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Alterations in some clinical biochemistry values of Honamlı and Native Hair goats during pubertal development

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ABSTRACT

Honamlı goats have been defined and recorded as a new breed but the literature is very limited on these goats. In terms of meat production, they have been reported as having some of the highest potential among the goat breeds in Turkey. The aim of the present study was to determine the alterations in blood serum chemistry values in the puberty period in Honamlı and Native Hair goats. Selected biochemistry parameters were chosen due to their association with meat production potential. Blood samples of Honamlı (n = 90, 45 animals for each sex) and Native Hair goats (n = 90, 45 animals for each sex) were obtained from goat herds in the Western Mediterranean region of Turkey. The values of alkaline phosphatase (ALP), alanine transaminase (ALT), aspartate transaminase (AST), creatine kinase (CK), calcium, cholesterol, creatinine, iron, magnesium, phosphorus, total lipids, triglycerides and uric acid were measured in the sera obtained from blood samples of males and females in equal numbers of each species, in the three age groups of 4, 8 and 12 months. One-way analysis of variance and the Tukey test were performed for statistical evaluation. In both male and female animals, ALT, AST, CK, calcium, cholesterol, creatinine, iron, magnesium, phosphorus, total lipids, triglycerides and uric acid levels exhibited significant ($P<0.05$) differences between the age groups. Our findings suggest that there are age-associated parallel increases of ALT values in female goats and total lipid values in male goats. The present study also reveals that the analyzed biochemical values usually change after 4 months of age when compared with the other age groups.

Key words: Honamlı, Native Hair goats, blood biochemistry

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Introduction

Until recent years, Honamlı goats were evaluated within the Native Hair goat breed, but they have been registered as a separate breed owing to their different morphology and yield properties. They are raised by Yörüks, for milk and meat, on the slopes of the Taurus Mountains in the Western Mediterranean region of Turkey. The number of research studies carried out on these herds is quite low due to the nomadic lifestyle of the Yörüks (ERDURAN and KIRBAŞ, 2010). Honamlı goats have one of the highest potentials for meat production of goat breeds in Turkey (ELMAZ et al., 2012a; ELMAZ et al., 2012b).

Determination of blood biochemistry values provides information on normal levels for the breed and assists clinicians to confirm clinical diagnosis and appropriate treatment (PICCIONE et al., 2010; PICCIONE et al., 2014). In this context, the levels of some selected clinical biochemical parameters of the goat breeds sampled in the present study could serve as valuable data for performing new scientific studies in the future.

Honamlı and Native Hair goats are widely raised in the same region of Turkey. To the best of the authors' knowledge, no studies on blood biochemical parameters in Honamlı goats have been reported in literature. Therefore, the aim of this study was to assess selected hemato-chemical parameters of Honamlı and Native Hair goats during pubertal development.

Materials and methods

Study design and sampling. The experimental procedures were approved by Mehmet Akif Ersoy University, Ethics Committee (21.11.2012, meeting/decision: 3/09). One hundred and eighty goats reared in the Teke region were sampled. Blood samples of Honamlı (n = 90) and Native Hair (n = 90) goats were obtained from herds in Korkuteli and Kaş districts of Antalya. Twelve groups were formed in the study and each group included 15 goats.

The flocks were pastured on open range fields and forests from early in the morning until noon. In general, this district is poor in terms of the quantity and quality of pasture. Kids suckled in the morning and at night. When the kids were 2 months old they started to go out to pasture with their dams. The kids' weaning age was 120 days old.

The beginning and the end of the puberty period (KHANUM et al., 2000; ÖZDER, 2006) were considered in the creation of age groups. Healthy animals were enrolled and included in the study following clinical examination. Blood serum samples were collected at 4 (summer), 8 (autumn) and 12 (winter) months of age. For sampling purposes, vacuum blood collection tubes (BD Vacutainer 367953, 8.5 mL and 5-7 mL) were used, 2 tubes of blood samples were taken from the jugular veins of the animals of both breeds and sexes. Sera were obtained from centrifugation of the blood samples at 2000×*g* for 10 minutes. The samples were stored at -20 °C until the biochemistry analyses were performed. No experimental applications or dietary changes were made in relation to the animals. Study groups were created as given in the following table (Table 1).

Biochemical analyses. Blood serum levels of alkaline phosphatase (ALP), alanine transaminase (ALT), aspartate transaminase (AST), creatine kinase (CK), calcium, cholesterol, creatinine, iron, magnesium, phosphorus, total lipids, triglycerides and uric acid were measured in duplicate by a spectrophotometer (Multiskan GO, Thermo). During these analyses we used commercial kits (TECO Diagnostics) according to the manufacturer's instructions.

