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Meat quality traits of indigenous lambs and goat kids from extensive production system

Ivan Vnučec[1], Zvonimir Prpić[1*], Zvonko Antunović[2], Boro Mioč[1]

[1] University of Zagreb, Faculty of Agriculture, Svetošimunska 25, 10000 Zagreb, Croatia

[2] Josip Juraj Strossmayer University of Osijek, Faculty of Agrobiotechnical Sciences, Vladimira Preloga 1, 31000 Osijek, Croatia

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The aim of this study was to compare the quality traits of meat of Dalmatian Pramenka lambs and Croatian Spotted goat kids, both Croatian indigenous breeds. For that purpose, fifteen single-born male lambs and fifteen single-born male goat kids were raised under identical dietary regime in extensive lamb/goat kid production system typical for the Mediterranean basin. Lambs and goat kids were fasted for 24 h and slaughtered at average 22.70±0.35 kg and 23.47±0.52 kg live weight, respectively, corresponding to degree of maturity of approximately 51%. Meat colour was determined on the surface of the cut section of the *Longissimus dorsi* muscle (LD). Samples of LD and kidney knob fat were excised from the left side of the carcasses to determine proximate composition, mineral composition, and fatty acids profile. The L* and a* colour parameters of LD were of similar values in both species, but the b* value was significantly higher in lambs (8.88) than in goat kids (3.49). Lambs accumulated more fat (2.93% vs. 1.85%) and ash (1.19% vs. 1.12%), but less protein (20.37% vs. 21.57%) than goat kids. The potassium, sodium and magnesium contents in lamb LD were higher than in kid LD. Goat kids had higher content of all analysed trace elements than lambs, except copper. Due to the higher intramuscular fat content and thus higher monounsaturated fatty acids content, lamb meat had more favourable fatty acid profile than goat kid meat, but goat kids displayed a lower n-6/n-3 ratio (1.52) compared to lambs (2.26).

KEY WORDS: chemical composition / fatty acid / goat kids'/ lamb / meat / mineral composition

Sheep and goats are the dominant species of domestic animals in the Croatian coastal area, as is most common in the Mediterranean countries. Lamb and kid carcasses, most often consumed after spit roasting, are typical product of sheep and goats in

*Corresponding authors: zprpic@agr.hr

Croatia. The Dalmatian Pramenka and Croatian Spotted Goat are the predominant breeds of indigenous sheep and goats, mainly bred in the area of Dalmatian hinterland in the sub-Mediterranean part of Croatia. The most important characteristics of these breeds are resistance and stamina, then agility and ingenuity in moving and grazing in steep and inaccessible areas [Prpić *et al.* 2010]. Generally, in the above mentioned traditional grazing area the sheep and goats are mainly farmed under extensive or semi-extensive management based on natural pastures [Vnučec 2011]. The above mentioned sheep and goats are typical dual-purpose breeds, developed to produce the unweaned slaughter lambs and goat kids at an early age. As occurs in most of the Mediterranean countries, the light carcasses of lambs and goat kids (10 – 13 kg at 2.5 – 4 months of age) that are the most common for spit roasting to feed a large group of people on high days and holidays are typical product of sheep and goats in Croatia [Vnučec 2011]. Typical products, by their history, originality and ”natural image” have a good reputation by consumers, who are more and more concerned about food origin [Santos-Silva *et al.* 2002].

The relevance and high edible quality of light lamb carcasses produced in European countries of the Mediterranean region have been studied by many authors [Sañudo *et al.* 2007, Juárez *et al.* 2009]. However, to our knowledge, information on quality traits of light lamb's meat derived from indigenous Croatian sheep breeds could not be found to date. Similarly, knowledge of meat quality of indigenous goats is limited due to the traditionally low economic significance of such animals in developed countries [Tshabalala *et al.* 2003]. These may be the reasons for low consumption of lamb meat (about 2 kg per capita per annum) and especially goat kid meat (bellow 1 kg per capita per annum) in Croatia. So it is important to obtain information about primary meat quality differences between these two species in order to help consumers make decision in purchasing meat. Therefore, the aim of this study was to compare chemical composition and some quality parameters of meat from lambs and goat kids traditionally grown on natural pastures in the sub-Mediterranean part of Croatia and slaughtered at similar degree of maturity.

