WAYS OF CONDUCTING PUERPERIUM IN SOWS

POSIBILITĂȚI DE DIRIJARE A PUERPERIUMULUI LA SCROAFE

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Abstract. *In the conditions of raising animals on farms with a high degree of artificiality and mechanisation, the evolution of the puerperium influences the increase of the fecundity and birth rate percentage and results in an increase of the duration of exploitation of sows. This evolution depends on the hypothalamus-hypophysis hormonal complex that, during the first post-partum days, secretes gonadotropic hormones that trigger ovary activity. The earlier the ovary activity, the earlier the uterus involution, degradation and eviction of secretions, and the morphological and functional recovery of the endometrium are. Ovary activity in sows in puerperium is characterised by a substantial diminution of the size of yellow gestation bodies during the first 7 post-partum days and the turning of the red colour in the first day into dark brown and, towards the end, into mother-of-pearl white.*

Rezumat. *În condiţiile creşterii animalelor în ferme cu un grad ridicat de artificializare şi mecanizare, evoluţia puerperiumului influenţează creşterea procentului de fecunditate şi natalitate şi prelungirea duratei de exploatare a scroafelor. Această evoluţie depinde de complexul hormonal hipotalamo-hipofizar care, în primele zile post-partum, secretă hormoni gonadotropi ce vor declanşa activitatea ovariană. Cu cât activitatea ovariană începe mai devreme, cu atât involuţia uterină, degradarea şi eliminarea lohiilor şi refacerea morfo-funcţională a endometrului are loc mai devreme. Activitatea ovariană la scroafele în puerperium se caracterizează prin reducerea substanţială a dimensiunilor corpilor galbeni de gestaţie în primele 7 zile de la fătare şi modificarea culorii din roşii în prima zi în brun închis iar la sfârşitul lactaţiei alb sidefiu.*

Key Words: *sows, puerperium, ways of conducting puerperium*
Cuvinte-cheie*: scroafe, puerperium, posibilităţi de dirijare a puerperiumului*

INTRODUCTION

The follicle apparatus keeps almost unchanged during the early puerperium. The size of ovary follicles diminishes considerably during the first lactation days; it starts growing again after weaning the piglets, being very active the fourth days after weaning (BOITOR, 1984; PETROMAN, 1998; PETROMAN, 1997). The uterus endothelium starts regenerating the seventh day of the puerperium and is completely recovered 21 days after calving, according to some authors (PALMER, 1965), while some others think that this period comes to an end 28 days after parturition (BOITOR, 1984; PALMER, 1965).

The uterus involution process consists of the re-sorption of the blood vessels and in the progressive atrophy of the neo-formation vessels, the degeneration of some endometrium epithelium cells, the recovery of the uterus glands, the retraction and contraction of the muscle fibres of the myometrium, resulting in the diminution of the uterus volume.

The uterus metabolism intensifies, and the number of histocytes, lymphocytes, leukocytes, eusinophilia grows. Among them, histocytes are very important, as they clean the uterus mucous through phagocytosis. Leukocyte migration helps the forming of the protective barrier protecting the uterus from infection.

The uterus recovery phase post-partum is conducted and dominated by extraneous hormones and by the neural-vegetative system, by the speed of the regression processes, by local defence, and by the preparation of the uterus for a new gestation. The untroubled function

of the neural-vegetative system and normal homeostasis ensure the evolution of a physiological puerperium. This system conducts leukocyte migration, the development of the protective barrier, the tissue contraction, the discharge of the secretions and of the degenerated tissue, the mucus secretion, and the endometrium recovery (BOITOR, 1984; PETROMAN; 2002).

The process of self-sterilisation of the uterus is of utmost importance, as it ensures the decrease of the number of germs and their pathogenesis. Uterus self-purifying occurs through leukocytosis, through the stimulation of the macrophages, through lymph and plasmocyte infiltrations, and through maturation of plasmocytes. We should note nevertheless the role of the environmental factors as stimuli of morpho-physiological processes at the level of the uterus in their relationship with general and local metabolism, with homeostasis. The functional capacity of the uterus stroma, very important in recovery and defence, can be troubled and even stopped by stress factors.

MATERIAL AND METHOD

Examination of the genitalia in sows exploited in intensive system, the number of yellow bodies and their distribution per ovaries, the values of some uterus measurements allow us to suggest a few measures that should be taken to conduct puerperium so that 28-30 days post-partum the genital tract be ready for a new gestation that contribute to the increase of fecundity and birth rate percentage as well as to a prolongation of the period of exploitation of the sows.