Statistical analysis of data. In the present study, results of the biochemical analyses were evaluated for statistical analyses. MINITAB statistical software package version 16.1 was used in the evaluation of the data (ANONYMOUS, 2010). One-way analysis of variance (One-Way ANOVA) was performed for the study parameters. Significance of statistical differences between the groups was determined by the Tukey test.

Results

In the groups of females; ALT, calcium, CK, creatinine, phosphorus, magnesium, total lipids, and uric acid values exhibited statistically significant ($P<0.05$) differences between the age groups of Native Hair goats. No statistically significant differences were determined in ALP, AST, cholesterol, triglycerides and iron values between the age groups of females of Native Hair goats (Table 2).

Within the female Honamlı goats, ALT, AST, cholesterol, CK, creatinine, phosphorus, magnesium, total lipids and triglycerides values differed significantly ($P<0.05$) between the age groups (Table 2).

In the male Native Hair goats ALT, AST, calcium, CK, creatinine, phosphorus, magnesium, total lipids, triglycerides and uric acid values differed significantly ($P<0.05$) according to the age groups. In the male Honamlı goats, ALT, AST, calcium, cholesterol, CK, creatinine, total lipids and triglycerides values differed significantly ($P<0.05$) between the different age groups (Table 3).

Table 1. The characteristics of the study groups

No. of the group	Features of the group	No. of the goats
1	Female, Native Hair Goat, 4 months of age	15
2	Female, Honamlı Goat, 4 months of age	15
3	Male, Native Hair Goat, 4 months of age	15
4	Male, Honamlı Goat, 4 months of age	15
5	Female, Native Hair Goat, 8 months of age	15
6	Female, Honamlı Goat, 8 months of age	15
7	Male, Native Hair Goat, 8 months of age	15
8	Male, Honamlı Goat, 8 months of age	15
9	Female, Native Hair Goat, 12 months of age	15
10	Female, Honamlı Goat, 12 months of age	15
11	Male, Native Hair Goat, 12 months of age	15
12	Male, Honamlı Goat, 12 months of age	15

Table 2. Group (n = 15) means (mean ± standard error) of the females according to the age groups.

	Native Hair Goats				Honamlı goats			
	4 months	8 months	12 months	P	4 months	8 months	12 months	P
ALP (IU/L)	232.9 ± 46.9	162.7 ± 49.8	116 ± 19.8	NS	239.1 ± 43.1	158.8 ± 43.7	150.9 ± 12.7	NS
ALT (IU/L)	16.71 ± 1.00 ^{c}	24.3 ± 0.9 ^{b}	35.6 ± 2.48 ^{a}	<0.001	17.24 ± 1.00 ^{c}	26.1 ± 1.35 ^{b}	45.0 ± 2.58 ^{a}	<0.001
AST (IU/L)	46.1 ± 5.96	51.43 ± 3.86	58.95 ± 1.71	NS	43.71 ± 3.42 ^{c}	82.06 ± 3.13 ^{a}	54.38 ± 2.65 ^{b}	<0.001
Total Lipids (mg/dL)	192.7 ± 13.9 ^{b}	390.6 ± 10.1 ^{a}	394.2 ± 8.66 ^{a}	<0.001	137.2 ± 11.3 ^{b}	320.9 ± 19.7 ^{a}	369.5 ± 9.20 ^{a}	<0.001
Triglycerides (mg/dL)	21.06 ± 3.87	24.00 ± 3.25	19.86 ± 2.40	NS	14.41 ± 2.00 ^{b}	23.74 ± 1.42 ^{a}	26.01 ± 2.08 ^{a}	<0.001
Cholesterol (mg/dL)	104.1 ± 13.5	94.34 ± 5.30	85.14 ± 3.52	NS	94.13 ± 7.84 ^{b}	128.45 ± 4.96 ^{a}	84.11 ± 4.00 ^{b}	<0.001
CK (IU/L)	62.59 ± 4.38 ^{b}	52.07 ± 7.18 ^{b}	90.9 ± 10 ^{a}	<0.05	84.71 ± 8.97 ^{a}	43.29 ± 4.25 ^{b}	102.1 ± 14.7 ^{a}	<0.001
Creatinine (mg/dL)	0.83 ± 0.06 ^{b}	0.91 ± 0.04 ^{b}	1.18 ± 0.05 ^{a}	<0.001	0.58 ± 0.04 ^{c}	1.10 ± 0.08 ^{a}	0.83 ± 0.05 ^{b}	<0.001
Phosphorus (mg/dL)	8.78 ± 0.37 ^{a}	7.48 ± 0.75 ^{ab}	7.17 ± 0.29 ^{b}	<0.05	7.58 ± 0.24 ^{ab}	8.84 ± 0.75 ^{a}	6.43 ± 0.33 ^{b}	<0.05
Iron (µg/dL)	135.2 ± 7.84	137.9 ± 4.92	141.2 ± 2.95	NS	136.4 ± 4.69	141.4 ± 2.94	143.3 ± 3.91	NS
Magnesium (mg/dL)	2.71 ± 0.12 ^{a}	2.45 ± 0.11 ^{b}	2.58 ± 0.08 ^{ab}	<0.05	2.41 ± 0.10 ^{b}	2.66 ± 0.11 ^{ab}	3.03 ± 0.12 ^{a}	<0.05
Calcium (mg/dL)	10.07 ± 0.26 ^{a}	8.11 ± 0.70 ^{b}	10.69 ± 0.14 ^{a}	<0.001	10.42 ± 0.34	11.06 ± 0.17	11.21 ± 0.19	NS
Uric acid (mg/dL)	0.88 ± 0.08 ^{a}	0.21 ± 0.05 ^{b}	0.39 ± 0.06 ^{b}	<0.001	0.53 ± 0.08	0.31 ± 0.04	0.41 ± 0.09	NS

