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Frequency distribution of metabolic profile parameters in sows

Dragan ROGOŽARSKI[1)], Jovan BOJKOVSKI[2)], Renata RELIC[3)], Bozidar SAVIC[4)], Tihomir PETRUJKIC[2)]

[1)] Specialistic Veterinary Institute,Pozarevac, Dunavska 89,Serbia
[2)] Faculty of Veterinary medicine, University of Belgrade, Bulevar oslobodjenja 18, Belgrade, Serbia
[3)] Faculty of Agriculture, University of Belgrade, Nemanjina 6, Belgrade-Zemun, Serbia
[4)] Scientific Veterinary Institute of Serbia, Vojvode Toze 14, Belgrade, Serbia

Abstract. In this paper we presented metabolic profile of sows from one industrial type farm. We monitored the following parameters: phosphorus, calcium, bilirubin, total protein, glucose, magnesium, and urea in blood. We found 7 sows with phosphorus level in normal range, 4 sows with hypophosphatemia and 9 with hyperphosphatemia. In 5 sows calcium values ranged within the physiological values, in 13 sows is moved above the normal values and in 2 ranged below the permissible value. Bilirubin was in all 20 sows above the permitted value. Total proteins were in 6 sows in normal range, in 13 were bellow and in 1 above upper physiological limit. State of hypoglycemia was founded in 15 sows and in 5 sows glucose levels were in physiological limits. Magnesium values were above the physiological values in 9 sows, in 6 bellow limits and in 5 was within tolerable limits. Values of urea are normal in 18 sows and above physiological limit in 2 sows.

Key words: metabolic profile, sows, lactation

INTRODUCTION

Physiological values of blood biochemical parameters are very different for each animal species. For us, the most interesting metabolic profile parameters are for economic important species animal that actually. Parameters of metabolic profile may be an indicator of deficient nutrition, a variety of clinical and subclinical disease (Šamanc, 2009). Specifically, clinically healthy animals have regulatory mechanisms and can be adapted to different physiological states. However, for sows and boars do not show symptoms of the disease may occur in disorders of reproduction health status (Petrujkić *et.al*,.2009; Bojkovski *et al.*, 2010). A large number of literature data has information related to the concentration of total protein, albumin, glucose, total bilirubin, calcium and inorganic phosphorus in blood serum of sows examined at the beginning of the end lactation period of 28 days in relation to parity and number of piglets per litter (Sieverding, 2000).Today in literature there are few data on the parameters of the metabolic profile in sows during lactation. During lactation may appear different health problems characterized by loss of appetite and progressive weight loss (Šamanc *et al.,* 2009). This data led us to analyzed biochemical parameters in sows during lactation.

MATERIALS AND METODS

We randomly selected 20 lactating sows from one industrial type pig farm type. Blood sampling was done in vacuum, laboratory serological tests. Featured blood sera were divided into two plastic tubes ("Eppendorf") of 1.5 ml and kept in a freezer at -18 º C until serological analysis and biochemical analysis.

RESULTS AND DISCUSION

Tables 1 and 2 show results of blood analyses:

Tab. 1.

Results of biochemical analysis of lactation sows in blood serum

Parameters*	N	Mean	SD	Minimum	Maximum	C_V (%)
P (mmol/l)	20	2.87	1.42	0.84	6.17	49.64
Ca (mmol/l)	20	4.19	2.01	1.00	8.50	48.07
Ca/P relation	20	1.86	1.60	0.26	6.90	86.38
Bilirubin (µmol/l)	20	75.39	121.15	3.91	524.33	160.70
Total proteins (g/l)	20	69.33	20.94	3.80	123.43	30.21
Glucosa (mmol/l)	20	2.74	0.86	1.15	3.76	31.30
Mg (mmol/l)	20	1.11	0.50	0.08	1.67	44.89
Urea (mmol/l)	20	6.08	1.92	3.48	11.29	31.59

*SD – standard deviation; C_V – coefficient of variation;

Tab. 2.

Frequency distribution of serum parameters values in lactation sows

Parameter*	Number of sows		
	Values in normal range	Values under lower limit	Values above upper limit
P (mmol/l)	7	4	9
Ca (mmol/l)	5	2	13
Bilirubin (µmol/l)	/	/	20
Total proteins (g/l)	6	13	1
Glucosa (mmol/l)	5	15	/
Mg (mmol/l)	5	6	9
Urea (mmol/l)	18	/	2

**Reference values for specific tests: P color test (1.70 - 3.00 mmol/l); Ca okrezolftal (1.98 – 3.00 mmol/l); bilirubin Jendrassik-Grof (2.00 – 3.00 µmol/l); total protein (3.60 – 5.20 mmol/l); magnesium Xylidil blue (0.8 – 1.23 mmol/l); urea BUN-kinet (2.80 – 8.60 mmol/l)

As is presented in tables, and according to given references, measured parameters varied around physiological values, especially levels of bilirubin. We found 7 sows with phosphorus level in normal range, 4 sows with hypophosphatemia and 9 with hyperphosphatemia. In 5 sows calcium values ranged within the physiological values, in 13 sows is moved above the normal values and in 2 ranged below the permissible value. The Ca/P ratio is presented in very different values, from 0.26 to 6.90. Bilirubin was in all 20 sows

above the permitted value. Total proteins were in 6 sows in normal range, in 13 were bellow and in 1 above upper physiological limit. State of hypoglycemia was founded in 15 sows and in 5 sows glucose levels were in physiological limits. Magnesium values were above the physiological values in 9 sows, in 6 bellow limits and in 5 was within tolerable limits. Values of urea are normal in 18 sows and above physiological limit in 2 sows.

CONCLUSIONS

Our recommendation is to periodically analyze the biochemical parameters of sows from farms of industrial type.

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