EQUIPMENT FOR THE FOOD INDUSTRY

CANADIAN PARTNERS FOR GLOBAL MARKETS

- PACKAGING
- PROCESSING
- LABELLING

Canada

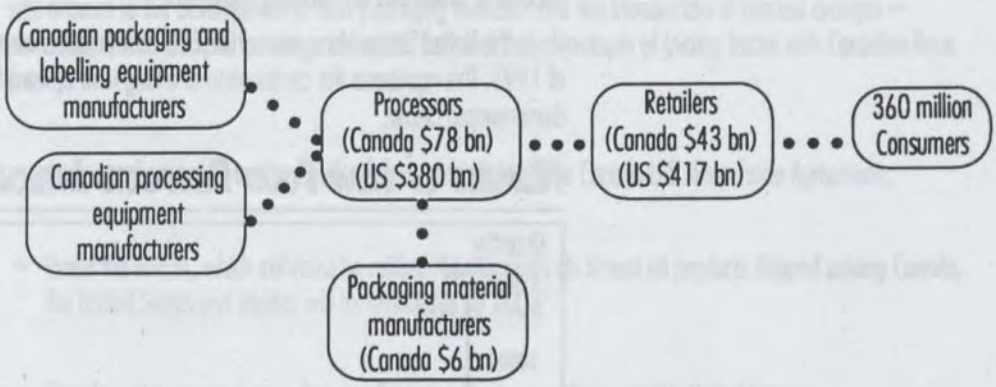
This publication is designed to facilitate and encourage business cooperation between Canadian and foreign firms in the food equipment industry.

Individual profiles of Canadian companies and research institutes, that are seeking collaborative business arrangements with their foreign counterparts, are contained within. The accompanying brochure outlines the reasons why Canadian firms make excellent partners when establishing a business base in rapidly expanding global markets.

Canada is committed to building upon its substantial base of expertise and achievements in the food industry. Our competitive business environment, highly skilled labour force, technologically innovative companies, and world-class research and development infrastructure are some of the key reasons to join forces with Canadian food equipment firms in order to pursue global market opportunities.

THE CANADIAN OPPORTUNITY

Canada's food packaging and processing equipment industries are part of a complex and dynamic supply chain whose ultimate customers represent one of the largest consumer markets in the world - North America. Canada, the United States and Mexico constitute a $460 billion market for foods of all types. The majority of this market is for value-added, processed and packaged food products.



Canadian suppliers of food processing and packaging equipment have the capabilities necessary to satisfy the needs of food processors across North America and abroad. They are uniquely positioned to compete under the Canada-U.S. Free Trade Agreement. As of January 1, 1993, all tariffs on trade in food processing and packaging equipment between the two countries have been eliminated.

The North American Free Trade Agreement (NAFTA) has established the largest free trade zone in the world, since coming into effect on January 1, 1994.

Canadian food packaging and processing equipment manufacturers are well-prepared to meet the demands of the nineties:

- Consumer demands are changing – an aging population, working women and ethnic influences, as well as demands for convenience and freshness – are all factors leading to an increased demand for a diversity of value-added and processed foods.

  Food processors are responding – and equipment suppliers are providing the means. In 1990, over $2 billion was spent in Canada on new buildings, machinery and equipment for the food industry.

- Environmental demands – manufacturers of packaging materials are responding to a demanding Canadian society. Innovative equipment suppliers are meeting the goal of pollution-free packaging.

Canada has responded to the need to reduce the solid waste/landfill problem by adopting a National Packaging Protocol (NAPP). Under NAPP, specific targets for waste management provide for a staged 50 per cent reduction in packaging waste by the year 2000.

NAPP will create investment opportunities across several industry sectors. Packaging material suppliers, packaging designers and food processors will seek innovative and cost-effective ways to reduce packaging. Food equipment manufacturers will benefit.

