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Effect of pelvic suspension on the fresh physical meat quality of male common eland (*Taurotragus oryx*) (#350)

Tersia Needham[1], Daniel Bureš[2, 3], Radim Kotrba[1, 2], Jana Fořtová[2, 3], Nicole Lebedová[4], Louwrens Hoffman[5, 6]

[1] Czech University of Life Sciences, Department of Animal Science and Food Processing, Prague, Czech Republic; [2] Institute of Animal Science, Department of Cattle Breeding, Prague, Czech Republic; [3] Czech University of Life Sciences, Department of Food Science, Prague, Czech Republic; [4] Czech University of Life Sciences, Department of Animal Science, Prague, Czech Republic; [5] Stellenbosch University, Department of Animal Sciences, Stellenbosch, South Africa; [6] University of Queensland, fCentre for Nutrition and Food Sciences, Queensland Alliance for Agriculture and Food Innovation, Coopers Plains, Australia

Introduction

Game species are currently underutilized regarding their meat production potential and despite game meat meeting numerous consumer demands regarding its leanness [1] and the extensive nature of game farming systems [2], little knowledge is currently available into many South African antelope species. Common eland have been identified as favourable for commercial meat production [3]; however, the limited research available on their meat quality has shown that their meat is tough [4]. The objective of this study was thus to determine whether pelvic suspension would improve the fresh meat quality of the various muscles of male eland.

Methods

Ten male eland (~ 2 years) were slaughtered at CULS Research Farm at Lany, using captive bolt stunning, followed by exsanguination and dressing. Carcasses were split along the spine and each side was randomly allocated to either suspension by the pelvic bone, or by the Achilles tendon. After 24 hours at 4 °C, seven muscles were removed from each side, pH (inoLab pH 730, WTW, Weilheim, Germany) was taken and the muscle was cut into ~2cm thick steaks. The first steak was used to measure CIE Lab surface colour after 45min blooming (CM-700d, Minolta, Osaka, Japan), the second for drip loss and the third for cooking loss (75°C internal temperature in 80°C waterbath) [5] and then shear force determination (6 cores/muscle using Warner-Bratzler blade on Instron, Canton, MA, USA) [4]. Data was analysed separately for each muscle, using the GLM procedure in SAS statistical package. Normality and homoscedasticity was tested, and the model included suspension method as fixed effect and the animal as a random effect. LSMeans were computed using t-tests and significant differences are reported at a level of 5%.

Results

Results for the fresh meat quality are presented in Table 1 (see attached). Pelvic suspension decreased the shear force values of the *psoas major* ($P = 0.007$) and *biceps femoris* ($P = 0.002$) muscles. Pelvic-suspended sides had marginally lower *psoas major* pH_{24h} ($P = 0.037$) and the *biceps femoris* muscles had lower drip losses ($P = 0.023$), which likely had a positive effect on its tenderness. *Longissimus lumborum* muscles from pelvic-suspended sides were darker (L*; $P = 0.028$) and had greater b* colour values ($P = 0.003$).

Conclusion

As expected, pelvic suspension did not influence the fresh meat quality of the forequarter muscles, but it increased the tenderness of two high-value muscles: *psoas major* and *biceps femoris*. The colour differences seen in the lumbar region of the *Longissimus* muscle were minor and unlikely to influence consumer evaluation. The tenderness of the *biceps femoris* was greatly improved with pelvic suspension compared to previous studies on South African male eland of similar age (Needham et al., 2019).

Acknowledgements

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Notes

Muscle	Suspension	pH_{24h}	Colour			Drip loss (%)	Cook loss (%)	Shear force (N)
			L*	a*	b*			
Psoas major	Pelvic	5.8	41.1	14.0	13.7	1.1	29.3	43.1
	Achilles	5.9	41.2	13.4	13.4	1.2	29.2	52.9
	SEM	0.01	0.76	0.58	0.33	0.10	0.62	2.30
	P-value	**0.037**	0.939	0.478	0.535	0.404	0.939	**0.007**
Longissimus lumborum	Pelvic	5.8	44.0	10.7	13.6	1.9	30.1	56.7
	Achilles	5.8	41.6	10.2	12.5	2.1	29.2	67.3
	SEM	0.01	0.71	0.51	0.23	0.20	1.21	6.62
	P-value	0.924	**0.028**	0.470	**0.003**	0.637	0.584	0.273
Biceps femoris	Pelvic	5.8	44.2	12.3	13.8	0.9	25.9	57.2
	Achilles	5.9	42.4	12.9	13.8	1.3	28.7	81.4
	SEM	0.03	0.99	0.77	0.35	0.12	2.05	4.76
	P-value	0.192	0.220	0.573	0.939	**0.023**	0.338	**0.002**
Semimembranosus	Pelvic	5.9	39.9	12.9	13.1	1.3	29.3	83.2
	Achilles	5.8	38.6	12.2	12.4	1.5	30.8	94.2
	SEM	0.03	0.77	0.56	0.32	0.23	0.98	5.25
	P-value	0.935	0.248	0.388	0.172	0.548	0.300	0.159
Semitendinosus	Pelvic	5.9	47.4	10.6	15.0	0.8	32.7	80.2
	Achilles	5.9	46.4	10.4	14.5	1.3	32.5	91.1
	SEM	0.02	1.03	0.64	0.35	0.15	1.36	4.88
	P-value	0.939	0.492	0.822	0.305	0.074	0.951	0.132
Infraspinatus	Pelvic	5.9	39.0	15.0	13.0	1.0	25.3	61.9
	Achilles	5.9	39.1	14.8	13.2	1.0	26.1	68.3
	SEM	0.02	0.74	0.49	0.36	0.18	1.49	3.64
	P-value	0.475	0.912	0.830	0.827	0.850	0.717	0.232
Supraspinatus	Pelvic	5.9	38.0	16.1	13.4	1.1	32.0	62.9
	Achilles	5.9	37.6	15.5	13.0	0.9	32.7	71.4
	SEM	0.02	0.72	0.66	0.30	0.12	1.87	4.97
	P-value	0.389	0.685	0.521	0.286	0.202	0.802	0.244

Table 1.
The effect of pelvic suspension on the meat quality of seven muscles of male common eland.

Notes