VALUES OF SOME COMPONENTS OF BLOOD SERUM DEPENDING ON GESTATION STAGE IN GRAZING SOWS

VALOAREA UNOR COMPONENTE ALE SERULUI SANGUIN ÎN FUNCȚIE DE STADIUL GESTAȚIEI LA SCROAFELE EXPLOATATE PE PĂȘUNE

CORNELIA PETROMAN, I. PETROMAN, N. PACALA, DIANA MARIN

Agricultural and Veterinary University of the Banat, Timişoara, Romania

Abstract: *The aim of the study we have carried out was to see if there are differences between the values of blood serum components (β estradiol, progesterone, and macro-elements) depending on gestation period in both Landrace bearing sows raised extensively (grazing sows) and Landrace bearing sows raised intensively. The results we are presented in this paper. They show big differences between the values of β estradiol in different stages of gestation in Landrace bearing sows. As far as the level of progesterone is concerned, it reaches rather close values with a peak in the 3rd month of gestation, also close to the value in the 2nd month of gestation. As for macro-elements, their level fits both data in literature and our own data resulted from a study on bearing sows raised in intensive systems.*

Rezumat: *Scopul acestui studiu a fost să vedem dacă sunt diferențe între valorile componentelor serului sanguin (β estradiol, progesteron, şi macro-elemente) în funcție de perioada de gestație atât la scroafele gestante Landrace, crescute extensiv (pe păşune), cât şi la scroafele gestante Landrace, crescute intensiv. În ceea ce priveşte nivelul progesteronului, acesta atinge valori apropiate între ele, cu o valoare maximă în luna a 3-a de gestație, valori apropiate şi de cele din luna a 2-a de gestație. Macro-elementele ating niveluri care corespund atât datelor din literatura de specialitate, cât şi datelor noastre obținute ca rezultat al unui studiu asupra scroafelor gestante crescute în sistem intensiv.*

Key words: *sows, gestation, blood, hormone components, macro-elements*
Cuvinte cheie: *scroafe, sânge, componente hormonale, macro-elemente*

INTRODUCTION

Gestation is a central reference point of all endocrine reproduction functions (1) – they define three distinct yet correlated systems:

- the *endocrine system* that regulates gamete-genesis, sexual behaviour, ovulation, conception, and implantation;
- the *metabolic-homeostatic-endocrine system* that acts on adaptation skills of the maternal organism to the internal changes conditioned by gestation;
- and the *endocrine system of post-implantation* that is considered the central aspect of viviparity.

After fecundation, the zygote goes along the oviduct and reaches the uterus arms since it needs in order to develop besides its own nutrition sources an exogenous energetic substratum.

The female genitalia ensure a nutritious environment until nidation (13 days) and even further on.

Developing this nutritious environment depends on the presence of progesterone that acts on the genitalia after they have been sensitivised by estrogens.

Blast cysts are free in the sow's uterus after 13 days; as a result of local contractions of the uterus, of the mutual rejection, and of an additive, precocious mechanism depending on the action of progesterone, there is nidation.

Progesterone eases the passage of natrium bicarbonate from blast cysts, then through the uterus epithelium into maternal circuit by turning carbon acid into carbon dioxide.

Due to the increase of the pH at the exit place of the natrium bicarbonate, blast cysts become sticky and favour the solubility of the epithelium of the uterus mucous.

At the beginning, there is adhesion, then penetration and nidation, all these processes taking place under hormone control.

The existence of a functional yellow body that develops in the first day of gestation and becomes a gestation yellow body is necessary first of all for the implantation.

The yellow body reaches maximum size after implantation and it secretes more progesterone than in the lutheal stage.

After placentation, the placenta takes over the synthesis of progesterone and estrogens.

MATERIALS AND METHOD

The study was carried out on 15 Landrace grazing bearing sows exploited in an intensive system on pasture and in different stages of gestation (1^{st} month – 3 bearing sows, 2^{nd} month – 5 bearing sows, 3^{rd} month – 4 bearing sows, 4^{th} month – 3 bearing sows) in which we dosed beta estrogide and progesterone in the blood as well as the macro-elements (calcium, magnesium, potassium, natrium, and chlorine) which we compared with literature results and with our own results on Landrace bearing sows exploited in industrial intensive systems.

RESULTS AND DISCUSSION

Analysing the variation of the quantity of estradiol in the blood in different stages of gestation in Landrace bearing sows exploited on pasture and comparing these results with our own results on bearing sows exploited in intensive industrial systems, we can see that the values are rather close and they fit the parameters indicated by other authors (Table 1).

Table 1

Results of dosing β estradiol in different gestation stages

Gestation stage	β estradiol (PG / ml)	
	Extensive system (pasture)	Intensive system (industrial)
1^{st} month	9.8	10.0
2^{nd} month	98.7	101.0
3^{rd} month	38.2	36.1
4^{th} month	139.7	141.4

Comparing the level of β estradiol in different gestation stages we can see the following:

- in the 1^{st} month, no matter the exploitation system, the values are relatively close;
- in the 2^{nd} month, the level varies between 98.7 and 101.0 PG/ml, in favour of bearing sows exploited intensively;
- in the 3^{rd} month, the level of estrogens is close to 40 PG/ml, particularly in the case of the bearing sows exploited extensively.

As expected, there is a consistent increase of the oestrogen level during the last gestation period, no matter the exploitation system, with close results (139.7 and 141.4 PG/ml, respectively).

Similar results were also in the case of progesterone that had close values no matter the exploitation system.

The lowest value was in the 2nd gestation month in Landrace bearing sows exploited extensively, i.e. 17.94 NG/ml as shown in Table 2.

Table 2

Results of dosing progesterone in different gestation stages

Gestation stage	Progesterone (NG / ml)	
	Extensive system (pasture)	Intensive system (industrial)
1st month	34.83	33.50
2nd month	17.94	18.35
3rd month	37.20	36.40
4th month	20.82	21.68

Macro-element content in Landrace bearing sows exploited in extensive systems in different gestation stages is shown in Table 3.

Table 3

Macro-element content in blood serum in different gestation stages

Macro-element	U.M.	Gestation stage			
		1st month	2nd month	3rd month	4th month
Calcium	mg%	8.6	8.8	10.2	9.6
Magnesium	mg%	1.5	1.3	1.2	1.8
Potassium	mEq/l	3.8	7.1	6.2	5.2
Natrium	mEq/l	130.0	137.0	132.0	140.0
Chlorine	mEq/l	88.8	97.8	104.0	115.8

As for the content of blood serum in macro-elements, data presented in Table 3 show that the values we have found in Landrace bearing sows exploited extensively do not differ much from the values in the bearing sows exploited intensively; they even fit the values corresponding to the gestation stages such as published in literature.

CONCLUSIONS

As a result of our research, we can draw the following conclusions:

- There is variety of the amount of β estradiol (between 9.8 and 139.7 PG/ml) depending the gestation stage and the exploitation system compared to the level of progesterone in blood; thus: it reaches close values with a maximum level of 37.2 NG/ml in the 3rd month of gestation; in the last gestation month, it reaches 20.32 NG/ml, a value very close to the level reached during the 2nd gestation month.
- The level of macro-elements in the blood serum increased steadily (calcium and natrium) or it had a relatively constant evolution during the bearing sows' gestation period (magnesium, potassium, chlorine) in extensive systems.
- Our data fit the data supplied by literature and are close to the data we got from the survey of bearing sows exploited in industrial systems.

LITERATURE

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