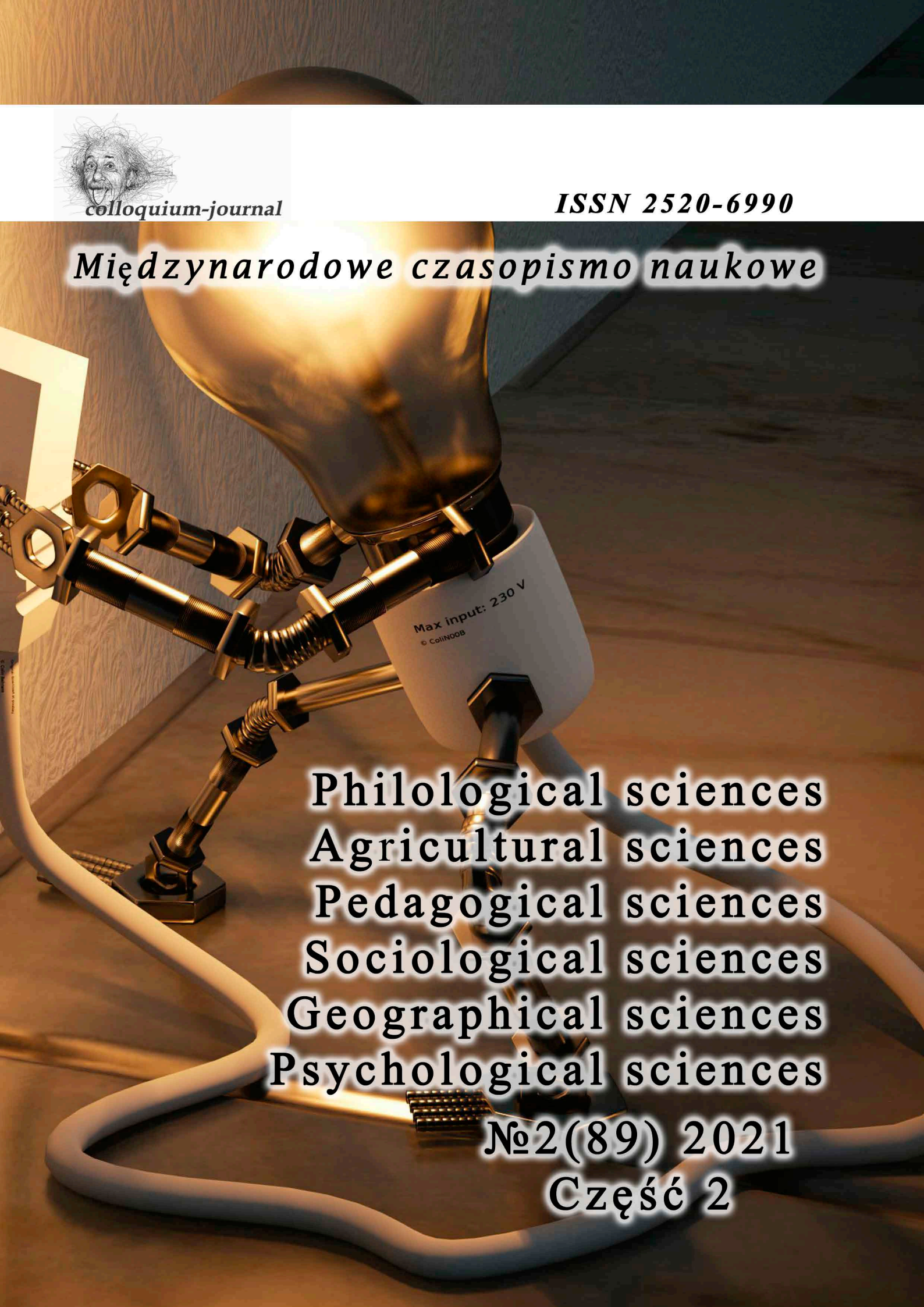

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Описанная система формирования дает возможность создавать скороплодные и высокопродуктивные насаждения. Однако она обладает и существенными недостатками. Формирование кроны в виде веретеновидного куста требует больших затрат высококвалифицированного ручного труда. В связи с этим в современных условиях она не находит широкого производственного распространения. [1, 2, 8]