Material and methods

Fifteen single-born male lambs of the Dalmatian Pramenka breed and fifteen single-born male goat kids of the Croatian Spotted Goat breed born during the spring (March) and reared on natural rangelands with their dams in a typical sub-Mediterranean area of small ruminant production were used for this study. The experimental animals were obtained from the same farm situated in Dalmatian Zagora, south-west Croatia (43°49′52″N 16°34′55″E, 450 m above sea level). The experimental site is characterized by rocky ground and stone, poor vegetation, thicket and underbrush, and hot, dry summers and windy winters. The total amount of precipitation and average temperatures during the study period were 75.8 mm and 8.2°C (March), 88.4 mm and 12.1°C (April), 86.9 mm and 16.7°C (May), 85.0 mm and 20.5°C (June), respectively (data obtained from the Croatian Meteorological and Hydrological Service Institute).

Experimental lambs and goat kids were raised traditionally, suckling milk from their dams, not being weaned until slaughter at 3.5-4 months of age. There was no concentrate supplementation provided for experimental flock during the course of the experiment. Lambs and goat kids were slaughtered at average 22.70±0.35 kg and 23.47±0.52 kg live weight, respectively, corresponding to the maturity degree of approximately 51%. The degree of maturity was calculated as follows: slaughter weight of lamb (kid)/average body weight of adult rams (bucks) x 100. Adult weights of rams and bucks were previously published by Širić *et al.* [2009] and Mioč *et al.* [2008], respectively.

Slaughtering was performed in local abattoir by the classic method for lambs and goat kids, which includes bloodletting by parallel cutting of major neck blood vessels (*V. jugularis externa* and *A. carotis communis*), removal of skin together with lower parts of legs (distal to carpal and tarsal joints), extraction of offal (gastrointestinal tract with content, liver, lungs, heart and spleen). The head was not separated and remained a part of the carcass. No electrical stimulation was applied.

Immediately after 30 min. blooming, instrumental colour CIE L^* (lightness), a^* (redness) and b^* (yellowness) [CIE, 1986] readings were determined on the surface of the cut section of the *Longissimus dorsi* (LD) muscle at the 13th rib using a spectrophotometer (Minolta Chroma Meter CR-410, Germany). The LD muscle and kidney knob fat samples were taken from the 12th to 13th rib for analyses of chemical composition, mineral composition, and determination of fatty acid (FA) profiles. The LD muscle and kidney knob fat samples were packed in plastic bags and frozen at -20°C until the analyses were performed.

Procedures described by AOAC [1999] were used to determine dry matter (DM, method ID 950.46), ash (method ID 920.153), Kjeldahl N (CP, method ID 981.10) and crude fat content (method ID 960.39) of the *Longissimus* muscle samples.

A wet ashing method was used to prepare the meat samples for determination of the elements potassium (K), phosphorus (P), sodium (Na), magnesium (Mg), calcium (Ca), zinc (Zn), iron (Fe), copper (Cu) and manganese (Mn). The selenium (Se) content was released by acidic digestion of the sample and then converted into Se(IV) which reacted with 2,3-diaminonaphtalene to form a so-called piazselenol derivative which is fluorescently active and can be fluorometrically measured. All the components with the exception of selenium and phosphorus were measured by flame atomic absorption spectrophotometry (Na, K with emission) using Unicam Solaar M6 Atomic Absorption Spectrophotometer. Phosphorus and selenium were measured by spectrophotometry and fluorometry, respectively.

A sample quantity containing approximately 0.5-1.0 g fat was destructed with 8-20 cm^3 of hydrochloric acid (37%) for 1 hour on hot water bath to extract the lipids. After having cooled down, 7 cm^3 of ethanol was added. Lipids were extracted with 15 cm^3 diethylether and 15 cm^3 benzine (b.p. <60°C), and the organic layers were combined.

From a portion of this solution, containing approx. 150-200 mg fat, the solvents were removed at 80°C under reduced pressure (a complete evaporation not necessary). To the residue 4 cm^3 of 0.5 M sodium hydroxide methanol solution was added and boiled until all the fat drops disappeared (approx. 5 min), then 4 cm^3 of 14% boron trifluoride methanol solution was added, boiled for 3 min, finally 4 cm^3 of hexane dried on water-free sodium sulphate was added and boiled for 1 min, and the mixture was allowed to cool down. Saturated aqueous sodium chloride solution was added and after having separated the organic layer was collected into a 4 cm^3 vial containing water-free sodium sulphate and directly examined by gas chromatography. Methyl esters were analysed on a Chrompack CP 9000 gas chromatograph (Middleburg, The Netherlands) equipped with a flame ionization detector (FID) and fitted with a CS-Sil 88 capillary column (100 m x 0.25 mm) using helium as a carrier gas. The oven temperature was programmed at 140°C for 10 min, increased from 140 to 235°C at a rate of 10°C/min followed by isotherm for 26 min.

