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# EMBRYOTECHNOLOGY



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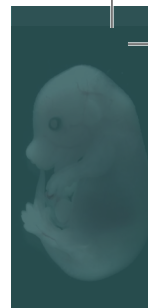
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# INTRODUCTION

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The development and application of the latest knowledge in the field of biological sciences has been strongly associated with the development of genetic technologies aimed at the identification and modification of the genome and genetic basis of biological processes in livestock animals. In a direct context, it can be stated that the irreplaceable place in the mentioned area belongs also to embryo technologies, which represent a prospectively developing field of science and research, which contributes significantly to the efficiency of animal production and, in particular, to the area called "biomedicine". Whatever the studies and discoveries related to embryo technology are various, however their common feature is that they ultimately lead to the therapy and improvement of the quality of human life. Although the results of experimental embryology, obtained from study on experimental animals, are being transferred to human development with great care, their importance is constantly increasing.

The content focus of the publication is based on the assumption of wider theoretical knowledge. In the first chapter, the authors present a brief characterization and definition of embryo technologies, the historical moments of first successful applications of biotechnological methods, as well as the latest trends in biotechnology, also referred to as "new biotechnologies".

Subsequent chapters provide detailed descriptions of the production, collection, separation and evaluation of sperm, embryo and stem cell quality. The chapter on gene manipulations (such as chimaera generation, gene transfer – transgenes and, of course, production of genetically identical embryos (i.e. cloning) is described in detail. The next chapters deal with cytogenetics, cryopreservation and the influence of epigenetic factors on the quality of sperm and embryos of farm animals. The chapter on the conditions of isolation, detection and prospective use of embryonic and somatic stem cells, as well as the chapter on embryo technology application in practice are presented in a proper form.

This university textbook is designed especially for students educated in the study program "Biotechnology" or "Applied biology" but may also be useful to the public community to help in understanding some of the principles of biotechnological methods at the embryonal, spermatozoa and the stem cell level.

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