Для сдерживания силы роста деревьев в высоту применяют формировку по типу «Испанский куст» [3, 4, 5, 6, 7, 8]. При такой формировке появляется большое количество обрастающих побегов, ускоряется вступление в плодоношение на 2-3 года. При такой формировке побеги отгибают в стороны, а штамб обрезают на минимальную высоту. Далее, в течение 3-4 лет проводится обрезка вертикально отрастающих побегов. Такая формировка требует минимальных трудозатрат для поддержания кроны у деревьев в состоянии плодоношения. Во время вступления дерева в плодоношение его рост сокращается. Для улучшения освещенности удаляют затеняющие крону побеги. В последующие годы высоту деревьев удерживают на уровне 2,0 м.

Декоративные формы крон. Плодовые деревья обладают высокой пластичностью и легко поддаются формировке. Во Франции еще около 500 лет назад использовали это для создания так называемых формовых садов. К настоящему времени разработано большое количество самых разнообразных типов крон, имеющих исключительно привлекательный внешний вид. Промышленного значения они не получили, хотя в известной мере послужили прообразом для создания интенсивных типов крон (пальметты, веретеновидный куст). [1, 2, 5, 8]

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Паладійчук О.Р.
PhD, Associate Professor
Vinnitsia National Agrarian University, Soniachna str., 3, Vinnytsia, 21008
ORCID: http://orcid.org/0000-0002-9925-0987
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ПОКРАЩЕННЯ ВІДТВОРЕННЯ КОРІВ МЕТОДОМ АКТИВІЗАЦІЇ ЇХ СТАТЕВОЇ ФУНКЦІЇ

Paladiychuk O.R.
к.с.-г. наук, доцент
Вінницький національний аграрний університет, вул.. Сонячна, 3, Вінниця
ORCID: http://orcid.org/0000-0002-9925-0987

IMPROVEMENT OF COW REPRODUCTION BY ACTIVATION METHOD THEIR SEXUAL FUNCTION

Abstract.

The problem of herd reproduction remains is complex and difficult to solve. There is very often a huge discrepancy between the planned indicators and their implementation in practice, as a result of which the reproduction process of the herd is still ineffective.

In many high-performing cows, the secretion of gonadotropic hormones, especially after calving, is reduced, and the involution of the genitals slows down. All this creates the prerequisites for the occurrence of postpartum diseases, dysfunction of the ovaries and a delay in the first sexual heat. There are frequent cases of termination of the sexual cycle after the manifestation of one or two hunts. The ability to choose the right drug and the optimal

time for its use will lead to success in preventing genital dysfunctions, as well as in regulating the timing of the manifestation of sexual desire and fertilization.

Sex hormones, natural and synthetic, are the largest group of biologically active substances that are widely used to enhance the sexual function of cows. To regulate the timing of the manifestation of sexual desire, gestagens, prostaglandins and gonadotropic hormones are used, often in combination with estrogen.

With the introduction of hormonal drugs to a group of animals, the onset of sexual heat is ensured synchronously in most of them. In this case, less time is required for the manifestation of hunting. More opportunities appear in improving the organization of artificial insemination and reducing the timing of its implementation.

There is a problem of the influence of dietary supplements and hormonal drugs on the general condition of the body, the morphological composition of the blood; development of their doses and regimens for prevention of complications during deep pregnancy; their use in the postpartum period of cows in order to activate sexual function, the successful implementation of artificial insemination and fertilization of cows and heifers.

Анотація.

Проблема відтворення стада залишається складною і важко вирішуваною. Між плановаными показниками і їх реалізацією на практиці дуже часто існує величезна невідповідність, унаслідок чого процес відтворення стада все ще являється неефективним.

У багатьох високопродуктивних корів секреція гонадотропних гормонів, особливо після отелення, пригнічена, сповільнюється інволюція статевих органів. Все це створює передумови до виникнення післяродових захворювань, порушення функції яєчників і затримки першої статевої охоти. Нерідкі випадки припинення статевої циклічності після прояву 1-2 охот. Уміння підібрати відповідний препарат і оптимальний час для його використання зумовить успіх в запобіганні розладам функції статевих органів, а також в регулюванні термінів прояву статевої охоти і запліднення.

