P-10-20

Sensory proprieties of Sahraoui dromedary meat and relationship with quality traits, myofibrillar and sarcoplasmic proteins (#554)

Hanane Smili[1, 2], Samira Becila[1], Radjeb Ayad[2], Antonella della Malva[3], Marzia Albenzio[3], Agostino Sevi[3], Abdelkader Adamou[2], Abdelghani Boudjellal[1], Rosaria Marino[3]

[1] Equipe Maquav, Laboratoire bioqual, INATAA, University Frères Mentouri, Constantine, Algeria; [2] Laboratoire des Bioressources Sahariennes préservation et valorisation, University Kasdi Merbah, Ouargla, Algeria; [3] Dipartimento di scienze Agrarie degli Alimenti e dell'Ambiente, University of Foggia, Foggia, Italy

Introduction

The dromedary is a potentially important food resource in Algeria, although it is an unconventional meat in many other countries. It was estimated at 379 094 head in 2016, with an increasing slaughter volume reaching 40 000 head (FAOstat, 2017). The production of dromedary meat is characterized by a regional aspect with less consumption interest. However, a depth knowledge of meat quality is a crucial element for promoting the consumption of dromedary meat or for better valorisation. The present study aimed to identify the possible biomarkers of sensorial quality of dromedary meat.

Methods

Six young male (2 years ± 0.9 SD) and six adult (9 years ± 1.5 SD) Sahraoui dromedaries, slaughtered according to the Algerian procedure in the commercial slaughterhouse of Ouargla region, were used for meat sampling. *Longissimus Lumbrorum* muscles were excised after 3h *postmortem* from the last two lumbar vertebra and were used to investigate the changes on meat quality parameters at 6 and 24 h *postmortem*.pH and myofibrillar fragmentation index (MFI) were determined according to Bendall (1973) and Culler et al. (1978), respectively. Determination of myofibrillar and sarcoplasmic proteins using SDS PAGE was conducted according to Marino et al., (2013). The sensory properties were evaluated, on muscle pieces (3 cm long, 1.5 cm thick and 2 cm wide) cooked in water bath during 45 min to an internal temperature of 80 °C, by a panel of 12 assessors, previously trained to develop a commune sensory vocabulary and to evaluate the intensity of the following attributes: tenderness, juiciness, flavour, abnormal flavour, cohesion, chewiness, presence of residues and overall appreciation. Data were subjected to analysis of variance using the GLM procedure of the SAS statistical software with age, ageing time and their interaction as fixed effect. Correlations were calculated using Pearson coefficient with the CORR procedure of SAS and significant correlation was assumed where $p < 0.05$.

Results

As shown in table 1, the sensorial evaluation of dromedary meat revealed a significant effect of age on tenderness, juiciness and overall liking, particularly young dromedaries showed more tender and juicy meat than old dromedaries, with the highest values of overall liking. Tenderness was negatively correlated to cohesion and chewiness (r=-0.35; *P<0.05* and r=-0.46; *P<0.001* respectively), and positively correlated to juiciness and overall liking (r=0.44; *P<0.01* and r=0.52; *P<0.001* respectively) while flavour was positively correlated to the overall liking (r=0.47; *P<0.001).* A significant effect of ageing time was found for pH with higher value at 6 hour than at 24 hour as shown in table 2. On the contrary MFI was significantly affected by age with the highest values in young animals both at 6 and 24 hours (table 2).

The relative abundance of many myofibrillar and sarcoplasmic proteins separated on SDS PAGE were affected by age and ageing time (data not shown). The relationships between sensory proprieties, meat quality traits, myofibrillar and sarcoplasmic proteins were summarized in Table 3. pH was positively correlated to flavour, while, MFI at 6 and 24h was positively correlated to tenderness and juiciness parameters. Refers to myofibrillar proteins, Troponin T and I showed negative correlations with tenderness, flavour and overall liking. The polypeptides of the sarcoplasmic fraction and aldolase (ALD) showed negatives correlations with tenderness and overall liking, while, lactate dehydrogenase (LDH), phosphoglycerate mutase (PGAM) and creatine kinase (CK) were positively correlated to tenderness, overall liking and juiciness or flavour.

