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The prevention of infertility of mares

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In the article it is noted that when the age of physiological maturity is reached, most of mares do not go hunting because of genital infantilism. The authors' studies showed that in the group where the repair filly had a systematic communication with the vasectomized stallions at 36 months of age, the reproductive apparatus was well developed, there were no signs of genital infantilism. All mares were found at the age of 36–37 months, and they became foal, at the mares of the control group at the indicated age the sexual cycles did not appear regularly, signs of genital infantilism were noted. The authors note that the vasectomized stallion provides, normal development of the reproductive sexual system of the repair mares, the full formation and manifestation of sexual cycles. The use of vasectomized stallions allows for an early effective prevention of genital infantilism and infertility in repair mares. Dosed communication of fillies with vasectomized colts and sterile coitus during sexual development promoted the physiological development of the genitals and the full manifestation of the sexual cycle.

Key words: vasectomized stallions, repair mares, sexual cycle, genital infantilism, coitus.

Introduction

Horse breeding in Kazakhstan is developing at a good pace. The pedigree qualities of horses are increased by importing highly productive horses from abroad and skillfully conducting breeding works (Dzhulanov et al., 2010).

The importation of pedigree horses into the country pursues the goal of their participation in sports and, after the completion of the sports career – the acquisition of an offspring that are not inferior to their parents' sports careers. These works require skilled work of veterinary specialists and close attention to the reproductive function of mares (Sevast'janova et al., 1997; Jatusevich et al., 2002).

The data of scientists and practitioners testify that in many horse farms the reproduction of horses is unsatisfactorily organized, and the fillies intended for repair are generally not inseminated at the age of more

than three to five years (Fedorov et al., 1996; Jatusevich et al., 2002).

According to a number of researchers, more than 15% of mares drop out of the contingent every year for various reasons (diseases, death, sale to other farms or exchange, transfer to other groups, etc.). Vacated places should be replenished with young animals, most of which have no sexual cycles timely and accordingly not fertilized (Bajmuhambetova, 1990; Dzhulanov et al., 2011).

Although much attention is paid to this problem by scientists and practitioners, however, this problem is solved in different ways and little attention is paid to the physiological principles of the prevention of infertility. Given the theoretical and practical significance of this issue, we conducted a series of studies to study the effect of physiological stimulation of the filly, starting at the age of 20 months and older than the coevals.

Material and methods

For the experiment, vigorous vasectomized stallions older than 20 months of age were used. This work was carried out in the period 2016–2018. In determining the influence of vasectomized stallions on the development of the genitals of young mares, we formed 2 groups of fillies 20 months of age and older.

The animals of the first group (24 heads) for physiological stimulation were allowed daily-vasectomized stallions-coevals every 2 hours after 2 hours after feeding, the second group (13 heads) served as a control. Control filly had no contact with males before physiological maturity.

In carrying out these studies, we studied the degree of development of the sexual apparatus, the manifestations of the sexual cycles, the actual onset of physiological maturity, the manifestation of infantilism, fertilization in the first and subsequent cycles, the course of pregnancy, childbirth and the postpartum period in experimental and control animals.

Results and discussion

Our observations showed that during the period of communication the stallions sniffed the area of the croup, the labia, the inguinal area of the filly, and mounted. At the same time, the filly also sought for stallions, showed a certain interest in them and did not resist attempts at the cage, allowed the mounting and coitus. Such mutual stimulation of animals produced a vivid manifestation of estrus, under which the active moistening of the labia, the vestibule of the vagina and the vagina, the blinking of the labia, and the flow of mucus from the genital cleft occurred.

An analysis of the results of our studies showed that in mares of experimental group in training and racetrack

testing in the breeding season, there were 2–4 sexual cycles (an average of 3.6 ± 0.21). In the case of mares that did not had sexual contact with the stallions, the sexual cycles did not appear at all or manifested from 1 to 2 sexual cycles (an average of 1.6 ± 0.21). The difference in the existing indicators was reliable ($P < 0.01$). Consequently, a significant manifestation of the sexual cycles in the breeding season in the experimental group is apparently due to the fact that the coitus with the vasectomized stallion positively influenced not only the nervous system, but also the functional activity of the ovaries.

