AGRICULTURAL SCIENCES

THE METHODS OF INTENSIFICATION OF THE COWS' REPRODUCTIVE FUNCTION

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Abstract:
It has been determined that the injection of a neurotropic and metabolic preparation Glutam 1M under a cow's skin at a dose of 20ml. on any day of pregnancy in the interval from 260 to 275 days for three days at a row in the last 10-day period of December, in January and February reduces a pregnancy period, a renewal period and a service period by 2.7 ($p<0.05$), 8.8 and 13.4 days; reduces the insemination period by 28.4% ($p<0.05$) that results in 17% increase in the number of animals which calve twice a year.

Keywords: a cow, calving, Glutam 1M preparation, reproductive function, twins.

The cows reproductive function considerably depends on the processes of uterus involution in a postpartum period followed after the pregnancy period and a calving process.

The calving in cows depends on many factors, the most important of which are the physiological state of a body, feeding conditions, the conditions of cows' keeping and preparation to calving . The research, conducted in many regions, testifies to the fact that calving in cows has its peculiarities, which result in the renewal of the cows' reproductive function.

A normal pregnancy ends in fast calving. After the third stage of calving starts a postpartum period which is accompanied by the involution of a cow's genitals up to the stage when there are favorable morphofunctional conditions for ovum fertilization and the development of a new pregnancy.

One of the methods of the intensification of the cow's reproductive function is getting two calves a year. There is a natural method, the essence of which lies in the fact that 2-5% of cows are pregnant with twins. Under the conditions of optimal feeding, high level of selective and veterinary work the cows do not lose longevity as well as milk yields and reproductive function. This aim can be achieved by the method of embryo transplantation, when an indigenous embryo is transferred into the cow with lower than medium productivity on the 7^{th} day after the insemination.

The third biotechnological method of getting the twins lies in using hormone preparations which stimulate the follicle growth and ovulation.

The essence of the fourth method lies in getting two calving a year. According to the New N.N. and the other ones, if in the cattle herd there is a number of cows in different state of reproductive cycle, in particular: those which were inseminated but not checked for pregnancy-20%; pregnant ones-60%; in a postpartum period-10%; sterile ones-10%, it proves to a good herd's reproductive state.

The maintaining of such a balance allows to have a second calving a year in 10-15% of cows, as the cows which calved in January and February will deliver one more calf under the condition of an effective insemination by the 15^{th} 20^{th} of March. That is why an increase in the number of cows which will calve in this period will result in additional number of calves, as the period for uterus involution will increase.

The intensity of the involution processes of the cows' reproductive system after a former pregnancy is very important for the efficiency of this method. The faster and the more qualitatively they occur, the more cows will calve for the second time. That is why the elaboration of the methods

of reducing the duration of the cow's pregnancy as well as studying of their effects on the further cow's reproductive ability are of current interest.

It has been established that the delivery in cows occurs as a result of functioning of a complicated complex of neurohumoral factors as well as of the control of a central nervous system and its most important part – the brain cortex. The most important thing in stimulating the calving is the interaction between the progesterone concentration, estrogens and especially glucocorticoids in the blood of pregnant cows.

The distortions of these interrelations can provoke the prolongation of pregnancy period, the pathologic labour, the gynecological disorders as well as have negative effects on the calves' vital activity.

It has been experimentally proved that artificial provoking of the delivery in cows by means of hormone preparations assists in the reduction of pregnancy period, but herewith, the number of animals with the detention of afterbirth as well as with the delivery of dead calves rises in number. There is another way to reduce the pregnancy duration. The essence of this method lies in using a neurotropic and metabolic preparation which can be given by injection on the 265-267 day and will result in the reduction of pregnancy period by 2 days. Herewith, the cows reproductive function improves. The impregnation after the first insemination increases, the service period as well as the insemination index decrease.

The purpose of the research was to develop a method which would intensify the cows' reproductive function by getting two calving a year from a greater number of cows.

The materials and the research methods. The research was conducted at a private farm enterprise "Savertsy" Popilnia district Zhytomyr oblast on the cows of Golstein black and dapple breed. Two groups were formed – a test group (n=33) and an experimental group (n=42). The cows were selected according to their age, live mass and the date of insemination.

