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## The effect of ageing time on the organoleptic properties of farmed fallow deer (*Dama dama*) *longissimus lumborum* meat (#242)

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### Introduction

Post-harvest ageing of meat plays a pivotal role in palatability. Controlling the key factors affecting the rate and extent of ageing is highly important to the development of effective strategies to improve meat quality (Brad Kim et al., 2018). Fallow deer (FD) is one of the most abundant deer species reared under farm conditions throughout the world, rising in popularity within Europe (Kudrnáčová et al., 2018). Farming deer has the potential of providing a regular meat supply of uniform quality to the market in comparison to hunted deer. However, the optimum length of ageing of farmed deer to ensure a product of consistent quality is unknown. Thus, the purpose of this study was to determine the influence of different ageing times on the sensory characteristics of venison from farmed fallow deer bucks.

### Methods

Twenty-one farmed 20 months old FD bucks were slaughtered. Animals were stunned, bled on farm and transported to the abattoir for processing. After chilling for 24 h, both *longissimus lumborum* (LL) muscles were collected, divided into four, vacuum packed and randomly assigned to one of four post-mortem ageing periods (7, 14, 21 or 28 days) at 4 °C. Each sample was frozen after their respective ageing period. Thawed samples of LL were divided into 2 cm steaks and cooked on a double plate grill until an internal temperature of 70°C. They were immediately cut into ~20 mm cubes and placed into glass containers marked with a random code. Descriptive sensory analysis (DSA) was performed by ten trained panellists. A total of five sessions of the DSA were performed, in which four sets of four samples (five sets in the last session) were randomly presented to the panellists. Each set consisted of four samples from a single animal, differing in ageing period length. A linear unstructured continuous 100 mm scale was used for each of the nine descriptors, which was subsequently transformed into a numerical scale (0-100) for the statistical analysis. The MIXED procedure of the SAS was used to statistically evaluate the data. The model included the fixed effect of ageing period and the random effects of session and panellist. The data in table 1. are presented as least squares means and standard errors of the mean (SEM). For *post hoc* analysis, Tukey's range tests were used. Differences were considered significant at the level of  $P < 0.05$ .

### Results

The results of DSA of grilled LL muscles are given in Table 1. With exception of game flavour intensity and liver flavour, significant differences were

observed in all remaining attributes. The samples aged for 14 days received higher and thus more favourable scores for tenderness and overall acceptance than those aged for longer periods ( $P < 0.001$ ). The intensity of game aroma and bitter flavour were scored higher in the samples aged for 28 days compared to those aged for 7 or 14 days ( $P < 0.01$ ). Table 1. Scores (LS mean) for the organoleptic properties of LL muscle from FD following different ageing periods

Attribute	Ageing time				SEM	P-value
	7 days	14 days	21 days	28 days		
Game aroma intensity	54.4 <sup>B</sup>	54.3 <sup>B</sup>	58.0 <sup>AB</sup>	61.4 <sup>A</sup>	2.59	0.002
Liver odour	41.6 <sup>B</sup>	41.2 <sup>B</sup>	46.5 <sup>AB</sup>	49.7 <sup>A</sup>	4.54	<0.001
Tenderness	63.4 <sup>AB</sup>	68.4 <sup>A</sup>	54.4 <sup>C</sup>	61.5 <sup>B</sup>	3.35	<0.001
Juiciness	56.5 <sup>AB</sup>	60.8 <sup>A</sup>	52.6 <sup>B</sup>	56.2 <sup>AB</sup>	3.37	0.016
Game flavour intensity	56.8	61.2	60.0	58.7	3.49	0.119
Liver flavour	51.0	52.7	54.7	54.8	4.00	0.268
Bitter flavour	34.3 <sup>C</sup>	36.3 <sup>BC</sup>	41.0 <sup>AB</sup>	42.8 <sup>A</sup>	5.32	0.001
Chewiness	58.5 <sup>A</sup>	60.2 <sup>A</sup>	45.2 <sup>B</sup>	55.0 <sup>A</sup>	3.92	<0.001
Overall acceptance	57.8 <sup>AB</sup>	61.6 <sup>A</sup>	52.0 <sup>B</sup>	53.4 <sup>B</sup>	2.51	0.001

<sup>A,B,C</sup> Means in a row with different letters differ at  $P < 0.05$

### Conclusion

Higher scores were given for game aroma intensity and liver odour with increasing ageing time which is in agreement with the results reported for hunted FD (Piaskovska et al., 2016). The highest scores for texture characteristics were obtained in the samples that were aged for 14 days, although it did not differ significantly from that obtained from day 7. The highest texture evaluation reported for hunted 3 year old FD was 30 days (Těšanović et al., 2011) whereas for 17 months old FD it was 21 days (Piaskovska et al., 2016). The optimal ageing period for the LL muscle from 20 month old FD bucks in the current study appears to be 14 days, as the additional time did not improve most of the texture characteristic assessed. This is in agreement with the recommendations reported for venison by Farouk et al. (2009). Our results indicate that the effects of age, sex and production system on sensory characteristics of farmed FD meat warrant further research. Acknowledgement: Supported by MZE-RO0718 and CZ.02.2.69/0.0/0.0/16\_027/0008366.

### Notes