Different letters in the same rows refer to statistical difference (P<0.05), NS: Not significant.

Table 3. Group (n = 15) means (mean ± standard error) of the males according to the age groups.

	Native Hair goats				Honamlı goats			
	4 months	8 months	12 months	P	4 months	8 months	12 months	P
ALP (IU/L)	236.8 ± 46.3	161.7 ± 44.9	154.3 ± 23.5	NS	232.7 ± 45.4	155.4 ± 49.5	143.9 ± 23.5	NS
ALT (IU/L)	18.93 ± 3.47^{b}	21.2 ± 3.57^{b}	34.9 ± 1.96^{a}	<0.05	16.3 ± 0.73^{c}	22.7 ± 1.51^{b}	42.5 ± 2.72^{a}	<0.001
AST (IU/L)	34.33 ± 4.22^{b}	47.24 ± 3.61^{b}	65.46 ± 4.38^{a}	<0.001	44.19 ± 5.36^{b}	91.93 ± 5.31^{a}	51.81 ± 2.18^{b}	<0.001
Total Lipids (mg/dL)	184.2 ± 10.0^{c}	331.7 ± 8.54^{b}	392.2 ± 9.61^{a}	<0.001	103.3 ± 12.3^{c}	315.3 ± 13.2^{b}	410.2 ± 12.0^{a}	<0.001
Triglycerides (mg/dL)	24.53 ± 3.28^{a}	13.15 ± 1.58^{ab}	19.56 ± 1.61^{b}	<0.05	17.63 ± 1.91^{b}	27.70 ± 2.55^{a}	23.64 ± 1.87^{ab}	<0.05
Cholesterol (mg/dL)	79.76 ± 8.11	86.80 ± 5.66	88.81 ± 5.25	NS	75.25 ± 3.66^{b}	120.41 ± 8.08^{a}	90.51 ± 6.51^{b}	<0.001
CK (IU/L)	57.80 ± 6.45^{b}	33.47 ± 4.36^{c}	89.07 ± 7.78^{a}	<0.001	58.38 ± 2.74^{b}	47.5 ± 13.1^{b}	89.64 ± 7.23^{a}	<0.05
Creatinine (mg/dL)	0.76 ± 0.06^{b}	0.98 ± 0.05^{ab}	1.16 ± 0.09^{a}	<0.05	0.56 ± 0.04^{b}	1.17 ± 0.07^{a}	0.98 ± 0.08^{a}	<0.001
Phosphorus (mg/dL)	9.26 ± 0.33^{a}	8.70 ± 0.62^{ab}	7.36 ± 0.29^{b}	<0.05	7.39 ± 0.25	9.60 ± 0.94	8.63 ± 0.63	NS
Iron (µg/dL)	143.2 ± 10.9	149.7 ± 2.22	150.9 ± 2.54	NS	145.3 ± 8.28	151.8 ± 4.19	152.4 ± 5.80	NS
Magnesium (mg/dL)	2.52 ± 0.10^{b}	2.71 ± 0.10^{b}	3.06 ± 0.09^{a}	<0.05	2.33 ± 0.07	2.60 ± 0.14	2.68 ± 0.10	NS
Calcium (mg/dL)	10.50 ± 0.33^{a}	8.66 ± 0.62^{b}	10.79 ± 0.17^{a}	<0.05	9.94 ± 0.25^{b}	11.04 ± 0.13^{a}	11.06 ± 0.16^{a}	<0.001
Uric acid (mg/dL)	0.70 ± 0.16^{a}	0.29 ± 0.05^{b}	0.55 ± 0.12^{ab}	<0.05	0.45 ± 0.05	0.36 ± 0.04	0.33 ± 0.08	NS