Data were analysed using the least squares method of the GLM procedure of SAS [2009], fitting a one-way model with a fixed effect of species. The least square means (LSM) and their standard errors (SE) are presented in Tables 1-4. A probability of $p \leq 0.05$ values was considered statistically significant.

Results and discussion

The colour of meat is one of the main factors of subjective visual assessment of carcass and fresh meat quality, especially in light lamb and goat kid production, which colour estimates should be within the range of light pink meats (L^* >45 and a^* between 15 and 18; Sañudo *et al.*, 1992). The L^*, a^*, b^* colour parameters of the fresh LD muscle are presented in Table 1.

Table 1. Colour parameters of LD muscle from lambs and goat kids (n=15/species)

Parameter	Lambs*	Goat kids*	SE
L^* value	50.27	48.95	0.63
a^* value	18.71	19.47	0.48
b^* value	8.88^A	3.49^B	0.33

^{AB}Within a row, means with bearing different superscripts differ significantly at $p<0.01$.
*Least Square Means. SE – standard error for both species; LD – *Longissimus dorsi* muscle.

The observed lightness (L^*) values (48.95 for goat kids and 50.27 for lambs) are indicative of pink meats. This result confirmed the conclusion of other authors [Sheridan *et al.* 2003, Lee *et al.* 2008] that the lightness of analysed muscle has not been influenced by species. The redness (a^* value) of LD muscle in the present study was not significantly ($p>0.05$) different between studied species. Santos *et al.* [2008] also observed similar trend when lightness and redness of *Longissimus* muscle from suckling lambs and goat kids were measured. However, Babiker *et al.* [1990] stated that goat kids' meat tends to be darker red in colour than lambs' meat because of lower intramuscular fat content. In this study, only the b* value significantly ($p<0.01$) differed between the experimental groups, being higher in lambs (8.88) than in goat kids (3.49).

Significant differences were found for protein ($p<0.01$), fat and ash contents ($p<0.05$) in the LD of lambs and kids (Tab. 2). The higher protein ($p<0.01$) and lower fat content ($p<0.05$) in the kid meat comply with the findings of Tshabalala *et al.* [2003] and Mushi *et al.* [2008]. In general, goats, unlike sheep, deposit less fat in the carcass and more in the viscera and so goat meat has less intramuscular fat than lamb [Babiker *et al.* 1990]. In our study, the lamb meat had more ash than kid, but in previous studies comparing ash content in meat from those two species the results were very confronting [Lee *et al.* 2008, Mushi *et al.* 2008].

Lamb muscle samples in the present study contained considerably more fat and consequently had higher dry matter content than LD muscle from lambs of Pramenka breed (1.54% fat and 22.95% dry matter) studied by Mioč *et al.* [2007]. Similarly, Croatian Spotted Goat kid meat contained rather more fat and protein than that of Saanen and Alpine kids slaughtered at 70 days of age [Mioč *et al.* 2001].

Table 2. Proximate composition (% wet weight basis) of LD samples from lambs and goat kids (n=15/species)

Component (%)	Lambs*	Goat kids*	SE
Dry matter	24.72	24.67	0.22
Protein	20.37^{B}	21.57^{A}	0.08
Fat	2.93^{a}	1.85^{b}	0.23
Ash	1.19^{a}	1.12^{b}	0.01

$^{aA...}$Within a row, means with bearing different superscripts differ significantly at: small letters – $p<0.01$; capitals – $p<0.01$.
*Least Square Means. SE – standard error for both species; LD – *Longissimus dorsi* muscle.

Mineral and trace element concentrations in animal muscles can affect meat quality. Lamb and goat kid meat, similar to other red meats, are rich sources of various minerals that are more readily available for humans than those of non-animal origin. Significant differences for all mineral contents in meat, except phosphorus, were determined between studied species (Tab. 3).

Since the experimental animals in our study were selected from a single geographical location, feeding regimen and the same age group, variation in mineral composition can be explained as an effect of the animal species. The most abundant minerals in lamb and goat kid meat were K, P and Na, which is in accordance with previous publications on mineral content in ovine [Miguélez *et al.* 2008] and caprine meat [Beserra *et al.* 2000]. The lamb meat had higher K, Na and Mg concentrations than goat kid meat, which is opposite to findings reported by Sheridan *et al.* [2003].

