle, proving the importance of the correct restraint of animals (Pinna *et al*., 2004). Nevertheless, the length of the needle should be further investigated in order to assure animal safety. One transponder injected in the armpit position was lost because the needle passed through the skin, due to lack of experience of the operator. In another animal the transponder was injected into the scapular muscle, instead of the subcutaneous back scapular position. Climent *et al*. (2000) also reported the risk of technical failure of the subcutaneous injection. Injection reliability reached a maximum value of 95% and was influenced by training in injection performance. Both the death of the doe and the loss of the transponder were due to inexperience and loss of concentration in the operator, which was also described by Climent *et al*. (2000). No harmful effects of the transponder injection were observed in the animals. Body weight differences were not significant for the two body sites of injection, compared to the control group, (final weight: armpit 2955 ± 225 g; back scapular 2998 ± 174 g; control group 2899 ± 211 g), confirming that the procedure did not affect the performance and health status of the animals. Readability in fatteners until slaughter and in does until 1 year after injection, as well as retrieval during the slaughtering process, were 100%, in agreement with the results obtained in previous studies (Climent *et al*., 2000; Pinna *et al*., 2004). The injection site did not statistically affect the migration rate: in the armpit position three transponders were found to have migrated to the left fore leg; from the back scapular position one transponder was recovered from the right side of the chest and one from the armpit. Even if migration rate is high, the risk of carcass contamination is minimal, since the transponders were retrieved from all the injected animals at skinning and migration always occurred in the subcutaneous space.

CONCLUSIONS

Injection of a transponder in the back scapular and armpit position is easy to apply and can be a practical tool for the individual identification of live rabbits. The efficacy and reliability of this identification system can be improved by specific operator training and improved design of the injection tools. The results showed that the armpit position assures food safety, as no devices were retrieved from inside the carcass. However, it would be advisable to confirm these results with further tests. On the other hand, the back scapular position proved to be more reliable and easier to apply, assuring both animal safety and the minimum loss of identification.

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