In the experimental group were the cows which had to calve in the last 10-day period of December, in January and in February and they were pregnant for 260-275 days up to that time. The experimental animals were given injections of 20 ml of Glutam 1M preparation under skin behind shoulder for three days at a row on the 260^{th} (n=14), 265^{th} (n=14), 270^{th} (n=14) day of pregnancy. In a neurotropic and metabolic Glutam 1M preparation the main active substance is sodium glutaminate, and a secondary one is a physiological salt solution. The preparation was made by "Farmac" enterprise (Kyiv) in accordance with government standards 4881: 2007. The preparation is a transparent liquid without any taste and smell. The test cows were given the injections of a physiological salt solution analogically.

The results of the research. The analysis of the received data showed that in an experimental group the number of cows which calved twice a year increased by 17%. It was made possible due to the reduction of pregnancy period as well as that of the renewal and service periods by 2.7 ($p<0.05$), 8.8, 13.4 days correspondingly as compared to the control. It is necessary to admit that the insemination index and its variability decreased by 22.1% ($p<0.05$) and 18.6%. (table 1)

Thus, the essence of this method lies in giving the injections of neurotropic and metabolic Glutam 1 M preparation at a dose of 20 ml under skin to pregnant cows in the last 10-day period of December, in January and in February on any day of pregnancy within the period of 260-275 days for three days at a row.

The suggested method stipulates for the increase in the number of cows which can calve twice a year, improves the economic efficiency in cattle breeding as it enables to get more calves from one cow per year.

1 Cows' Reproductive Function

Indexes	Test		Experiment	
	X±S.E.	Cv,%	X±S.E.	Cv,%
Number of cows (heads)	33	–	42	–
Number of cows which calved twice (%)	11/ 33,3	–	21/50	–
Duration of pregnancy (days)	281,4±0,90	1,8	278,7±1,00*	1,6
Renewal period (days)	66,0±5,28	38,9	57,2±2,71	30,7
Service period (days)	95,3±6,82	41,6	81,9±6,69	52,9
Insemination index	1,9±,0,17	56,0	1,48±0,090*	37,4

$P<0.05$

A two-times cow's calving stipulates for some morphofunctional tension of the cow's organism. It can have some negative effects on its further reproductive function and milk yielding. In that context we made a comparative analysis of both calves' output and cows' milk yielding within the period of two years (table 2).

2. Milk yielding capacity and the amount of calves received during two years

Index	Group	
	Test (n=33)	Experimental (n=42)
First year (Using Glutam 1M preparation)		
Milk yield per year (kg)	153909	202998
Milk yield per year per cow (kg)	4662,9±91,18	4833,3±68,65
Number of calves per cow	45 / 1,4	67 / 1,6
Second year		
Milk yields per year (kg)	154327	194480
Milk yields per year per cow	4676,6±77,61	4630,5±72,55
Number of calves per cow	40 / 1,2	49 / 1,2

The analysis showed that all cows in a test and in an experimental groups calved the following year, and some of them calved twice. Herewith, when the cows were given an injection of Glutam 1M we received 26.9% more calves than the next year, when the preparation was not given. In the cows of a test group this index increased only by 11% (table 2) .

The preparation Glutam 1m did not have any negative effects on milk yields either. During the year when Glutam 1M was given to cows by injection the milk yields were higher by 4.2% in the cows of a test group, and they remained nearly at the same level in an experimental group, as compared to the year when the preparation was not used. Herewith, the milk yields next year in experimental cows were on the same level as in test cows.

Conclusion.

Giving to the cows a neurotropic and metabolic preparation by injection on any day of pregnancy within 260th-275th days for three days at a row at a dose of 20 ml in the last 10-day period of December, in January and February reduces the pregnancy duration, the renewal and the service periods by 2.7 ($p<0.05$), 8.8 and 13.4 days, as well as reduces the insemination index by 28.4% ($p<0.05$) that results in 17% increase in a number of cows which calved two times a year.

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