Effect of intraperitoneal electronic identification on productive performance of Sardinian suckling lambs

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RIASSUNTO – Effetto dell'identificazione elettronica sulle performance produttive di agnelli da latte in Sardegna. *40 agnelli di razza Sarda a un'età compresa tra 1 e 7 giorni e peso vivo compreso tra 2,50 e 6,15 kg, sono stati suddivisi in due gruppi sperimentali di 20 soggetti ciascuno: il gruppo T è stato identificato elettronicamente mediante un transponder intraperitoneale; l'altro (gruppo C) è stato tenuto come controllo. Gli agnelli di entrambi i gruppi sono stati controllati clinicamente, pesati settimanalmente e infine macellati ad età compresa tra 28 e 35 giorni. Nel gruppo T è stata verificata la leggibilità del transponder sugli animali in vivo e post mortem nella catena di macellazione. Incremento ponderale medio giornaliero (268,7* vs. *251,1 g), resa in carcassa "alla romana" (64,12* vs. *63,78%) e resa in carcassa (52,74* vs. *53,08%) non hanno mostrato differenze statisticamente significative fra i gruppi T e C. La leggibilità e il recupero dei transponders sono risultati del 100%.*

Key words: electronic identification, lambs, productive performance.

INTRODUCTION – The electronic identification could represent a further step to improve the traceability of meat, considering that, starting from the 1st of January 2008, this method will be compulsory in the whole EU (Reg. CE n. 21/2004).

The "Agnello di Sardegna" is a Protected Geographic Identification product (Provv. 13/03/2001) and it has to match up a series of requirements, such as the identification of animals in 20 days time from birth. In a previous work, Pinna *et al.* (2004) showed the results of a survey carried out for the development of the intraperitoneal identification systems in lambs. In the present work, the effects on the main productive *in vivo* and *post mortem* performance are taken into account.

MATERIALS AND METHODS – 40 male lambs belonging to Sarda breed between 1 and 7 days of age, have been weighted and then segregated into two groups, consisting of 20 lambs per each: a group (T group) has been electronically identified by using an injecting HDX 32.5×3.8 mm bio-glass encapsulated transponder 134.2 kHz (TIRIS™), according to the technique studied by Pinna *et al.*,(2004), that involves the inoculation of the transponder in abdomen cavity. Transponders are in accordance with current ISO Standards (ISO 11784 and ISO 11785). The reading of the transponder is performed through a hand-held reader Gesreader 2S ISO® (Gesimpex Com. S.L., Barcelona, Spain) that holds an integrated antenna and a stick antenna of 60 cm. The presence and the functioning of the transponder in the animals' abdominal cavity was detected by a read-

ing immediately after injection, followed by 4 further readings (after 7d, 14d, 21d and 28d) and in the slaughterhouse, using the above mentioned portable reader type. Readability (R%), defined as ability of transponder to be operative in the animal's body and possibility to be detected by static reading, was calculated by the formula (Pinna *et al.*, 2004):

R (%) = (number of transponder read / number of lambs with transponder)*100

The animals' health was clinically checked during all the experimental period, to verify the behavior modifications or clinical symptoms due to the transponder presence in animals. *In vivo* measures were collected according to ASPA (Gigli *et al.*, 1991). *Post mortem* items were checked in order to evaluate the carcass yield and fatness and also to verify the absence of any anatomical lesion due to the presence of the transponder in the inter-viscera place. The C group has been tagged traditionally by using plastic collars. *in vivo* and *post mortem* data have been compared by T Student test (T *vs.* C group).

RESULTS AND DISCUSSION – Lambs of both groups were clinically healthy throughout the experimental trial. A lamb of the C group died because of a gastroenterial syndrome. In each lamb of T group the recovery of the small wound in the point of injection of the transponder went on well in a week time, leaving just an imperceptible scar checked during inspection before slaughter. Lambs of T group did not show any symptom due to the presence of the transponder in abdominal cavity, neither any anatomo-pathological lesion at *post mortem* inspection. Table 1 shows live weight and daily average growth of animals of the two groups and readability of transponders in animals of T group during the experimental trial. The lambs weights and daily growth are in agreement with several Authors (Bonomi *et al.*, 1991; Brandano *et al.*, 1970) and do not show significant differences between the two groups. The readability of transponders performed *in vivo* in the lambs of C group was at 100%.