Conclusion

Previous studies reported a controversial effect of pH on meat odour and flavour, in the present study the low acidification of the muscle could be due to a greater protein degradation that lead to the development of more appreciated flavour. The negative correlation between tenderness, overall liking, Troponin T and I highlight the key role of these proteins in meat tenderization also in dromedary meat. On the contrary the relationship between glycolytic enzymes and sensorial parameters emphasize that sarcoplasmic proteins could have an impact on meat quality. The results of the present study indicated that age had a significant effect on sensory proprieties of dromedary meat. In addition, some proteolysis biomarkers that could be suitable for a better valorisation of the product were highlighted.

References

Bendall J. R., 1973, *Postmortem* changes in muscle, In Bourne G.H. (Ed) The structure and function of muscle (p. 243-309). New York Academic press, Inc. Culler R. D., Parrish F. C. Jr., Smith G. C. & Cross H. R., 1978, Relationship

Notes

of myofibril fragmentation index to certain chemical physical and sensory characteristics of bovine longissimus muscle, *Journal of Food Science*, 43, 1177-1180.

Marino R., Albenzio M., della Malva A., Santillo A., Loizzo P. & Sevi A., 2013, Proteolytic pattern of myofibrillar protein and meat tenderness as affected by breed and aging time, *Meat Science*, 95, 281-287.

	Tenderness	Juiceness	Flavour	Overall liking
Meat quality traits				
pH 6H			0.30*	
MFI 6h	0.38**	0.30*		
MFI 24h	0.49***	0.30*		
Myofibrillar proteins				
Actin 6h		-0.98***	-0.83*	-0.90*
TnT 6h	-0.86*			-0.82*
TnI 6h	-0.94**	-0.93**	-0.86*	-0.97**
TnI 24h	-0.99***		-0.82*	-0.95**
Sarcoplasmic proteins				
86-70 kDa 6h	-0.95**	-0.85*		-0.92**
62-59 kDa 24h	-0.89*	-0.96**	-0.88*	-0.97**
PGI 6h		0.81*	0.98**	0.89*
CK 24h	0,97*		0.91*	0.89*
ALD 24h	-0.98***	-0.84*		-0.94**
LDH 6h	0.83*	0.96**	0.83*	0.93**
PGAM 24h	0.99***	0.81*		0.95**
26-16 kDa 24h	0.96**	0.86*	0.92**	0.98***

Table 3. Correlations between sensory proprieties, meat quality traits and proteomic analysis
Significance α=0.05; *= P<0.05; **=P<0.01; ***=P<0.001

Notes

	Age	Ageing (h)		SEM	Effects,P		
		6	24		Age	Ageing	Age x Ageing
pH	Old	6.32a	5.87b	0.05	NS	***	NS
	Young	6.43a	5.99b				
MFI	Old	65.85B	70.28B	5.23	***	NS	NS
	Young	97.89A	101.45A				

Table 2. Age and ageing time effects on dromedary meat quality proprieties
NS = not significant; *= P<0.05; **=P<0.01; ***=P<0.001. a, b = P< 0.05 in the row (ageing effect). A, B = P<0.05 in the column (age effect).

	Age		SEM	Effect P
	Old	Young		
Tenderness	3.40	6.03	0.19	***
Juiceness	2.97	4.62	0.22	***
Flavour	4.14	4.24	0.20	NS
Abnormal flavour	1.30	1.02	0.14	NS
Cohesion	4.74	3.88	0.20	*
Chewiness	5.57	3.77	0.20	***
Presence of residue	2.51	2.43	0.16	NS
Overall liking	4.16	5.80	0.18	***

Table 1. Sensory Proprieties of Longissimus Lumborum muscle of dromedary as affected by age.
NS = not significant; *= P<0.05; **=P<0.01; ***=P<0.001.

Notes