

EFFECT OF ELECTRICAL STIMULATION ON THE SENSORY CHARACTERISTICS OF SPRINGBOK (ANTIDORCAS MARSUPIALIS)

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Abstract

The effect of electrical stimulation of Springbok carcasses on the sensory qualities of *M.longissimus*, was evaluated in a completely randomised experimental design. Analysis of variance was performed on the data and Tukey's LSD were calculated at a 5% significance level to compare treatment means (SAS, 1990). Descriptive sensory analyses were performed on the meat samples. A trained six-member panel evaluated the meat for the following sensory attributes: Springbok aroma intensity, initial impression of juiciness, sustained juiciness, tenderness, residue and overall Springbok flavour by means of a eight-point structured line scale. The panellists were seated in individual booths in a temperature and light controlled room, receiving a set of two samples served in a complete randomised order. Applying electrical stimulation to Springbok carcasses were found to have had no significant effect ($P>0.05$) on the sensory characteristics of aroma intensity, initial juiciness, sustained juiciness, tenderness, residue and flavour.

Preparation of samples

Preparations of carcasses: Electrical Stimulation (ES) was applied on Springbok carcasses after death and the sensory qualities compared to samples where no electrical stimulation was applied (NES). *M.longissimus* samples from the two treatments (ES and NES) were defrosted at a temperature of 2-4°C for a period of 24 h. Meat samples was cut to uniform size and placed on foil-covered metal racks. Each metal rack was placed in a coded oven bag and a probe inserted into the centre of the meat. Samples were cooked at 160°C in two Defy 835 ovens connected to a computerised electronic temperature control system (Viljoen, Muller, De Swardt, Sadie & Vosloo, 2001) to an internal temperature of 68°C. The meat was allowed to rest for 5 minutes, in which time an endpoint temperature of 72°C were reached. Cubed samples (1.5 x 1.5 cm) were taken from the middle of each sample and individually wrapped in aluminium foil. The samples were placed in preheated, coded glass ramekins in a preheated oven of 100°C and evaluated within 10 minutes.

Sensory analysis

Descriptive sensory analyses were performed on the meat samples. A trained six-member panel evaluated the meat for the following sensory attributes: Springbok aroma intensity, initial impression of juiciness, sustained juiciness, tenderness, residue and overall Springbok flavour by means of a eight-point structured line scale. Table 1 depicts the definitions of the attributes used in the sensory analyses. The panellists were seated in individual booths in a temperature and light controlled room, receiving a set of two samples served in a complete randomised order. Crackers, apple slices and distilled water were used to cleanse the palate between samples.

Table 1: Verbal definitions of sensory attributes evaluated

ATTRIBUTE	VERBAL DEFINITION
Springbok aroma intensity	Take a few short sniffs as soon as you remove the foil.
Initial impression of juiciness	The amount of fluid exuded on the cut surface when pressed between the thumb and forefinger
Sustained juiciness	The impression that you form after the first two to three chews between the molar teeth
First bite	The impression of tenderness after the first two the three chews between the molar teeth
Residue	The amount of residue left in the mouth after the first twenty to thirty chews
Overall Springbok flavour	This is a combination of taste and swallowing

Statistical analysis of data

The experimental design consisted of a randomized complete block design with two treatments (ES and NES) replicated in 10 blocks. Analysis of variance was performed on

the data and Tukey's LSD were calculated at a 5% significance level to compare treatment means (SAS, 1990). See addendum B for statistical analysis of the data.

Results and discussion

The panel could not detect a significant difference ($P>0.05$) between the two treatments (electrical stimulated and not electrical stimulated) in any of the sensory attributes evaluated. Mean values for the attributes evaluated are given in Table 2. Although not significant ($P>0.05$), mean values for the electrical stimulated sample (ES) was higher than that of the NES sample for initial juiciness, sustained juiciness, tenderness and flavour. Mean values for the NES sample was higher for aroma intensity and residue, although this was not significant ($P>0.05$).

Table 2: Mean values for the sensory attributes evaluated

Attribute	Treatments		Tukey's LSD (5%)
	NES	ES	
Springbok aroma intensity	6.05 ^a	6.00 ^a	0.360
Initial juiciness	6.60 ^a	6.75 ^a	0.286
Sustained juiciness	6.43 ^a	6.52 ^a	0.256
Tenderness	6.43 ^a	6.55 ^a	0.390
Residue	6.68 ^a	6.67 ^a	0.245
Flavour	6.15 ^a	6.32 ^a	0.418

^aValues in the same row with different superscripts differ significantly ($P\leq 0.05$)

Conclusions

The panel could not detect a significant difference ($P>0.05$) between the two treatments (electrical stimulated and not electrical stimulated) in any of the sensory attributes evaluated (aroma intensity, initial juiciness, sustained juiciness, tenderness, residue and flavour).

References

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