## секція 7. АГРАРНІ НАУКИ ТА ПРОДОВОЛЬСТВО

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## **EFFECTIVENESS OF USING SEXED SPERM FOR DAIRY CATTLE REPRODUCTION**

Herd reproduction is one of the most complex and important processes in breeding work. It is subject to a number of requirements, the fulfillment of which determines the productivity of animals, the duration and intensity of use, and the cost-effectiveness of production [1-3,7]. Complete preservation of young stock is the main task in the field of reproduction. In addition, modern intensive milk production technologies place high demands on the breeding and productive qualities of breeding animals used to reproduce the herd and obtain animals resistant to technological loads [6,8].

Intensive livestock farming involves the annual renewal of the dairy herd with young animals by 25-30%, therefore, science and practice have always faced the task of obtaining the maximum number of heifers in the offspring.

One of the modern methods in reproductive biotechnology used in animal husbandry is the use of sexed sperm. According to scientific data [4,5], the efficiency obtained from the use of this technique is 65-95% of individuals of the desired sex. However, an analysis of the literature shows that this method has both advantages and disadvantages, therefore, the study of the influence of sexed sperm on the reproductive qualities of animals is relevant [9,10].

Sexed sperm is sperm of fertile animals, separated by sex (carrying X or Y chromosome). The invention in the late 1970s of the flow cytometry method for separating living cells through a high-speed sorter was revolutionary in the field of livestock breeding.

To accelerate the repair of the herd and increase the number of highly productive cows in large dairy farms, sexed sperm is used during the first and second insemination of primiparous cows obtained from highly productive mothers. But sexed sperm has one important feature: the concentration of such sperm is ten times lower than normal, and during preparation it is subjected to several stress factors that negatively affect the fertilizing ability of sperm. This includes staining each spermatozoon, laser cytometry during division, cryopreservation and thawing, which ultimately reduces the fertilizing properties and viability of spermatozoa, although sperm from higher-class breeding bulls with high fertilizing ability is used for sexing [5].

With existing methods of insemination in livestock breeding, the fertilization rate of eggs reaches an average of 85%, with fluctuations from 60 to 90%. With these indicators, only 45% (with a single insemination) of inseminated cows bring calves. Taking this into account, the percentage of pregnancy recorded three months after a single insemination, which reaches 55%, is considered a good indicator.

Before insemination of heifers, a comprehensive selection is carried out, which includes several stages of examination and assessment of the physical condition of the animals. Assessment of fatness and measurement of height at the withers (12 months): At this age, the first stage of selection is carried out, where the general physical condition of the heifer, its fatness and development are assessed. The height at the withers is measured - this is an important indicator of the growth of the animal, which allows you to determine whether its reproductive system is sufficiently developed for further insemination. Thus, the process of selecting heifers for insemination with sexed sperm is very meticulous and requires attention to every detail of the animal's physical and reproductive condition. This increases the chances of successful insemination and the birth of healthy offspring [4].

For dairy cattle breeding, the use of sexed semen is becoming increasingly important, as there are several serious problems associated with breeding and increasing the number of dairy cows.

The use of sexed semen, which allows the separation of sperm carrying X or Y chromosomes, has great potential for optimizing the breeding process. However, the main reason for its limited application in practice is the lack of highly qualified specialists in the field of reproduction. Since this method requires precise control, special skills for working with high-tech equipment and knowledge of the reproductive characteristics of animals, its implementation is complex and requires proper training of personnel [10].

In dairy farming, it is important to get more heifers, as they are the basis for further replenishment of the herd, as well as for maintaining high productivity on farms. Ideally, a heifer is obtained from each insemination of a cow, as this allows for highly productive cows in the future. At the same time, the birth of bulls is less profitable for dairy farming, as they are used mainly for meat production, which is less profitable compared to the dairy sector. In the context of intensification of dairy farming, when the task is to increase productivity per cow, and taking into account the reduction in productive longevity of animals, reproductive efficiency becomes critically important. Given that many dairy cows on farms are imported (especially in countries with highly developed dairy farming), their reproductive qualities often turn out to be worse compared to local breeds. This leads to the fact that farms do not receive a sufficient number of replacement heifers, which are necessary for constant replenishment and expansion of the herd.

Replacement heifers are young cows that replace old or unfit for further reproduction in a herd. Insufficient production of these heifers leads to problems with replenishment of the herd and a decrease in overall farm productivity. In view of this, the use of sexed semen becomes a profitable option, since it can significantly increase the probability of giving birth to heifers.

**Conclusions:** The introduction of sexed sperm insemination allows to significantly increase the efficiency of dairy cattle breeding, since this method allows to precisely control the sex of the offspring. This is especially important in conditions when it is necessary to quickly renew and expand the herd at the expense of heifers. The use of sexed sperm helps to solve the problem of insufficient replenishment of the herd with replacement heifers, and therefore, to maintain or even increase the productivity of the dairy farm.

Thus, sexed sperm is an important modern tool in reproductive biotechnology, which contributes to the improvement of reproductive processes in dairy cattle breeding, and its widespread use is the optimal solution for solving the problem of insufficient heifers and herd renewal. This allows to significantly improve the efficiency of dairy production in conditions of modern cattle breeding.

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