Статеві гормони, природні і синтетичні - найбільша група біологічно активних речовин, яка широко використовується в активізації статевої функції корів. Для регулювання термінів прояву статевої охоти застосовують гестагени, простагландини і гонадотропні гормони, незрідка в комбінації з естрогеном.

При введенні гормональних препаратів групі тварин забезпечується настання статевої охоти синхронно у більшості з них. При цьому потрібно менше часу на виявлення охоти. Більше можливостей з'являється для поліпшення організації штучного запліднення і скорочення термінів його проведення.

Існує проблема впливу біологічно активних добавок та гормональних препаратів на загальний стан організму, морфологічний склад крові; розроблення їх доз та схем з проведення профілактики ускладнень в період глибокої тільності; використання їх у післяродовий період корів з метою активізації статевої функції, успішного проведення штучного осіменіння та запліднення корів і телиць.

Ключові слова: *відтворення, еструс, сервіс-період, корови, профілактика, стимуляція, синхронізація, речовини, гормони.*

Keywords: *reproduction, estrus, service period, cows, prevention, stimulation, synchronization, substances, hormone.*

Formulation of the problem. In cattle due to the manifestation of sexual cyclicity throughout the year there is a possibility of widespread use of exogenous hormonal drugs and biologically active substances. Needs and the need to use them arise often. In many high-yielding cows, the secretion of gonadotropic hormones, especially after calving, is suppressed, the involution of the genitals is slowed down. All this creates the preconditions for the emergence of postpartum diseases, ovarian dysfunction and delays in the first sexual hunt. There are often cases of cessation of sexual cycling after the manifestation of one or two hunts or in other periods. The ability to choose the appropriate drug and the optimal time for its use will greatly succeed in preventing disorders of genital function, as well as in regulating the timing of sexual desire and fertilization, if, of course, other circumstances are taken into account (energy balance, animal fatness, endocrine status, etc.) [7].

Analysis of research and publications. The problem of herd reproduction remains complex and difficult to solve. There is often a huge discrepancy between the planned indicators and their implementation in practice, as a result of which the process of herd reproduction is still inefficient [4]. High efficiency of reproduction of a herd allows to increase productivity at the expense of increase of daily dairy productivity of a cow and increase in number of calves; reduce the costs associated with keeping non-lactating cows, loss of productivity due to complicated calving, treatment and insemination of cows, culling of infertile cows and retention of heifers after their onset of physiological maturity; increase the rate of genetic selection due to the culling of cows on the basis of productivity, rather than due to reproductive problems; increase the genetic potential of young heifers - the basis of the future generation of cows in the herd [3].

Thus, regardless of the goals of genetic selection (increasing milk productivity or improving the exterior), a high level of reproduction can accelerate the increase in the genetic potential of the herd. Another positive aspect of the high level of reproduction of the herd is the ability to control the calving of animals during the year. In herds with an intercorporeal period of cows up to 12.5 months, they calve in about the same season. Sometimes it is desirable to evenly calve the herd throughout the year. However, with high prices for dairy products in winter and better quality roughage and succulent feed in the summer from an economic

point of view, it is advisable to calve in the autumn-winter season [1, 2].

Progestogens, prostaglandins and gonadotropic hormones, often in combination with estrogen, are used to regulate the timing of sexual desire (estrus). With the introduction of hormonal drugs to a group of animals - provides the onset of sexual hunting simultaneously (synchronously) in most of them. This requires less time to detect the hunt. More opportunities appear to improve the organization of artificial insemination and reduce the time of its implementation. After fertilization, you can place the animals in one room (pen), provide feeding and maintenance in accordance with the physiological state and then establish qualified control over the course of labor. The season for childbirth can be chosen at will.

In dairy farming, the synchronization of sexual hunting has both advantages and disadvantages. Heifers have more difficult births, which requires careful monitoring during their reception. Because the length of the calving period during fertilization using synchronized sexual hunting is significantly reduced, it is easier to control the course of labor. On the other hand, when milking first-borns it is necessary to make more effort and tension, and it is more difficult to successfully cope with a group of animals [6].