Different letters in the same rows refer to statistical difference (P<0.05), NS: Not significant.

Discussion

In the present study, there were no statistically significant differences for the ALP activities between the different breed and age groups. These ALP results were in accordance with the values reported by ELITOK (2012) from tests carried out on goats in the same age group.

ALT values exhibited significant age-dependent increases in the Honamlı males and females of both breeds, while significant increases in ALT values in the Native Hair goat males were observed at 12 months of age. Our results reflecting age-related ALT increases were in accordance with the values of a previous study performed in the Afyonkarahisar province of Turkey on Saanen goats in the same age groups (ELITOK, 2012).

Although there were important differences in all the age groups of Honamlı females, in the 8 month age group there was an increase in AST values compared to the other age groups. As for males, significant increases were seen in Honamlı and Native Hair goats for AST values in the age groups of 8 and 12 months, respectively. These findings of AST values are in accordance with a previous study (ELITOK, 2012) performed in the same age groups, and they increased with age.

It is understood that in female Native Hair goats a significant serum calcium rise occurs at 8 months of age. In males, significant increases in calcium are seen after the 4th month in Honamlı goats, and decreases in Native Hair goats in the period around 8 months of age. Although we could not find any studies reporting goat serum calcium values for the same age periods, PICCIONE et al. (2007) reported that no significant differences were found in calcium values between the monthly age groups in intensively fed, goats after the period of 5 months of age, for 24 months. Compared to the findings of our study, these differences could occur from the different diets which were applied during the study.

In both genders of Honamlı goats, cholesterol levels increased in the age group of 8 months compared to the other age groups. Lower cholesterol levels, which increased with age, have been reported previously (ELITOK, 2012) for goats in the same age period. This discrepancy between the two studies may be due to dietary and breed differences.

We could not find any study reporting the CK levels of our study's age groups in goats. However, the study performed by TEMIZEL et al. (2009), examining naturally occurring heat shock cases in goats, reported CK values of the control group in the 3-4 months of age period similar to the CK values of our 4 months age group.

In both sexes, significant creatinine increases commenced in Native Hair and Honamlı goats at the age of 12 months and after the age period of 4 months, respectively. ELITOK (2012) reported that creatinine values increased with age in goats in the same age group. Putting these findings together, regarding changes in creatinine values, the breed factor may be concluded to be significant in terms of the age periods.

In the present study there was a significant decrease in serum phosphorus levels in both sexes of Native Hair goats in the age period of 12 months. Furthermore, phosphorus levels in the age groups of 4 and 8 months were generally similar to the data in the study of POLAT and DELLAL (2008), which was carried out on Angora goats in the period of 4-8 months of age. In this regard, it was concluded that serum phosphorus levels could serve as valuable data for studies of Honamlı and Native Hair goats.

In the present study relatively high iron values were obtained compared to the control values of the study of ALTUĞ et al. (2013) carried out in Ağrı province of Turkey. This difference could be a result of the higher age group (12-72 months) used by the study of ALTUĞ et al. (2013).

Magnesium values of the present study were lower than that of ABDELRAHMAN (2009) performed in Jordan on Shami goats in the 3 and 6 months (respectively 3.7 and 3.2 mg/dL) of age. On the other hand, serum magnesium values were reported as 2 mg/dL, in the study of ALCALDE et al. (1999) performed in Brazil on Anglonubi and Saanen goats, average age of 6 months. These differences may originate from the type of diets applied in these studies. Considering the different levels of serum magnesium in the different studies reported, it would be useful to examine the levels of bioelements according to the goat breeds reared in different regions of Turkey by performing new studies.

