INTRAPERITONEAL ELECTRONIC IDENTIFICATION OF RABBITS

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ABSTRACT

The authors propose an innovative technique of intraperitoneal electronic identification in rabbits using an injectable HDX 32.5×3.8 mm transponder. A steel shot injector was used to implant 79 Half Duplex passive bio-glass encapsulated injectable transponders in abdomen cavity of 37 males and 42 females rabbits 62 days old. 44 animals (24 males and 20 females) were slaughtered at 83d of age and averaged live weight of 1,975 kg. The transponders were recovered easily in abdominal cavity by the operator in slaughter chain. The readability, the localisation and effects on health of transponders were evaluated *in vivo* during 6 months. The readability of transponders in abdomen was checked with a hand-held reader immediately after transponders application and then at 1d, 7d, 30 d and 240 d. In 4 rabbits (2 males and 2 females) transponders location in abdomen cavity was monitored by using a X-Ray apparatus at 0d, 1 d, 30d, 240 d after transponders application. Health status and performances of rabbits were not modified by transponders presence in abdomen during the control period. In restrained animals the transponders showed a 100% readability. Farmers and technicians expressed their interest on the use of the electronic identification system. The use of the intrabdominal electronic identification can be an interesting innovative method for tagging rabbits, improving the traceability of animals and meat along productive chain.

Key words: rabbit, animal identification, injectable transponder, meat traceability.

INTRODUCTION

Tattoos and ear tags traditionally used for rabbits identification do not satisfy farmers and researchers requirements (FRAPPAT *et al*., 1993; CHAISERMARTIN, 2003). Some current problems due to the lack of a reliable identification system are, between others, difficulties of knowing the effective number of animals in farms and unidentified animals. Some research have been performed in the EU on the reliability of the electronic identification of animal especially of ruminants with successful results (CAJA *et al*., 2003). However, because data on EID in rabbits are currently not available this work evaluates the possibility of the use of electronic identification system in this animal species.

MATERIALS AND METHODS

Injectable transponder

79 glass encapsulated injectable transponders (Half Duplex technology 32.5x3.8mm; Gesimpex Comercial, Barcelona, Spain; Tiris, Almelo, The Netherlands) were used. Transponders are in accordance with current ISO Standards (ISO 11784 and ISO 11785) with an animal identification code of 64 bits factory programmed, read-only type and working at an activation frequency of 134.2 kHz (TIRIS™, 1994). Main characteristics of transponders are shown in Table 1.

Reader

A hand held reader Gesreader 2S ISO® (Gesimpex Com. S.L., Barcelona, Spain) was used to perform reading in static conditions immediately after the tagging and during control readings of the electronic code of animals. The sex and date of birth of the animal was linked with the electronic identification code. The reader was equipped with a the RS-232 interface to transfer all these data to a PC, as an ASCII file and to a portable PC HP Omnibook XE.
Reading devices were selected in accordance with the equipment tested and certified for the IDEA Project (KORN, 2001).A data management software was specifically designed for the experimental data base of the tagged animals.

Animals

A total of 79 rabbits, 46.8 % males (n=37) and 53.2% females (n= 42) located at a intensive farm of the Sardinia island (Italy) were electronically identified. 44 animals 54.5 % males (n=24) and 45.5% females (n= 20), were slaughtered at 83 days of age and averaged live weight 1.975 Kg. The transponders presence and functioning was recorded under farm conditions during life of animals.

Electronic Identification

Injectable transponders were applied by the same operators with rabbits manually restrained. A metallic shot injector (Gesimpex Com. S.L., Barcelona, Spain) was used according to the original procedure here described. The injection site is located along the *linea alba* at the level of the third pair nipples and the needle of injector is inserted in an angle of 45-50° in direction of the head. After that the needle of applicator is introduced intraperitoneally through the *linea alba* the transponder is deposited in the abdominal cavity. The injection has done without anaesthesia very carefully and under hygienic condition after that the furs with hair was shaved and disinfected.

Table 1. Technical characteristics of the transponder

	Transponder
Dimension (L x D)	32.5 x 3.8 mm
Shape	Cylindrical with rounded bases
Weight	0.83 g
Material	Glass
Battery	Passive (without battery)
Working frequency	134.2 kHz
Code programming	Read-only type, factory programmed code
Memory	112 bits (animal identification code 64 bits)
Reading distance	Portable reader: > 25 cm
Penetration	Reading possible through any non-metallic material
Working Temperature	From - 25°C to + 85°C

Table 2. Main steps in tagging procedure

	Procedures
Step 1	Prior tagging reading to verify the correct operation of the transponder
Step 2	Transponder inoculation into the animal. Linkage of the animal data to the transponder identification code
Step 3	Post tagging reading to verify the functioning of the transponder

Reading controls

With the objective to evaluate the presence and regular functioning of transponder on the inside of abdomen of the animals, reading controls were performed immediately after injection and successively 1d, 7d, 30d, 240 d, using the hand-held readers. The Readability [R (%)] of a transponder - defined as the ability of a transponder to be in order on the inside of the animal's body and read in static conditions - was calculated with the following formula (PINNA *et al*. 2003):

$$R\ (\%) = (\text{Transponders read} / \text{Animals with transponder}) \cdot 100$$

The behaviour and health status of the animals were checked during all the experimental period to verify behaviour alterations or negative effects of the administration and presence of the transponder on animal welfare.