Table 3. Mineral composition (mg/100 g meat sample) of LD from lambs and goat kids (n=15/species)

Mineral	Lambs*	Goat kids*	SE
K	337.26^{a}	319.44^{b}	4.74
P	191.17	196.75	3.07
Na	57.39^{a}	53.11^{b}	1.39
Mg	22.73^{A}	16.95^{B}	0.24
Ca	2.23^{B}	3.81^{A}	0.07
Zn	1.89^{A}	2.75^{B}	0.05
Fe	0.189^{A}	0.274^{B}	0.005
Cu	0.130^{A}	0.028^{B}	0.004
Mn	0.010^{B}	0.013^{A}	0.001
Se	0.019^{B}	0.027^{A}	0.001

$^{aA...}$Within a row, means with bearing different superscripts differ significantly at: small letters – p<0.01; capitals – p<0.01.
*Least Square Means. SE – standard error for both species; LD – *Longissimus dorsi* muscle.

Zinc was the most abundant trace element in both studied species, and goat kids had almost equal content of this mineral as the Alpine kids in the same muscle [Mioč *et al.* 2000]. Sodium, Ca, Zn and Mn contents in the lamb LD were considerably lower than values reported for edible portion of loin chop of Australian lambs [Hoke *et al.* 1999]. However, it should be noted that reports from various studies vary greatly in values of minerals in ovine and caprine meats. This may be due to various factors including different genotype, age and body weight of animals at slaughter, diet, anatomical position of sampled muscles, sampling method and method of analysis.

Average values and standard errors for intramuscular (LD) and kidney knob fatty acid composition are presented in Table 4. The major fatty acids were palmitic (C16:0), stearic (C18:0) and oleic (C18:1 n-9) which accounted for 71.44 and 72.77% of the total fatty acids in from lambs and goat kids, respectively. These three major fatty acids also dominated in lamb and kid kidney knob fat (82.05% and 80.09%, respectively).

The major saturated fatty acids (SFA) within lamb and goat kid meat in the present study were myristic (C14:0), palmitic (C16:0) and stearic (C18:0) acids. Generally, the lauric (C12:0), miristic (C14:0) and palmitic (C16:0) acid have each been found to be significantly associated with raising levels of LDL cholesterol in the blood [Grundy and Denke 1990], while stearic (C18:0) and short chained (C6:0–C10:0) fatty acids have been found to have neutral cholesterol-raising effects in humans [Mensink *et al.* 2003]. Muscle samples from lambs in our study contained less ($p<0.05$) SFA than those from goat kids. Similarly, the goats contained proportionally more SFA than indigenous Damara sheep in South Africa [Tshabalala *et al.* 2003]. Dalmatian Pramenka lamb meat had lower ($p<0.05$) concentration of palmitic acid (C16:0) than

Croatian Spotted Goat kid meat which is in close agreement with the findings of Lee *et al.* [2008]. However, the LD of both species contained similar amounts of lauric (C12:0) and miristic (C14:0) acid. Banskalieva *et al.* [2000] reported that the average percentage of stearic acid in goat kid muscles is similar to that of other ruminant species, particularly sheep, which is in agreement with our findings.

Table 4. Fatty acid composition (weight% of fatty acid methyl esters) of intramuscular (*Longissimus* muscle) and kidney knob fat samples from lambs and goat kids (n=15/species)

