Characterization of Enzymatic Profile of Blood Collected from Rabbits (Belgian Giant Breed) and Hares (*Lepus europaeus Pallas*)

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Abstract

The domains of application of measuring the enzymes activity include: appreciation of functional maturity and the ability to adapt of production animals, eredopathology, the diagnosis of locomotors syndromes, pathology of the nervous system, blood pathology, deficiency states and intoxications diagnosis. This document is part of a larger study, which aims the comparative characterization of the physiological status and comparative characterization of meat from rabbits (Belgian Giant breed) and hares (*Lepus europaeus Pallas*). Characterization of enzymatic profile was determined using a biochemical automatic analyzer ACCENT 200. To establish the enzymatic profile were determined alanin-aminotransferase (ALAT), the amylase, alkaline phosphatase (ALP), aspartat-aminotransferase (ASAT). Mean values of enzymes varied for rabbits and hares. After statistical analysis were enlightened insignificant differences between sexes at the level of same breed, with the exception of ASAT (aspartat-aminotransferase) where was observed significant differences between females and males for hares ($p>0.01$). The result of this study provide an alternative set of biochemical reference values of serum that can be used in the clinical evaluation of the rabbits and hare by gender. However was not observed deviations from normal enzymatic profile of blood, characterizing thus the studied animals (rabbits and hares) as being healthy.

Keywords: *blood, enzymatic profile, rabbit, hare*

INTRODUCTION

The assessment of functional maturity and adaptive capacity by measuring enzyme activity can be a criterion in the selection of animals (Archetti *et al.,* 2008; Burnett *et al.,* 2003). Blood contains a myriad of metabolites and other constituents, which provide a valuable medium for clinical investigation and assessment of nutritional status of human beings and animals. Dietary components have measurable effects on blood components hence, blood constituents are widely used in nutritional evaluation and survey of animal (Gbore and Akele, 2010; Paci *et al.,* 2007).

AIMS AND OBJECTIVES

The aim of this study was to establish the physiological status of rabbits (Belgian Giant breed) and hares (*Lepus europaeus Pallas*) by determining the enzymatic profile of blood. The objectives have been the comparative assessment of serum enzyme activity for both species, based on gender, the animals being at the sexual maturity to determine differences that occur depending on the habitat in which they live.

MATERIALS AND METHODS

The biological material consisted of 85 individuals: 49 hares (24 males and 25 females) and 36 rabbits (5 males and 31 females) belonging to Belgian Giant breed. Hares were collected during hunting seasons from Iaşi County hunting funds (Coarnele Caprei, Ciurea, Cotu Morii). Both species were studied at the age of reproductive maturity, adults (11-12 months). Characterization of enzymatic profile was determined using a biochemical automatic analyzer ACCENT 200. Blood sampling for enzymatic profile was harvested in vacuntainers without anticoagulant

Tab. 1. The enzymatic profile for hares and rabbits (Belgian Giant breed) (U/L).

The enzymatic profile		$\overline{X} \pm S\overline{x}$	V%	S^2	Min	Max
females Belgian Giant	ALAT (U/L)	45.14±1.72	10.11	20.8	41.00	54.00
	Amylase (U/L)	122.33±1.91	3.82	21.9	118.00	130.00
	ALP (U/L)	246.15±84.17	96.71	51.7	107.20	797.50
	ASAT (U/L)	246.71±34.52	37.02	81.2	40.00	289.00
males Belgian Giant	ALAT (U/L)	43.67±0.88	3.50	2.3	42.00	45.00
	Amylase (U/L)	124.73±11.86	16.47	42.0	110.00	148.20
	ALP (U/L)	281.33±5.36	3.30	86.3	271.00	289.00
	ASAT (U/L)	120.00±0.58	0.83	1.0	119.00	121.00
females *Lepus europaeus*	ALAT (U/L)	205.70±68.88	20.50	43.0	15.30	589.30
	Amylase (U/L)	422.60±80.89	57.43	59.0	73.40	761.30
	ALP (U/L)	78.50±22.76	36.99	43.0	59.38	204.40
	ASAT (U/L)	165.70±60.84[a]	51.10	33.1	31.30	604.10
males *Lepus europaeus*	ALAT (U/L)	300.61±82.82	37.92	54.3	54.10	664.50
	Amylase (U/L)	653.67±112.10	48.50	14.1	195.70	1140.00
	ALP (U/L)	171.90±55.06	40.60	29.6	32.50	431.40
	ASAT (U/L)	292.31±177.59[b]	24.80	25.7	51.90	1548.70

(with red cap). At hares, blood was collected from the auricular and ulnar veins. In rabbits, blood collection was performed from auricular veins. For statistical interpretation, first was used common statistical estimators calculation, arithmetic mean ($\bar{X}\bar{X}$), standard deviation (s), variance (S^2) and coefficient of variation (V%) using the software algorithm. To test the statistical significance of differences between the studied characters, we used ANOVA Single Factor algorithm included in Microsoft Excel software package.

RESULTS AND DISCUSSION

From a quantitative perspective, the highest values are observed for hare males for amylase (653.7 U/L), followed by hare females, with averages of 422.6 U/L; for rabbits the amylase value were close. For ALAT and ALP the average values determined were relatively similar for both species. The highest values for ASAT (292.31 U/L) were determined for hare males, hare females recording lower values (165.7 U/L). The results are relative similar with the dates available from Paci *et al.* (2007) for hares. For rabbits, obtained values were increased because of the breed (Giant Belgian) and age, compared to the dates from specialized literature (Burnett *et al.,* 2006), Ewuola and Egbunike (2008), studies performed in New Zealand White and Chinchilla breeds).

After applying the statistical analysis were enlightened insignificant differences between sexes at the level of same breed, with the exception of ASAT (aspartat-aminotransferase) where was observed significant differences between females and males for hares ($p>0.01$).

CONCLUSION

Mean values of enzymes varied for rabbits and hares. The result of this study provide an alternative set of biochemical reference values of serum that can be used in the clinical evaluation of the rabbits and hare, by gender.

REFERENCES

1. Archetti I, Tittorelli C, Cerioli M, Brivia R, Grilli G, Lavazza A (2008). Serum Chemistry and Hematology values in commercial rabbits, 9th World Rabbit Congress, Verona, Italy.
2. Burnett N, Mathura K, Metivier KS, Holder RB, Brown G, Campbell M (2006). An investigation into hematological and serum chemistry parameters of rabbits in Trinidad, World Rabbit Science, Vol. 14, 175-187.
3. Ewuola EO and Egbunike GN (2008). Haematological and serum biochemical response of growing rabbit bucks fed dietary fumonisin B_1, African Journal of Biotechnology, Vol. 7, 4304-4309.
4. Gbore FA and Akele O (2010). Growth performance, haematology and serum biochemistry of female rabbits (*Oryctolagus cuniculus*) fed dietary fumonisin, Veterinarski Arhiv, Vol. 80 (3), 431-443.
5. Paci Gisella, Lavazza A, Ferretti M, Bagliacca M (2007). Relationship between habitat, densities and metabolic profile in brown hares (*Lepus europaeus* Pallas), Italian J of Animal Sc, Vol. 6, 241-255.