The most common means of regulating the sexual cycle in cattle is prostaglandins. They quickly cause regression of the corpus luteum, ie eliminate the source of progesterone as effectively as its mechanical removal from the ovary by hand through the rectum (enucleation) or surgery. In the absence of progesterone, the growth and maturation of follicles begins and hunting ensues [8].

Corpus luteum enucleation was recommended in cases where the corpus luteum functioned longer than usual in cows or heifers after calving or regular hunting, despite the absence of pregnancy. Enucleation can be successfully replaced by the introduction of PG-F2 alpha or its synthetic analogue cloprostenol. After intramuscular injection of 25 mg of PG-F2 alpha or 120-500 μg of cloprostenol (2 ml of superfan, clatraprostin, estrofan, remofan, estufalan, aniprost, etc.) to cows and heifers on day 5-16 of the sexual cycle there is a regression of yellow body, and after 2-3 days the animals show signs of heat and hunting. Ovulation occurs after 70-96 hours. The percentage of fertile fertilization in stimulated hunting is the same as in natural.

Of the hormones of the hypothalamus, the most widely used synthetic analogues of GnRH (surfagon, condugestran, fertirelin, gonadorelin, etc.). When administered parenterally, they cause the release of LH, the level of which in the peripheral blood increases after 30 minutes and reaches a maximum in 2-3 hours.

Sex hormones, natural and synthetic, represent the largest group of biologically active substances and are widely used in medicine and veterinary medicine [5].

The purpose of research: to improve the reproduction of cows in the herd by activating their sexual function through the use of hormonal and biologically active substances.

Materials and methods of research. Experimental studies were conducted on cows of black-and-white breed on a dairy farm "Lani Vinkovechchyny" vill. Vinkivtsi, Khmelnytsky region.

For experimental studies, 2 groups of cows were selected: experimental and control. The experimental and control groups were formed from 11 cows.

During the study, a daily clinical examination (external and internal) of cows of the experimental and control groups and recorded all physiological changes that occurred in the genitals of animals during this period.

Before using biological regulators of sexual function, it is necessary to master the technique of identifying the three stages and all the phenomena of the stage of estrus of the sexual cycle. The method is based on the results of rectal examination of the internal genitals, which determine the size, consistency, cervical tone, size, location, contractility of the uterine horns, shape, size of the ovaries, the presence, size and consistency of functional structures of the ovaries (follicles and corpora lutea).

Cows of the experimental group in order to increase the overall biological tone and mobilization of the body's defenses used vitamin preparation "Tetravit", which was injected at a dose of 10 ml intramuscularly, three times with an interval of 7 days. Animals of both groups, regardless of the hormonal phase (day) of the sexual cycle was injected with the drug "Estrofan" at a dose of 2 ml intramuscularly (table 1).

Sampling of cows after injection of the drug "Estrofan" of both groups was carried out on the manifestation of clinical signs of the stage of estrus of the sexual cycle and the results of rectal examination, which was conducted in the morning and evening. Cows that did not show the stage of estrus of the sexual cycle were re-injected with the drug "Estrofan" on the 11th day after the first administration of this drug.

During the study period, cows that showed the stage of estrus of the sexual cycle were closely monitored until the manifestation of the phenomenon of sexual hunting. As the cows of the experimental group developed this phenomenon, the drug "Surfagon" was injected intramuscularly at a dose of 5 ml (25 mcg) one hour before their artificial insemination. Artificial insemination of animals of both groups was performed with frozen-thawed semen pre-evaluated for suitability twice with an interval of 12 hours (morning and evening).

Table 1

The scheme of use of drugs during the research period

Indicators		Drugs		
groups	processing day	"Tetravit"	"Estrofan"	"Surfagon"
experimental	1st	10ml	2 ml	
	7th	10ml		
	11th		2 ml	
	14th	10ml		
	1 hour before artificial insemination			5 ml
control	1st		2 ml	
	11th		2 ml	

During the study period, the duration of the period from the first injection of the drug "Estrofan" to the manifestation of cows of both groups of the stage of estrus of the sexual cycle (in hours), the service period and the index of fertilization were taken into account. The account of a clinical condition of animals of experimental and control groups was carried out according to the technique accepted in veterinary practice. Studies of clinical status, morphology and blood biochemistry in cows of the experimental group were conducted before the introduction of the drug "Surfagon" and after 6, 12 and 24 hours after injection of this drug.

