A Collaborative Initiative for Laboratory Production of Cattle Embryos in Western Canada

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Improving reproductive efficiency of elite animals will hasten dissemination of their genetics and maximize chances of identifying superior animals by genetic selection. Traditional embryo transfer (ET) is commonly used for producing large number of offspring from superior cattle. Life-time productivity of embryos per donor can be further increased several fold by repeated egg collection (ovum pickup) from live cattle, and in vitro (laboratory) production of embryos using these eggs. This approach has several advantages compared to traditional ET (maximization of genetic combinations, reduction in generation interval, efficient use of sexed semen for sex-specific embryo production, and salvaging genetics of cattle with reduced fertility (due to reproductive problems or terminal diseases). Currently ovum pick up and laboratory production of embryos is not readily available in western Canada. Therefore, we initiated a collaborative project to establish a facility in western Canada for this purpose. Our preliminary results demonstrated that eggs collected from live cattle could be fertilized in vitro and the fertilized eggs could be grown in the laboratory until they reach the blastocyst-stage, at which could be transferred to recipients or frozen for future use. Further studies are aimed to improve efficiency of this procedure and evaluate ability of these in vitro embryos to establish pregnancy and result in birth of live normal calves. The key long-term outcome of this project is establishment of this innovative technique in Alberta in collaboration with cattle producers and embryo transfer practitioners. This project received funding support from ALMA.