

GENETIC ENGINEERING

Canada's livestock production technology has long been recognized as among the most advanced in the world. This has resulted in a high demand for genetically superior Canadian breeding material on international export markets. In particular, Canadian exports of cattle in the form of live animals, semen and frozen embryos and exports of poultry breeding stocks represent export revenue of between \$50 and \$100 million annually. In fact, one of every three Leghorn laying hens in the Western world today is Canadian-bred; and Canadian Holsteins are recognized throughout the world as being among the most productive and efficient milk-producing breeds.

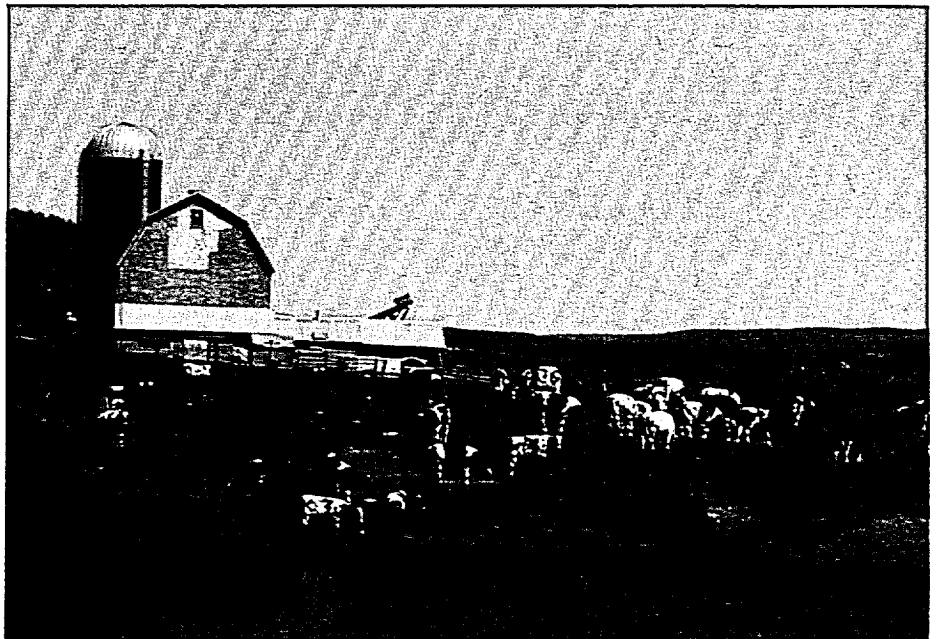
The adaptation and application of modern technological advances to animal production by several private industry concerns in Canada has resulted in the development of highly successful embryo manipulation techniques (superovulation, embryo collection, embryo freezing and splitting, etc.) to supply genetic material to both domestic and foreign markets.

Alberta Livestock Transfers of Calgary, Alberta, is one of the first companies in the world to successfully use embryo manipulation technology in practical industry applications. The company has developed substantial export markets for frozen embryos.

Other Canadian companies successfully using the above techniques for the manipulation of the reproductive process in cattle are **Eastern Breeders** of Kemptville, Ontario; **Western Breeders** of Woodstock, Ontario; and **United Breeders** of Guelph, Ontario.

Superovulation and embryo transfer programs are also successfully applied by Canadian field veterinarians. For example, such cooperative efforts in this direction are commonly undertaken by Québec veterinarians and the **University of Montréal St. Hyacinthe Veterinary College**, St. Hyacinthe, Québec. Currently, the possibilities of further developing this technology and its industrial application are being actively explored.

Research on the manipulation of the reproductive process is now underway at the **University of Calgary, Alberta**, in conjunction with **Alta Genetics (Alberta)**. Research is concentrated on the development of cloning as a method of capitalizing on outstanding animals, as a tool in conventional livestock improvement and to combine desirable traits from other breeds or species in transgenic animals. Similar complementary work is



Genetic engineering is an important complement to conventional livestock improvement techniques.