Fatty acid	Intramuscular (LD)			Kidney knob fat		
	lambs*	goat kids*	SE	lambs*	goat kids*	SE
C10:0	0.19	0.20	0.01	0.54^{b}	0.83^{a}	0.07
C12:0	0.46	0.47	0.02	0.88^{B}	1.12^{A}	0.04
C13:0	0.04	0.03	0.01	0.06	0.07	0.01
C14:0	4.97	4.87	0.18	7.92^{B}	9.54^{A}	0.26
C14:1	0.26	0.24	0.04	0.13	0.11	0.01
C15:0	0.61^{a}	0.54^{b}	0.02	0.89	0.96	0.03
C16:0	22.14^{b}	23.69^{a}	0.44	23.16^{B}	30.96^{A}	0.49
C16:1	1.54^{B}	2.54^{A}	0.09	1.06^{B}	1.54^{A}	0.05
C17:0	1.06	1.04	0.02	1.44	1.46	0.04
C17:1	0.57^{b}	0.66^{a}	0.02	-	-	-
C18:0	16.09	17.14	0.54	24.02	24.01	0.79
C18:1 trans 11	4.02^{A}	1.74^{B}	0.10	-	-	-
C18:1 cis 9	33.21	31.94	0.76	34.87^{A}	25.93^{B}	0.63
C18:2 n-6	5.72^{A}	3.93^{B}	0.28	1.79^{A}	1.31^{B}	0.05
C18:2c9,t11	1.29^{A}	0.55^{B}	0.08	1.19^{A}	0.54^{B}	0.04
C18:3 n-3	1.73	1.71	0.08	0.86	0.95	0.05
C18:3 n-6	0.11^{A}	0.02^{B}	0.01	-	-	-
C20:0	0.37^{A}	0.14^{B}	0.01	0.56^{A}	0.25^{B}	0.02
C20:1	0.14^{a}	0.11^{b}	0.01	0.13^{A}	0.06^{B}	0.01
C20:2	0.09^{A}	0.04^{B}	0.01	0.05^{A}	0.02^{B}	0.01
C20:3 n-3	0.10^{A}	0.05^{B}	0.01	0.04	-	0.01
C20:3 n-6	0.22^{B}	0.35^{A}	0.02	-	-	-
C20:4 n-6	2.31	2.28	0.20	0.03	0.05	0.01
C20:5 n-3	0.63	0.85	0.09	-	-	-
C22:0	0.19^{B}	0.33^{A}	0.02	0.14^{a}	0.10^{b}	0.01
C22:5 n-3	0.95^{B}	1.36^{A}	0.08	-	0.20	0.01
C22:6 n-3	0.29	0.36	0.03	-	-	-
C23:0	0.04^{B}	0.23^{A}	0.01	-	-	-
C24:0	0.13^{B}	0.26^{A}	0.02	-	-	-
SFA	46.29^{b}	48.96^{a}	0.77	59.80^{B}	69.39^{A}	0.74
MUFA	39.74^{a}	37.23^{b}	0.85	36.19^{A}	27.64^{B}	0.65
PUFA	13.44	11.50	0.68	2.76	3.05	0.11
PUFA/SFA	0.29^{a}	0.24^{b}	0.02	0.05	0.04	0.01
n-6	8.36^{a}	6.58^{b}	0.49	1.87^{A}	1.37^{B}	0.05
n-3	3.70^{A}	4.33^{B}	0.20	0.90^{B}	1.14^{A}	0.05
n-6/n-3 ratio	2.26^{A}	1.52^{B}	0.06	2.10^{A}	1.22^{B}	0.05

[aA...]Within a row, means with bearing different superscripts differ significantly at: small letters – p<0.01; capitals – p<0.01.

*Least Square Means. SE – standard error for both species. SFA – saturated fatty acids; MUFA – monounsaturated fatty acids; PUFA – polyunsaturated fatty acids.

There was a higher content of monounsaturated fatty acids (MUFA) than polyunsaturated fatty acids (PUFA) in both species. Monounsaturated fatty acids tended to be higher in lamb meat compared to goat kid meat ($p<0.05$). The concentration of palmitoleic (C16:1) acid was higher ($p<0.01$) in kid LD than in lamb LD; however, the mean concentration of the most abundant unsaturated fatty acid (oleic, C18:1 cis 9) was similar ($p>0.05$) in both species. These results are in accordance with previous studies [Banskalieva *et al.* 2000, Mushi *et al.* 2008]. Within PUFA, the concentration of linoleic (C18:2 n-6) acid was higher ($p<0.01$) in Dalmatian Pramenka lamb muscle, but the concentration of another essential fatty acid, linolenic (C18:3 n-3), was similar in both species. Besides essential fatty acids, ruminants also naturally produce conjugated linoleic acids (CLAs) which have beneficial impact on human health [Woods and Fearon 2009]. In our study, lamb muscle lipids contained more than twice as much conjugated linoleic (C18:2 c9, t11) acid than those of goat kids. Mir *et al.* [2000] also found that lamb meat lipids have significantly higher content of CLA isomers compared with other ruminant meat lipids. In general, the long chain PUFA concentrations were very variable between lamb and goat kid LD muscle in this study. This may result from a difference in the specificity for incorporation of fatty acids into phospholipids.