X-ray analysis

With the objective to evaluate the location in the abdomen cavity 4 rabbits, 2 males and 2 females, was studied using a radiographic apparatus (Maxivet High Frequency, Multimage srl Cavaria –VA – Italy) immediately after the injection of the transponder and

successively 1d, 7d, 30d, 240d as shown in Table 3. In each subject were performed 2 *X*-ray analysis, (ventral-dorsal and lateral-lateral) aiming to evaluate the location of the transponder between abdominal viscera.

RESULTS AND DISCUSSION

Transponder inoculation

The method for the Intraperitoneal inoculation of a glass encapsuled HDX 32.5x3.8mm transponder in abdomen cavity of rabbits described in this experiment is result easily feasible and well realizable under farm condition where we operate. Only 1 case of injuries (1.26%) were observed in all 79 animals studied (Table 3). A vescical perforation was determined during the injection of transponder because abrupt movements of the animal. All remaining 78 rabbits have been easily tagged and controlled, without any registrations of technical disturbances or infections. The presence of the transponders in abdominal cavity were well tolerated and none negative reactions or behaviour alterations were observed in animals during all experimental period.

Readability

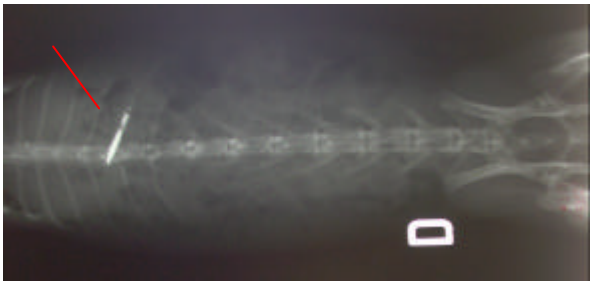
The reading results and readability are presented in Table 3. No problems were found during the control reading activity. Reading after tagging and at 1 d, 7 d, 30 d, 240 after tagging showed 100% readability. Using a hand-held reader in static conditions and on restrained animals the transponders showed a 100% readability.

Table 3. Reading results and readability (%) of the transponders

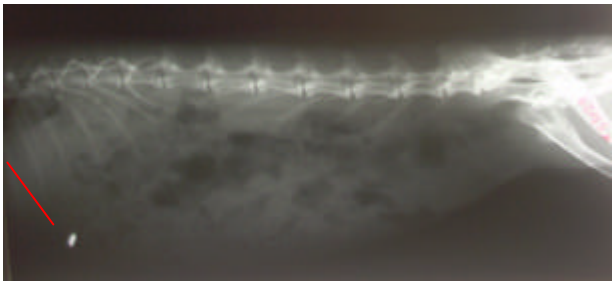
Reading Controls	Tagged Rabbits (n.)	Slaugthered Rabbits (n.)	Dead Rabbits (n.)	Successful Readings (n.)	Readability %
At tagging	79	/	1	78	100
1 d	78	/	/	78	100
7 d	78	/	/	78	100
30 d	78	/	/	78	100
83 d	78	44	/	78	100
240 d	34	/	/	34	100

X-ray analysis

The ventral-dorsal (Picture 1) and lateral-lateral (Picture 2) *X*-ray analysis performed in 4 rabbits highlighted the location of the transponder between abdominal viscera during experimental period without any abdominal complication.



Picture 1. Ventral-dorsal X-ray analysis



Picture 2. Lateral-lateral X-ray analysis

Slaughterhouse

All the transponders were easily recovered from abdominal cavity of 44 tagged rabbits by the operator in slaughter line. A lot of transponders were positioned in the omentum fat. None local or intrabdominal inflammatory reaction or visceral lesion were observed in slaughtered rabbits. When the trial was carried out the cost of each transponder was about 5 euros. This cost could certainly appear quite considerable if related to the commercial value of rabbits for meat production, even though in prospect there is a good possibility that the cost of transponders would considerably decrease. However, in terms of cost/benefit ratio, the average price of 5 euros appears to be reasonable if related to the economic value of breeders with high genetic merit or to groups of animals reared for experimental topics. As a matter of fact under such circumstances the intraperitoneal method of electronic identification could offer considerable improvements in terms of identification of the individual subject especially when numerous and repeated controls are requested. In fact, as well known, when data about individual animals are collected and recorded, very frequently concrete aspects related to the identification certainty are also present and they are not always easily soluble.

CONCLUSIONS

Obtained results on readability and good intrabdominal retention of transponders show that with the proposed electronic identification system, it is possible to perform a reliable control on the identification of the animals during life and at slaugthering easier and more reliable than with the conventional identification system currently used.
Further investigations are in progress during whole life time of animals to increase knowledge for a future use in field and laboratories.

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