Our studies show that in the case of fillies that communicated with vasectomized stallions at the age of 20 months, the organs of the reproductive system were already well developed by the age of three. So, with palpation of the ovaries they were 2.5×4 cm in size, the follicle was clearly felt, sometimes the yellow body. The uterine divisions were well developed, their rigidity was clearly expressed.

As can be seen from Table 1, the dosed communication of mares with vasectomized stallions, during sexual development, accelerated the development of sexual function. The physiological maturity of repair fillies who had a sterile sexual contact with vasectomized stallions occurred at the age of 37 months. Sexual cycles of these fillies manifested themselves synchronously and fully.

Our research indicates that at the age of 36 months, physiological maturity occurred in 38.4% of the control group's fillies. While in the experimental group at this age, physiological maturity came in 87.5% of the fillies.

Consequently, at the age of 3 years, physiological maturity occurred in 100% of the mares of the experimental group, while in the control group this indicator was 38.5%.

Table 1
Terms of the onset of physiological maturity

Age, month.	Experienced group, n = 24		Control group, n = 13	
	qty.	%	qty.	%
34	6	25.0 ± 2.18 $P < 0.001$	1	7.69 ± 1.35
35	7	29.1 ± 2.56 $P < 0.001$	2	15.38 ± 1.60
36	8	33.3 ± 2.24 $P < 0.05$	2	15.38 ± 1.80
37	3	12.5 ± 0.68	3	23.0 ± 1.80
38 and older	-	-	5	38.5 ± 1.95

By the age of 37 months, physiological maturity occurred in the remaining fillies of the experimental group ($12.5 \pm 0.68\%$). In these terms, physiological maturity occurred in $23.0 \pm 1.80\%$ of the control group mares.

At the age of 38 months. and older physiological maturity occurred in 38.5% of the animals in the control group. In 14.3% of the fillies of this group we observed genital infantilism.

Thus, in the animals of the control group at the age of three years, the genitalia was less developed than in the animals of the experimental group. At palpation, the uterine sections were not clearly expressed, and their contractile function was poorly expressed. The ovaries were 2.5×3.5 cm in size. In such mares did not always palpates the follicle and the yellow body.

Our analysis of the manifestation of sex cycle phenomena indicated that the dosed communication of

fillies with vasectomized stallions and sterile coitus positively affect the development of the sexual cycle and the signs of sexual phenomena at the onset of physiological maturity (Table 2). Thus, at the onset of the

physiological maturity of the animals of the experimental group, sexual stimulation demonstrated itself in $85.7 \pm 1.75\%$, in the testicle in $95.2 \pm 1.47\%$, in sexual hunting in 100%, in ovulation in $95.2 \pm 1.47\%$.

Table 2

Analysis of the manifestation of sexual cycle phenomems when physiological maturity is reached

Sexual cycle phenomems	Experienced group, n = 21		Control group, n = 5	
	quantity	%	quantity	%
Sexual arousal	18	85.7 ± 1.75 P < 0.001	3	60.0 ± 1.27
Estrus	20	95.2 ± 1.47 P < 0.001	3	60.0 ± 1.27
Sexual hunting	21	100.0	4	80.0 ± 1.42
Ovulation	20	95.2 ± 1.47 P < 0.001	3	60.0 ± 1.27

In the animals of the control group, these phenomems were manifested less often during these periods. Thus, sexual excitation was observed in $60.0 \pm 1.27\%$ of the fillies, which was 25.7% less than in the experimental group (P < 0.001). Estrus was observed in $60.0 \pm 1.27\%$ of the fillies, which was also significantly less than in the experimental group (P < 0.001). Sexual hunting and ovulation were also significantly less, $80.0 \pm 1.42\%$ (P < 0.001) and $60.0 \pm 1.27\%$ (P < 0.001), respectively.