Although goat kid meat was leaner than lamb, this study showed that meat of both species does not contain desirable proportions of SFA and PUFA. According to Wood *et al.* [2003] the PUFA/SFA ratio should be within the range ≥0.45-4.0 and n-6/n-3 PUFA ratio should be lower than 4 to help reducing risk of suffering coronary diseases to consumers. In fact, it is well known that the amount of fat in the human diet and especially the proportion of saturated FA have been considered as major risk factors of coronary heart diseases. Also, the lower SFA, together with the higher MUFA concentrations in meat is desirable for human health [Wood *et al.* 2003]. In this respect, meat from the Dalmatian Pramenka lambs with PUFA/SFA ratio of 0.29 could be considered slightly healthier than that of Croatian Spotted Goat kids with PUFA/SFA ratio of 0.24 ($p<0.05$).

The n-6/n-3 ratios in the present study (1.52-2.26) were within the recommended range for the human health of less than 4. Opposite to the findings of Mushi *et al.* [2008], n-6/n-3 ratio was significantly ($p<0.01$) lower in goat kid than in lamb meat. The observed higher concentration of n-6 fatty acids in lamb meat than in goat kid meat may suggest species difference in fat metabolism. However, caution should be exercised in this comparison since lamb meat contained considerably less linoleic (C18:2 n-6) acid which resulted in lower proportion of the n-6 PUFA in goat kid meat than in lamb meat.

Considering the fact that kidney knob fat is traditionally an integral part of lamb and goat kid carcasses prepared for spit-roasting, the fatty acid composition of this adipose depot significantly contributes to the nutritional value of the whole carcass. The anatomical location of adipose tissues is the main factor affecting the fatty acid composition of ruminant adipose deposits. The fat of the internal, omental, mesenteric, perirenal and pelvic depots is more saturated than the subcutaneous and intramuscular depots [Morand-Fehr *et al.* 2011]. Hence, incorporation of SFA in kidney knob lipids was higher than in muscle tissue of lambs and goat kids studied, while the proportion of long-chain PUFA was lower than in muscle lipids (Tab. 4). These results are in close agreement with previously published data [Woods and Fearon 2009]. It is known that the amount of long chain PUFA deposited in adipose tissue triglycerides is very small compared to the proportion of C20-22 PUFA in the phospholipids of cell membranes [Wood *et al.* 2003]. Therefore, the PUFA/SFA ratio in the kidney knob fat was considerably lower than in the muscle tissue of animals studied. However, it is interesting to note that the kidney knob fat from goat kids contained less n-6 and more n-3 fatty acids than that of lambs ($p<0.01$). Consequently, goat kids' adipose tissue had slightly lower n-6/n-3 ratio in relation to the muscle tissue.

In the present study, the goat kids' kidney knob fat contained higher concentration of SFA ($p<0.01$) than that of lamb. Compared to lambs, goat kids had higher concentrations of capric (C10:0; $p<0.05$), lauric (C12:0), myristic (C14:0) and palmitic acids (C16:0; $p<0.01$) in the kidney knob fat, but a lower percentage of arachidic (C20:0; $p<0.01$) and behenic acids (C22:0; $p<0.05$). Due to a significantly higher ($p<0.01$) percentage of oleic (C18:1 cis 9) acid, lamb adipose tissue had higher total MUFA ($p<0.01$) than that of goat kids. However, data on the fatty acid composition of kidney knob fat in lamb and kid carcass have been limited because of its relatively low commercial importance [Wood *et al.* 2003, Dubeuf *et al.* 2004].

The present study shows that LD samples of Dalmatian Pramenka and Croatian Spotted Goat kids are of similar visual appearance and are indicative of pink meats. However, there was a tendency of lamb meat to have a higher b^* value than kid meat. Goat kids had leaner meat with more proteins and less ash than lambs. Although lamb muscle was significantly richer in three of the most abundant minerals (K, Na and Mg), total mineral content was quite similar between studied species. On the contrary, goat kids had significantly higher content of all analysed trace elements than lambs, except copper. FA composition of muscle lipids and kidney knob fat were highly variable.

According to the results of the study, both lamb and goat kid meat can be equally recommended for consumption. The criteria for choosing between these types of meat could depend on consumers' preferences or their health status. For example, due to higher fat content, lamb meat is juicier than goat kid meat, and therefore more acceptable to the group of consumers to whom the organoleptic characteristics of food are more important than health recommendations for the consumption of foods with lower fat content. In contrast, taking into account the higher protein and trace elements contents, and better n-6/n-3 ratio, goat kid meat is, compared to lamb, advisable to consumers of a more sensitive health status (children, elderly, cardiovascular patients, convalescents...).

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