Research results and their analysis.

Currently, the intensification of reproduction of cattle is significantly influenced by the use of biotechnological methods, which involve the induction and synchronization of the stage of estrus of the sexual cycle, correction and activation of ovulatory ovarian function, stimulation of gonadal luteogenesis and elimination of functional insufficiency.

It is known that the peak of reactivity of the generative structures of the ovaries to gonadotropins occurs in the middle of the luteal phase of the sexual cycle. It follows that this segment of the sexual cycle (9-12 days) are optimal for stimulating folliculogenesis.

In experiments on the induction and synchronization of the stages of estrus of the sexual cycle in cows used the drug "Estrofan" - a synthetic analogue of prostaglandin F2 alpha.

Surfagon, a synthetic analogue of gonadotropin-releasing hormone, is widely popular among biological regulators of sexual function. Surfagon (and its analogues: dirigestran, fertirelin, gonadorelin, buserilin, luliberin, etc.) when administered parenterally causes the release of luteinizing hormone, the level of which in the peripheral blood increases after 30 minutes and reaches a maximum after 2-3 hours. The release of large amounts of luteinizing hormone stimulates the ovulation process. Based on these data, the experiments used the drug "Surfagon" to stimulate folliculogenesis and ovulatory function of the ovaries, in order to increase fertility.

Studies on the activation of reproductive function of cows in the postpartum period in order to increase the immunobiological resistance of animals and prevent various complications in the reproductive system in the postpartum period were injections of vitamin drug "Tetravit" in a single dose of 10 ml, intramuscularly (table 2).

Cows of the experimental group in addition to "Tetravit" for 14 and 15 days after calving were injected with the drug "FSH-super" with an interval between injections of 12 hours in a single dose of 1 ml (5 units) intramuscularly. On the second day after the start of the drug "FSG-super" was administered to cows of the experimental group once the drug "Estrofan" - a synthetic analogue of prostaglandin, which has a pronounced specific luteolytic effect on the active corpus luteum. The drug "Estrofan" was injected intramuscularly at a dose of 2 ml.

As the cows of the experimental group showed clinical signs of sexual hunting (immobility reflex), the drug "Surfagon" was additionally used at a dose of 5 ml (25 mcg) intramuscularly to induce and synchronize the ovulatory response of the ovaries in more optimal physiological terms.

Table 2

Scheme of treatment with hormonal and biologically active drugs of cows in the postpartum period

Indicators		Doses of drugs						
		days after the calving						1 hour after artificial insemina-tion
groups	drugs	1	8	14		15		
				morn.	even.	morn.	even.	
experimental	"Tetravit"	10ml	10ml					
	"FSH-super"			1 ml	1 ml	1 ml	1 ml	
	"Estrofan"						2 ml	
	"Surfagon"							5 ml
control	"Tetravit"	10ml	10ml					

Studies of clinical status, morphology and biochemistry of the blood were performed before the introduction of the drug "FSH-super", on the first and second days of injection of this drug.

During hormonal treatments, a daily rectal examination of the internal genitals of animal experimental and control groups was performed to study the condition of the uterus, ovaries and education on them (follicles and corpora lutea).

Animals of the experimental and control groups, as they showed sexual desire, were artificially inseminated by the cervical method with rectal fixation of the cervix with disposable sterile instruments twice with an interval of 12 hours.

Injection of the drug "Surfagon" intramuscularly at a dose of 25 mcg per hour before artificial insemination caused an increase in fertility of cows of the experimental group (table 3). This drug stimulates an increase in the concentration of luteinizing hormone in the blood. There is an ovulation of a mature follicle and an exit of a full-fledged ovum in optimum physiological terms at artificial insemination.

