



## *In Vitro* Embryo Production and Animal Breeding: Where to?

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Decade after a decade of exciting discoveries in the fields of *in vitro* embryo production (IVEP) and animal breeding, the situation has changed, yet the goal of these two fields remains elusive in many research programs around the world. Research has been done on various procedures and variables, despite current advancement in the outcome, many theoretical schools districts are still striving for further goals.

Through the remarkable progress in all aspects, the IVEP technology was able to overcome many obstacles facing the genetic improvement programs, especially genetic selection, the most important of which is the generation interval. On the other hand, animal breeding sub-branches have made important and articulate achievements related to raising the productive level of animals based on the dissemination of excellent genetic structures. Both branches are related to each other according to a mutual relationship, the science of genetic improvement provides the desired genetic structures, while the technology of IVEP releases superior individuals from those structures based on the paternal and maternal source. Not only that, the IVEP technology provides an unparalleled opportunity in terms of preserving genetic resources and diversity across genetic banks.

According to the deep interdependence relationship between the two branches of IVEP and animal breeding, the trend to obtain individuals with superior productivity led to the support of many programs while it met with some criticism and doubts. As a productive aspect, the dissemination of distinct genotypes desired by breeders is being sought at all times. It means taking advan-

tage of the highly productive individuals whose production period has expired by obtaining their gametes at slaughter and then including those gametes in the embryo production programs. Back to the technology that preceded the technology of IVEP, which is the technology of artificial insemination (AI), the comparison between these two techniques is the secret of the success of farms with large herds. More information and clarifications related to the two technologies are provided to breeders on what is offered and how to apply it. This ability to consider a variety of styles and treat each production goal as an option is key to helping all breeders succeed. In areas where there are many embryo productions options, breeders are free to choose a technology that suits the strengths and goals of their farms. However, the large-herd farms made a set of considerations that are governed by many issues. Perhaps one of the most important considerations that impose itself strongly is the application of AI technology, as it is a low-cost technology on the one hand, and on the other hand, it can be applied to large herds such as those in their farms. Besides, some breeders assert that the technology of IVEP is very expensive and requires complex and precise procedures at the same time, in addition to the presence of qualified experts. This is what we see clearly in many countries that rely mainly on livestock, such as the United State of America and a group of European countries. By differentiating between the research aspect and the marketing aspect, it seems inconsistent. Many breeders wonder about the results of the application of IVEP technology, based on the scarcity of research related to pregnancy and birth rates. Moreover, those interested in technology see a huge dispersion in the rates of pregnancy and birth through related research. More importantly, a complete absence has been observed

in research related to animals resulting from the transfer of in vitro-produced embryos, whether in terms of breeding or productivity.

Despite the massive progress made in the two previous fields, the trade-off remains between the commercial and research fields.

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