Table 1. Live weight of animals of the two experimental groups (mean±s.d.) and readability (%) of transponders in animals of T group.

	T group readability (%)	T group weight (g)	C group weight (g)	Significance P<0.01
Number of animals	20	20	19	
Transponder application	100	3295±817	3447±889	n.s.
7 d	100	4792±1049	4911±1098	n.s.
14 d	100	6652±1305	6550±1280	n.s.
21 d	100	8555±1515	8508±1473	n.s.
28 d	100	10820±1404	11003±1452	n.s.
Average daily growth				
0-28	-	269±34	251±29	n.s.

Table 2 shows *in vivo* somatic measures recorded per each group before slaughtering. *in vivo* measures do not show significant differences between the lambs of T and C group.

Table 3 shows *post mortem* performance from the two experimental groups and the readability and collection of transponders inserted in animals of T group. Also *post mortem* productive performances do not show significant differences between the lambs of the two groups. The readability of transponders performed in the slaughtering chain was 100%. The collection of transponders from abdomen cavity was successful at 100%. 7 transponders, that represent the 28.7% of the totality, resulted persistently enclosed in the omentum fat, while the 71.3% was free in abdomen cavity. No harm for viscera and perivisceral fat was observed at *post mortem* inspection.

Table 2. *In vivo* measures (cm) of animals of the two experimental groups (mean±s.d.)

Number of animals	T group 20	C group 19	Significance P<0.01
Withers height	45.8±1.54	46.7 ±2.11	n.s.
Chest height	15.8±0.85	16.2±0.85	n.s.
Chest width	10.6±0.81	11±0.79	n.s.
Chest girth	48.9±1.30	49.5±1.32	n.s.
Body length	39.2±1.46	40.1±1.60	n.s.

Table 3. *Post mortem* performance of the two experimental groups (mean±s.d.) and readability (%) and collection (%) of transponders in animals of T group.

Number of animals	20	T group 19	C group P<0.01	Significance
Carcass yield "alla romana"	(%)	64.1 ± 2.1	63.8 ± 2.3	n.s.
Carcass yield	(%)	52.7 ± 1.7	53.1 ± 2.0	n.s.
Fatness	(score 1-5)	3 ± 0.25	3 ± 0.25	n.s.
Readability	(%)	100	-	
Collection	(%)	100	-	
Transponders collected in the omental fat	(%)	28.7	-	

CONCLUSIONS – Results obtained in this research, lead us to express the dependability of the electronic identification system adopted for milking lambs. Intraperitoneal electronic identification by using bio-glass encapsulated transponder showed neither clinical symptoms, nor pathological lesions at inspection *post-mortem*, throughout the trial. The productive performance of both groups lead us to assess that the intraperitoneal electronic identification represents a reliable method useful for traceability of milking lambs. In particular, it is suitable for the Protected Geographic Identification meat of "Agnello di Sardegna".

REFERENCES – **Bonomi**, A., Sabbioni, A., Quarantelli, A., Venturiello, A., 1991. L'integrazione con grassi di diversa origine dei latti artificiali impiegati nell'allevamento dell'agnello leggero. Riv. Soc. It. Scienza Alim. XX, 3, 129-136. **Brandano**, P., Rossi, G., Lai, P., Cosseddu, A.M., 1970. Prova comparatrice fra agnelli di razza Sarda e meticci Wuttemberg x Sarda, allevati con la somministrazione meccanizzata di latte ricostituito. Alim. Anim. 14:49-55. **Gigli**, S., De Franciscis, G., Girolami, A., Pagano Toscano, G., Ubertalle, A., 1991. Metodologie relative alla macellazione degli animali d'interesse zootecnico e alla valutazione e dissezione della loro carcassa. A.S.P.A., Ismea, Roma. **Pinna**, W., Sedda, P., Delogu, G., Monello, G., Sionis, G.F., Solinas, I.L., 2004. Identificazione elettronica intraperitoneale nell'agnello da latte. Atti XVI Congresso Nazionale SIPAOC, Siena, 313. **Provvedimento 13 marzo**, 2001. Iscrizione della denominazione "Agnello di Sardegna" nel registro delle denominazioni di origine protette e delle indicazioni geografiche protette. G.U. n. 73 del 28-3-2001: 55-58. **Reg. (CE) n. 21/2004** del Consiglio del 17-12-2003.