Table 3

The results of stimulating the stage of estrus of the sexual cycle and increase fertility of cows when using "Surfagon"

Study time			T (°C)	Frequency (in min.):	
				pulse	respiratory
before introduction preparation		X ± S x	38,5±0,1	60,05+1,14	20,13+0,72**
		Cv	1,39	7,11	14,91
		Lim	39,2-37,8	69-53	24-14
After the injection of the drug, through (hours):	6	X ± S x	38,71+0,13***	62,3+1,4	22,87+0,85**
		Cv	1,23	8,01	15,79
		Lim	39,1-38,0	74-54	24-18
	12	X ± S x	38,2+0,1	61,57+1,3	20,06+0,79
		Cv	1,27	8,71	15,14
		Lim	38,5-38,1	74-56	24-14
	24	X ± S x	38,4+0,1	62,0+1,41	20,91+0,89
		Cv	1,09	8,22	20,01
		Lim	39,1-37,9	74-54	24-14

Note: *** - P≤0,001, ** - P <0,05.

Prior to the introduction of the drug "Surfagon" in experimental animals, the number of pulse beats was 60.05 ± 1.14 per minute. Six hours after injection, the contraction of cardiac systole increased slightly and amounted to 62.3 + 1.4 pulse beats per minute, then no significant changes during the study period.

The frequency of respiratory movements in experimental animals, both before administration and within 24 hours after administration of the drug did not change significantly (see table 4).

The change in the number of leukocytes in the blood characterizes the functional state of the hematopoietic organs, and the presence of leukocytosis indicates an increase in the activity of the leukopoietic apparatus, and leukopenia - a weakening of leukopoiesis. This is the great importance of detecting these changes in the number of leukocytes.

During the study period, some increase in the total number of leukocytes occurred in experimental animals 6 hours after exposure to this drug (12.92 ± 0.4). After 12 hours, the number of white blood cells did not change significantly (12.79 ± 0.44) (table 5). 24 hours after injection, there was a slight decrease in the number of leukocytes, which was 10.21 ± 0.37. Apparently, this is due to the deep physiological, morphological and biochemical processes occurring in females during the period of active sexual desire. It is known that during the active manifestation of clinical signs of sexual hunting in female animals there is hyperfunction of the adrenal glands, which produce more hormones, and they, in turn, affect the function of the cardiovascular system of animals.

The physiological significance of erythrocytes in the body is that they are carriers of hemoglobin, which provides the body with oxygen, carry carbon dioxide from the tissues to the lungs, participate in the regulation of acid-base balance (hemoglobin buffer), transport amino acids to tissues, , are involved in a number of enzymatic processes, as well as in maintaining ionic balance in the blood and tissues. Of the changes in the number of erythrocytes in the blood, more often a decrease in their number - erythrocytopenia (erythropenia, oligocythemia), which occurs in anemia, due to insufficient or defective feeding (lack of protein, vitamin B12, cobalt, iron, copper, etc.), with prolonged and severe intoxication, poisoning by hemolytic poisons, invasive diseases, large blood loss, and others.

Table 5

Morphological composition of blood of cows before and after injection of the drug "Surfagon"

Study time			Erythrocytes (mil./mcl; 10^{12}/l)	Leukocytes (thous./mcl; 10^{9}/l)	Hemoglobin (g,%)
before introduction		X ± S x	5,51 ±0,09	11,41±0,39**	10,21±0,13
		Cv	5,22	19,18	6,01
		Lim	7,1-4,7	14-7,7	11,0-9,0
After the injection of the drug, through (hours):	*6*	X ± S x	5,3±0,11	12,92±0,4	9,92±0,15**
		Cv	10,39	21,21	6,59
		Lim	7,2-4,8	15,3-6,9	10,9-9,1
	12	X ± S x	5,72±0,35	12,79±0,44***	10,51±0,12
		Cv	15,91	20,42	5,55
		Lim	7,3-4,6	15,1-7,1	10,7-9,0
	24	X ± S x	5,41±0,14	10,21 ±0,37	10,42±0,15
		Cv	11,92	21,53	6,26
		Lim	7,2-4,9	14,1-5,8	10,89-9,4

Note: *** - P≤0,001, ** - P <0,05.