Total lipid values of the 4-month age group were found to be consistent with the results of the study of MONDALA et al. (2007) in the same age group. On the other hand the total lipid values obtained in our groups of 8 and 12 months were consistent with the values of the study of ANWAR et al. (2012) which was carried on the 1-1.5 year old goats. Considering the above data together it was concluded that total lipid values in goats increase after 4 months of age, and could have important differences between the breeds.

There were significant increases in triglyceride values of female Honamlı goats after 4 months of age. In a previous study (ELITOK, 2012) performed in the same age group of goats, triglyceride levels increased with age. Taken together these data, it could be concluded that in age groups of goats, different breed, gender and nutritional factors could be effective in the course of triglyceride values.

In both genders of the Native Hair goats uric acid values were decreased after 4 months of age. We could not find any studies reporting the serum uric acid values of the present age groups and studies were usually reporting the values of uric acid in urine of goats (BELENGUER et al., 2002; ÇETINKAYA et al., 2010). On the other hand in a study (FIDANCI et al., 2001) on 1 year old female Angora goats with different genotypes, it was reported that even in the different genotypes of the same breed serum uric acid values showed significant differences. It was concluded that mean uric acid values obtained in the present study were higher than the values reported by FIDANCI et al. (2001) and could be expose different values between the breeds.

Consequently, levels of clinical biochemistry parameters of goats within the period of the first year of life were reported for the first time by the present study. It is contemplated that the results obtained with this study, would contribute to satisfy the lack of literature about clinical biochemistry values of the goats and expected to constitute a resource for designing of the new studies. KHANUM et al. (2000) reported that in goats hormonal changes could begin to occur at 4th month after the birth. Consistent with these data some of our parameters started to change after 4 months of age. In this regard, it can be suggested to consider the 4 months of age is critical age for planning the future studies on goats.

Conclusions

Present study strongly ($P<0.001$) indicates that there are age-associated parallel increases in ALT activities of females and total lipid values of males in Honamlı and Native Hair goats in their first year of life. The study also indicates that analyzed biochemical parameters are started to change usually after 4 months of age in the studied goats.

Conflict of interest

The author wise to confirm that there is no conflict of interest associated with this article.

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References

ABDELRAHMAN, M. (2009): General performance of growing Shami kids fed high energy and protected methionine. Asian J. Anim. Vet. Adv. 2, 52-59.

ALCALDE, C. R., J. M. B.EZEQUIEL, A. D. F. LEMA, E. B. MALHEIROS (1999): Endogenous losses and coefficients of apparent and true absorption of magnesium in goats. Rev. Bras. Zootecn. 6, 1347-1357.

ALTUĞ, N., S. ARSLAN, N. YÜKSEK, İ. KELEŞ, İ. H.YÖRÜK, Y. BAŞBUĞAN, İ. AYTEKIN (2013): The levels of trace elements and selected vitamins in goats with chronic fluorosis. Turk. J. Vet. Anim. Sci. 37, 529-534.

ANONYMOUS (2010): MINITAB for Windows version release 16.1, Minitab Inc.

ANWAR, M. M., T. A. RAMADAN, T. A. TAHA (2012): Serum metabolites, milk yield, and physiological responses during the first week after kidding in Anglo-Nubian, Angora, Baladi, and Damascus goats under subtropical conditions. J. Anim. Sci. 90, 4795-4806.

BELENGUER, A., D. YANEZ, J. BALCELLS, N. H. OZDEMIR BABER, M. GONZALEZ RONQUILLO (2002): Urinary excretion of purine derivatives and prediction of rumen microbial outflow in goats. Livest. Prod. Sci. 2-3, 127-135.

ÇETINKAYA, N., M. SALMAN, B. GENC (2010): Estimation of the microbial N flow to small intestine in Saanen goats and kids based on urinary excretion of purin derivatives by the use of spot urine sampling. Kafkas Univ. Vet. Fak. 1, 75-79.

ELITOK, B. (2012): Reference values for hematological and biochemical parameters in Saanen goats breeding in Afyonkarahisar province. Kocatepe Vet. J. 1, 7-11.

ELMAZ, Ö., M. SAATCI, N. MAMAK, B. DAG, A. H. AKTAS, B. GOK (2012a): The determination of some morphological characteristics of Honamlı goat and kids. Kafkas Univ. Vet. Fak. 3, 481-485.