During the period of the experiments, we observed that in most cases, before the onset of physiological maturity, the sexual cycles were inferior and asynchronous. By the onset of physiological maturity the phenomena of the sexual cycle manifested themselves more clearly, the sexual cycles became more valuable, and asynchronous sexual cycles were registered less and less. Thus, in the experimental group, asynchronous sexual cycles were observed in 11.6% of animals with a duration of 6–9 days, whereas in the control group, the sexual cycles were asynchronous with a duration of 16–39 days in 23.8% of the fillies.

Our observations showed that in the animals of the control group, the estrus was manifested as a slight discharge from the genital gaps. It was noted as a small accumulation at the bottom of the vagina. At the same time, minor redness and slight puffiness, uniformity of moisturizing the mucous vestibule and vagina.

Therefore, on the basis of the data, it can be noted that dosed communication of repair fillies with vasectomized stallions and sterile coitus against a background of full, balanced feeding, proper maintenance and exploitation during sexual development stimulate the development of the genitals, activate their functional state, i.e. Contribute to a more rapid development of sexual function, increasing the usefulness of sexual cycles, contributing to the timely ovulation of ripening follicles.

Further our studies showed that in physiologically mature fillies the duration of the sexual cycles is 18.7 ± 0.23 – 21.6 ± 0.44 days. Moreover, the ways of preparing repair filly for reproduction to a certain extent influenced the duration of the sexual cycle. Thus, in animals of the experimental group, the duration of the sexual cycle was 2.9 days shorter than the control ones.

We found that in mares that had the opportunity to communicate with vasectomized stallions and sterile coitus, at the onset of physiological maturity, 27.6% of full sexual cycles were noted more than in the control group. In all likelihood, this indicates that sexual intercourse of animals in the development of sexual function shortens the duration of the sexual cycle, provides a full manifestation of it, positively affects the course and timing of the onset of physiological maturity.

Sexual intercourse of repair mares with vasectomized stallions positively influenced the timing of mating and fertilization. So, the mating of repair fillies of the experimental group was mainly (95.2%) conducted at age 34–37 months. The age of fertile insemination in the group was 35.9 ± 0.10 months. The mares of the control group were inseminated as the physiological maturity began, which in this group was late and, accordingly, the age of productive insemination in the group was 37.6 ± 0.38 months. The difference between the parameters of the experimental and control groups was significant (P < 0.01).

Thus, in most animals in the control group, the sexual cycles in the breeding season were delayed, asynchronous, which reduced their fertilization. The results of the rectal examination indicated that 23.8% of the repair mares had underdevelopment of various parts of the genital tract (ovaries, uterus, vagina and vulva), which led to infertility and early culling of breeding filly.

Therefore, the data obtained by us testified to the need to use vasectomized stallions in the conditions of horse farms when growing repair mares. In this case, the physiological stimulation of the sexual function of the repair filly should be started from 20 months. age before fruitful insemination, which ensures the normal development of the genital organs, prevents genital infantilism and allows obtaining high fertilization when physiological maturity is reached. Such sexual stimulation was physiological and humane to animals, as we used the natural factor of the animal of the opposite sex.

With physiological stimulation, the filly independently came to the hunt, they had a well expressed locomotor reflex, they independently looked for the male, without the attendance of the attendants, allowed the coitus.

Similarly, with gynecological examinations of such filaments, the rigidity of the uterus was well expressed. At the same time, we observed a good development of exterior data in such fillies.

It should be noted that the stimulating of frequent communication of growing animals, under which there is mutual stimulation sniffing, licking each other, including the external genital organs, breast, coitus with secretions of accessory glands to the genital area of the fillies. Such frequent (with alternating stages of excitation) erotic stimulation of the nervous system and sexual stimulation of the vulva, vagina, clitoris of growing fillies during coitus, orgasm, absorption of secrets of the accessory genital glands of vasectomized stallions in the genital area of repair mares in the complex ensure the full development of the sexual apparatus, breast and exterior.

Conclusions

The use of vasectomized stallions allows for an early effective prevention of genital infantilism and infertility in repair mares.

Dosed communication of fillies with vasectomized colts and sterile coitus during sexual development promoted the physiological development of the genitals and the full manifestation of the sexual cycle.

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