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POSSIBILITIES OF ULTRASOUND GUIDED OVUM PICK-UP (OPU) FOR SUBSTITUTION OF HORMONAL SUPEROVULATION IN BOVINE EMBRYO PRODUCTION

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This review article has intention to consider preferences of using Ovum Pick-Up technique for collection of bovine oocytes, needful for *In-vitro* production of embryos, in comparison of conventional MOET program or IVF from slaughterhouse-derived ovaries.

Although the first Embryo Transfer in cows has been performed 65 years ago the Bovine ET Industry has undergone a vigorous expansion in the last three decades. Every year, more than 500,000 bovine embryos have been recovered from donor cows and transferred into recipients, worldwide. Standard hormonal induction of multiple ovulation by exogenous gonadotropins such as eCG (Equine chorionic gonadotropin) or hMG (human menopausal gonadotropin) has been replaced nowadays by purified pituitary extracts (porcine, ovine, caprine and most recently recombinant bovine FSH). Great variation in donor's response to this treatment (in average 5-6 transferable embryos) was the reason for stagnation of classical MOET and initiating of *in vitro* producing of embryos (IVP). In addition to oocytes collection by puncturing ovaries obtained from slaughtered animals, ultrasound-guided transvaginal follicle aspiration in living donor cows has been developed. This is a relatively simply and repeatable technique for recovery of cumulus-oocyte complexes (COCs) and could be performed once or twice a week for several months period. It is possible to carry out on donors with or without fertility problems such as adhesions, cystic ovaries or low production rates in MOET programs; as well as in pregnant cows and prepubertal heifers. Thus, if every segment of the OPU/IVP procedure is performed on the best way, about 100 to 120 embryos can be produced per cow per year (European breeds) and to obtain 50-60 calves after transfer into recipients. Treatment of donors by gonadotropins in not required, and this is reason for applicability on organic/biological farming. Furthermore, Ovum Pick-Up is considered to be a mildly invasive technique, which does not appear to interfere with subsequent reproductive ability or regular endocrine pattern, as well as animal welfare standards.

In Macedonia, the embryo production by MOET have been introduced in 1989 (cattle), 1990 (sheep), and 1991 (goats), following establishment of IVP laboratory in 1993 and upgraded with equipment for ultrasound guided OPU in 1998. The first calf produced from an *in vitro* fertilized frozen-thawed embryo, was born in 1997. Recently, our research activities are extend to the investigation of follicular fluid composition for detecting factors which might have influence on oocytes maturation and follicular dynamics during estrus synchronization protocols, such as PUFA (polyunsaturated acids), NEFA (non-esterified fatty acids), IGF1 (insulin-like growth factor 1), steroid hormones etc.

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