S. O. Sidashova, V. F. Stahovski, S. I. Kovtun. Embryo yield of cows-donors and functional asymmetry of the ovaries

In recent years, experiments aimed at studying the structural asymmetry of paired organs have been conducted increasingly in veterinary medicine. The main factor, which prompted this interest, was extensive use of reproductive biotechnology methods to solve the problems of infertility. In experiments on laboratory animals and in clinical medicine, several authors have found that the nature of pathological processes in paired organs had some differences. Parameters of species functional asymmetry at the level of systems and organs are considered in terms of enantiomorphousness as a trait of adaptive evolution. The study of structural features of physiological and pathological processes in paired gonads of cows will increase the efficiency of biotechnological methods of folliculogenesis stimulation and production of more viable eggs. On the other side, it will reduce the cost of expensive drugs and working time due to more efficient pre-selection of animals for producing embryos.

The aim of the research was to study structure and pattern of functional asymmetry of ovaries of high-producing cows and its influence on the level of quality embryos formation.

Material and methods of research. The researches were carried out during 2011-2012 at two dairy breeding farms – "Agro-Soyuz" JSC (Dnipropetrovsk region) and "RVD-Agro" PE (Cherkasy region). Two groups of high-producing cows were formed of milking breeding stock, yields of which during the best lactation exceeded the average of the herd by 20-60%

The animals were tested during the phased comprehensive research on suitability to removing embryos from them and use of the selected cows in the group of regular donors of embryos, in accordance with applicable requirements of embryo transplantation technology for cattle. During the selection and preparation of cows-donors, washing embryos and their morphological evaluation, we simultaneously performed collecting and analysing data on the activity of functional entities of the left and the right ovaries during luteal phase by palpation according to the advanced approaches. The comparison was performed during cows' induced cycles using injections of synthetic analogues of F2α prostaglandin on standard procedures and after hormonally induced polyovulation in donors using follicle stimulating hormone drugs and on the standard and prolonged procedures.

Results. Pattern of relationship between functional asymmetry of ovaries of high-producing cows-donors and their level of embryo yield was found. Palpation revealed that at cows with sufficient technology and high embryo yield after hormonally induced superovulation, ratio of the number of corpora luteal of the left ovary to the right had a tendency to approach the universal proportion of 38%:62% which is typical for luteogenes of cows in the induced and spontaneous cycles. In group of cows with low yields of high-quality embryos, the ratio of ovarian corpora luteal L: R was significantly different. The observed indicator of functional ovarian asymmetry needs to be researched more and it can be used as a criterion for resource-raising effect at selection of stable donors of embryos at high-yielding herds in the

future. The significant change of functional asymmetry of donors-cows' ovaries after hormone stimulation of polyovulation was shown, including the found phenomenon of inversion of dominant activity of gonads. It was experimentally stated that the high level of producing qualitative embryos for transplantation (9,50-9,86 per washing) was characterized for the cows with sufficient functional asymmetry of ovaries after polyovulation.

Conclusions. Based on the fact that high-quality embryos from high-producing cows of different breeds will have breeding, biological and economic values in the world market of genetic resources in the next years, it is necessary to step up scientific research to study the patterns of functional asymmetry of the cows' reproductive system as one of important biological factors influencing on effectiveness of embryo transplantation technology.

Keywords: **cow-donor of embryos, embryo yield of cows, transrectal palpation, ovaries, corpus luteum, structural functional asymmetry**