

company<sup>46</sup>. Half of the alliances were with foreign firms, 33 % from the USA and 13 % from Europe. The top major factors for selecting a foreign partner were credibility, marketing expertise and access to technology.

Industrial biotechnology in Canada is largely made up of small firms. In fact only 20 % of the firms engaged in biotechnology have over 135 employees. Presently there are 13 publicly traded biotech firms in Canada<sup>47</sup>. Some of the largest firms include Allelix Biopharmaceuticals Inc., BioChem Pharma Inc., Biomira Inc., Cangene, Quadra Logic Technologies Inc. and RML Medical Laboratories Inc. Revenues in 1989 reached \$660 million.

A list of firms involved in the commercialization of biotechnology can be found in various federal and provincial publications (43,48,49,50).

## 1. AGRIFOOD

In 1988, agriculture and food production, processing and distribution made 4.5 % of the GDP of Canada, and exports reached \$10.2 billion. Of the 70 companies active in agrifood biotechnology, 39 are involved in improving crop yield and animal production. Average revenues per biotech company for 1992 are \$16.8 million for agriculture and \$2.5 million for food and beverages. Annual sales in the industry for biotech products could rise to \$5 billion in 1992.

A major market potential for advanced bovine and porcine vaccines and other animal health products exists in the US, with smaller markets in Western Europe and Hispanic America. In probiotics the potential market exceeds \$4.4 billion. These market could be readily accessed by Canadian companies with Spanish partners. Other areas of commercial development include, artificial insemination, and cloning, biosensors for food toxins, for example Salmonella, development of fermenters and bioreactors, etc. are being developed by Canadian firms.

A number of firms are active participants in the Transgenic Plant Centre of Saskatoon (a new section of the Plant Biotechnology Institute) assessing the first genetically engineered plants to come out of the laboratory<sup>51</sup>. The following areas of development are pursued by Canadian firms: cereal grain (genetic modification of the freezing tolerance of wheat and rye), and legume grain biotechnology, etc.

Another area of great interest in this context is aquaculture. Canada has the conditions to become one of the world's players in culture-based fisheries.