RESULTS AND DISCUSSION

Results collected after having slaughtered sows at different times of the puerperium period (2, 10, 17, and 28 days) because of different problems during the exploitation period are shown in Tables 1 and 2.

Table 1

Ovary weight during puerperium (g)

Puerperium period	Right ovary		Left ovary	
	$x \pm S_x$	V	$x \pm S_x$	V
2 days	16.95±1.30	17.10	17.78±1.40	18.06
10 days	10.42±1.10	23.54	10.69±1.10	22.94
17 days	5.32±0.60	25.15	5.65±0.70	27.62
28 days	2.83±0.30	23.60	2.90±0.30	23.07

Analysing data in Table 1, we can see some very important aspects, such as:

- in sows during puerperium, during breastfeeding the piglets for 28 days post-partum, ovary weight decreases steadily;
- weight diminution was more intense between days 2 and 10 and between days 10 and 17, after which it decreases slower.

Table 2

Ovary weight during puerperium (kg)

Puerperium period	$x \pm S_x$	V
2 days post-partum	3.15±0.20	14.00
10 days post-partum	1.40±0.12	19.20
17 days post-partum	1.18±0.09	17.10
28 days post-partum	0.78±0.08	25.20

Analysing data in Table 2, we can see the following:

- during puerperium there is an obvious decrease of the total weight of the uterus which, 2 days post-partum, weighed 3.15±0.20 kg and 28 days post-partum weighed 0.78±0.08, i.e. 4.04 times less within 26 days;
- during the first week of puerperium, uterus size diminution resulted in a decrease of its weight, i.e. 2.25 times less than 2 days post-partum (from 3.15±0.20 kg to 1.40±0.12 within 8 days).

In order to get a normal puerperium in sows on the ground of the observations we have made, we recommend the following ways of conducting puerperium so that we get good results in the reproduction activity on the farm:

1. Uterus self-defence against infection. Normally, in case of physiological evolution of the puerperium uterus, it is capable of eliminating bacterial content after calving before the infection reaches the endometrium and the myometrium, using mechanical means or through phagocytosis.

When bacteria enter the endometrium and overrunning these self-defence mechanisms, the uterus reacts through mechanisms that make immune-globulins move against germs and through the phagocytosis favoured by the immune-globulins, complements, and specific protective substances.

Uterus – as organ of the reticulo-histocytic system – is under the influence of the nutritious balance that can act through hormones or directly on the integrity of the endometrium and of uterus contraction. Food unbalance is at the basis of an environment allowing the multiplication of germs, the easier penetration of the uterus walls, associated with failure or lack of the uterus content discharge after parturition.

2. inter-relation between phagocytosis and diet. Phagocytosis – as the main uterus self-defence is done in three steps:

a) sensitivising bacteria to phagocytic attack;
b) intervention of the specific immune-globulin;
c) ingestion and enzymatic digestion.

Nutrition unbalance can act on steps a) and c); thus, lack of proteins neatly diminishes the number of phagocytes and their motility in the direction of antigens. But not only the amount of protein is important: quality also counts.

Lack of proteins in sows portions during puerperium results in a diminution of the antibodies (their synthesis needs amino acids such as lysine, methionine, treonine, and leucine). Synthesis of proteins from amino acids needs vitamins (pentatonic acid, vitamin B_6, thiamine, biotine, riboflavin, vitamin A) and enzymes (RNA-polymerase and RNA-synteresis).

Lack of magnesium influences both phagocytic digestion, as it intervenes in enzymatic activity, and in phagocyte availability.

Lack of copper, zinc, iron, and excess of copper diminish cytophage and phagocytic indices.

Lack of magnesium favours the development of a bacteria-friendly environment.

Through a proper diet (not only quantitatively, but also qualitatively) and through proper ratio proteins: vitamins: minerals we can conduct a normal puerperium that allow the genital tract to fight germs and avoid pathologic puerperium.

CONCLUSIONS

One of the main conditions for normal puerperium is rational diet, both quantitatively and qualitatively, differentiated per physiological state, toxin-free during gestation (and particularly during its second part) and post-partum. Before and after calving, portions should be rich in energetic principles to ensure sugar supplements necessary to parturition and post-

partum uterus involution, but in small amounts. Daily movement of sows exploited on pasture or getting up several times a day in the intensive breeding system enhances blood circulation, increases muscle, nerve, neural-endocrine tonus and, implicitly, enhances uterus involution.

Lack of movement favours the appearance of post-partum hypotony or atony of associated with unbalanced protein – vitamin – mineral diets, resulting in puerperal infections with impacts on fecundity and prolificacy percentage in sows and, implicitly, in the increase of the calving interval.

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