ELMAZ, Ö., M. SAATCI, B. DAĞ, A. H. AKTAŞ, A. ATA, M. Ş. GÜLAY, N. MAMAK, B. GÖK (2012b): Some descriptive characteristics of a new goat breed called Honamli in Turkey. Trop. Anim. Health. Pro. 44, 1913-1920.

ERDURAN, H., M. KIRBAŞ (2010): Goat Farming and Breeding Studies in Konya Province, National Congress of Goat Husbandry, first ed., Çanakkale.

FIDANCI, U. R., F. TURGAY, S. ZENGIN, F. KARGIN, S. ÇELIK, S. TAŞDEMIR (2001): The effect of genotype on the antioxidative metabolism in Angora goats. Turk. J. Vet. Anim. Sci. 25, 975-981.

KHANUM, S. A., M. HUSSAIN, M. ALI, R. KAUSAR, A. M. CHEEMA (2000): Age at puberty in female dwarf goat kids and estrous cycle length on the basis of hormones. Pak. Vet. J. 2, 71-76.

MONDALA, M. K., P. BISWAS, B. ROYA, D. MAZUMDARB (2007): Effect of copper sources and levels on serum lipid profiles in Black Bengal (*Capra hircus*) kids. Small Ruminant Res. 67, 28-35.

ÖZDER, M. (2006): Goat Breeding, Izmir Province Sheep and Goat Breeders Association Publications, 1st ed., İzmir.

PICCIONE, G., G. CAOLA, R. REFINETTI (2007): Annual rhythmicity and maturation of physiological parameters in goats. Res. Vet. Sci. 2, 239-243.

PICCIONE, G., S. CASELLA, L. LUTRI, I. VAZZANA, V. FERRANTELLI, G. CAOLA (2010): Reference values for some haematological, haematochemical, and electrophoretic parameters in the Girgentana goat. Turk. J. Vet. Anim. Sci. 2, 197-204.

PICCIONE, G., V. MONTEVERDE, M. RIZZO, I. VAZZANA, A. ASSENZA, A. ZUMBO, P. P. NIUTTA (2014): Reference intervals of some electrophoretic and haematological parameters in Italian goats: comparison between Girgentana and Aspromontana breeds. J. Applied Anim. Res. 42, 434-439.

POLAT, H., G. DELLAL (2008): Changes of serum calcium (Ca) and phosphorus (P) levels in Angora goat kids. J. Agric. Sci. 2, 139-142.

TEMIZEL, E. M., S. SENTURK, S. KASAP (2009): Clinical, haematological and biochemical findings in Saanen goat kids with naturally occuring heat stroke. Tierärztl. Prax. Ausg. G. Grosstiere Nutztiere 4, 236-241.

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SAŽETAK

Honamli koza je nova pasmina koza pa su literaturni podatci o njoj vrlo oskudni. Jedna je od pasmina s najvećim mogućnostima za proizvodnju mesa u Turskoj. Cilj je ovog rada odrediti promjene biokemijskih vrijednosti u krvnom serumu Honamli koza i dugodlakih koza za vrijeme spolnog sazrijevanja. Za istraživanje su odabrani neki biokemijski pokazatelji povezani s proizvodnjom mesa. Uzorci krvi Honamli koza (n = 90, po 45 životinja oba spola) i dugodlakih koza (n = 90, po 45 životinja oba spola) uzeti su od stada u Zapadnom Mediteranskom području Turske. Vrijednosti alkalne fosfataze (ALP), alanin transaminaze (ALT), aspartat transaminaze (AST), kreatin kinaze (CK), kalcija, kolesterola, kreatinina, željeza, magnezija, fosfora, ukupnih lipida, triglicerida i mokraćne kiseline izmjerene su u uzorcima seruma uzetima od muških i ženskih životinja obiju pasmina podijeljenih u skupine prema dobi od 4, 8 i 12 mjeseci. Jednostavna analiza varijance i Tukeyev test rabljeni su za statističku obradbu podataka. I u muških i u ženskih životinja ustanovljene su značajne razlike ($P<0,05$) među dobnim skupinama za razine ALT, AST, CK, kalcija, kolesterola, kreatinina, željeza, magnezija, fosfora, ukupnih lipida, triglicerida i mokraćne kiseline. Nalazi pokazuju usporedno povećanje vrijednosti ALT u ženskih životinja i vrijednosti ukupnih lipida u muških životinja. Analizirane biokemijske vrijednosti obično se mijenjaju nakon 4 mjeseca starosti u usporedbi s drugim dobnim skupinama.

Ključne riječi: Honamli, dugodlake koze, krv, biokemijska obilježja