After administration of the drug "Surfagon" the total number of red blood cells in the blood of experimental animals during the entire study period was in the lower limits of physiological norm and did not undergo significant changes. Determination of hemoglobin in the blood of animals is also important. In clinical practice, a decrease in the content of hemoglobin in the blood is more often observed - oligochromemia, which can occur in anemia, iron deficiency, vitamin B12 and folic acid, hemolysis of erythrocytes, depletion, and others. An increase in the amount of hemoglobin - hyperchromemia occurs with increased sweating, the formation of transudates and exudates, and others. During the study period, deviations in the concentration of hemoglobin in erythrocytes from the physiological norm were not observed in experimental animals after administration of the drug.

The results of clinical and hematological blood tests before the introduction of the drug "Surfagon" and 6, 12 and 24 hours after injection convincingly showed the absence of any physiological abnormalities in the body of experimental animals under the influence of this drug.

Conclusions: 1. Tested on a dairy farm farms "Estrofan" and "Tetravit" in combination with other drugs are effective means of synchronization and stimulation of the stage of estrus of the sexual cycle in cows. The obtained results are in full agreement with the literature data on this issue.

2. Injections of drugs "FSH-super" in a single dose of 5 UNITS with an interval between injections of 12 hours on 14 and 15 days after calving, "Estrofan" in a dose of 2 ml on the 15th day after calving, "Surfagon" in a dose of 25 mcg per hour before artificial insemination and "Tetravit" in a dose of 10 ml once in a complex induced optimal ovulatory response of ovarian cows, thus there was an activation of sexual function in the optimal physiological time after calving.

3. Injection of the drug "Surfagon" an hour before artificial insemination at a dose of 5 ml increased the fertility of cows, had no negative effect on the general clinical condition of the body and blood morphology of animals.

4. The use of cows of the experimental group of drugs "Estrofan" and "Surfagon" causes a reduction in the service period by 16.46 days and a fertilization index of 0.7 compared with cows in the control group.

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Ткаченко М.А.,
Волкова А.С.,
Гненный Е.Ю.,
Вусик А.С.,
Семенов В.А.
Студенты 1 курса напр. «Агрономия»
КубГАУ им И.Т.Трубилина

ДИНАМИКА ИЗМЕНЕНИЯ ПОСЕВНЫХ ПЛОЩАДЕЙ В РОССИИ НЕКОТОРЫХ ХЛЕБНЫХ ЗЕРНОВЫХ КУЛЬТУР

Tkachenko M.A.,
Volkova A.S.,
Gnenny E.Yu.,
Vusik A.S.,
Semenov V.A.
1st year students eg. "Agronomy"
KubSAU named after I.T. Trubilin

DYNAMICS OF CROP AREAS IN RUSSIA OF SOME BREAD GRAIN CROPS

Аннотация.
В статье приводятся обобщенные данные посевных площадей и урожайности некоторых зерновым культур, возделываемых на территории РФ.

Abstract.
The article presents generalized data on the acreage and yield of some grain crops cultivated in the territory of the Russian Federation.

Ключевые слова: *зерновые культуры, посевная площадь, урожайность, структура посевных площадей, пшеница, кукуруза, рожь, ячмень, рис.*

Keywords: *cereals, planting area, yield, planting structure, wheat, corn, rye, barley, rice.*

Введение. Основой производства продовольственных культур в мире является зерновое хозяйство. Оно не только обеспечивает население хлебом, но и определяет направление развития животноводства. Пшеница, рис, кукуруза, ячмень, просо, сорго, овес, рожь и др. являются важным сырьем для многих отраслей пищевой промышленности. Зерновые культуры занимают почти половину обрабатываемых земель. Общий годовой сбор зерна в мире приближается к 2 млрд тонн. Районы выращивания «трех мировых хлебов» – пшеницы, риса, кукурузы – фактически совпадают с наиболее густо заселенными регионами Земли. Уровень развития и специализация зернового хозяйства заметно отличаются в различных частях земного шара. Природные условия умеренных и субтропических поясов, прежде всего, благоприятны для выращивания пшеницы. По площади посевов эта культура занимает первое место среди всех остальных зерновых [1,2].

Результаты и их обсуждение.

Сельское хозяйство является одним из важнейших составляющих современного мира. Количество получаемой нами продукции обуславливается потенциальной урожайностью культур, применяемой агротехникой, а также занимаемой под возделывание площадью. На рисунке 1 представлена динамика изменения посевных площадей в годы исследования.

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