FOREIGN AFFAIRS AND INTERNATIONAL TRADE CANADA

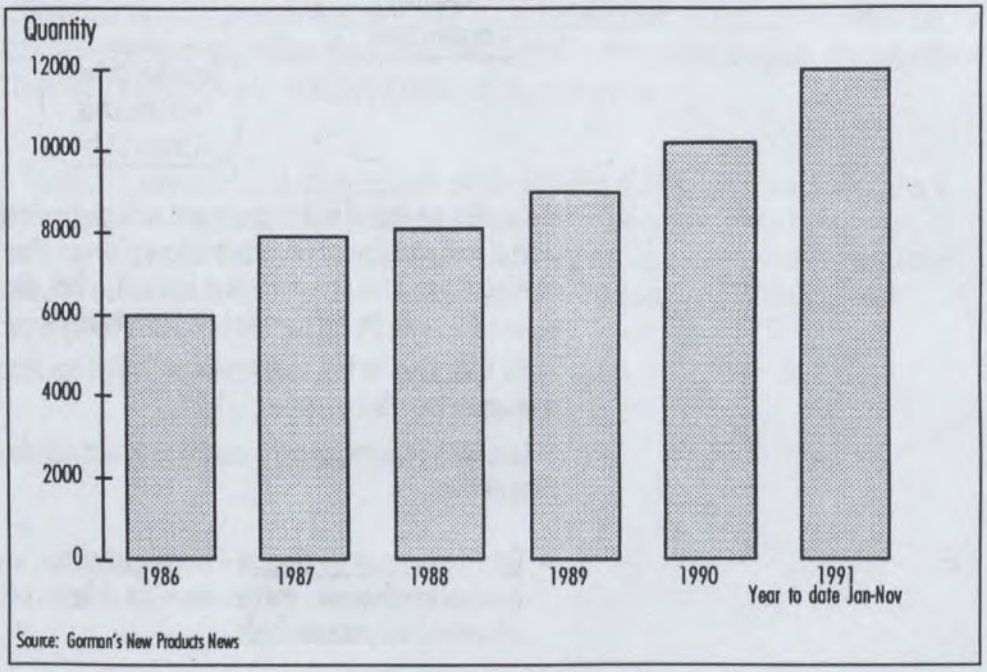
INDUSTRY CANADA

WORLD'S LARGEST MARKET

North America represents the world's largest market for value-added, processed food products. This market is characterized by continuous change and innovation. New foods, in new forms and flavours, as well as changing consumption patterns, require new approaches to food processing and packaging. This translates into unprecedented growth in opportunities for innovative approaches and solutions in the design and manufacture of packaging, processing and labelling equipment.

In the United States alone, almost 12,000 new products were brought to market in the first eleven months of 1991. This represents the continuation of a long-term upward trend in new product introductions as demonstrated below.

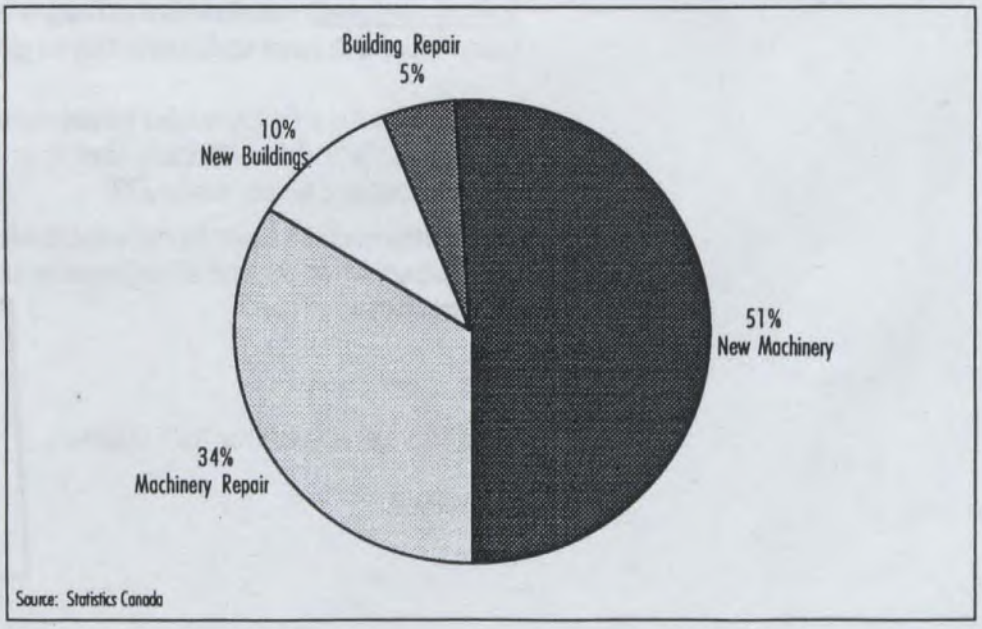
NUMBER OF NEW FOOD PRODUCTS INTRODUCED – U.S.A.



Source: Gorman's New Products News

CANADIAN FOOD INDUSTRY INVESTMENT INTENTIONS

1991 - TOTAL $2 BILLION



Source: Statistics Canada

JOIN FORCES WITH CANADIAN FIRMS

Canada's manufacturers of food processing, packaging and labelling equipment are in a position to make an important contribution to global efforts to use economical, high performance and environmentally benign packaging that will help make a finite supply of food and other necessities support a growing population.

Canadian firms have developed strong linkages with customers located throughout North America. They are well attuned to the development of new packaging materials and the introduction of process changes – particularly in the food and beverage industries. Some of the advantages of joining forces with Canadian firms are:

- Access to the North American market guaranteed through the Canada-U.S. Free Trade Agreement;
- Under the NAFTA, which still must be ratified, border tariffs on almost all products shipped among Canada, the United States and Mexico will be eliminated by 2003;
- Canada ranks among the top five suppliers of packaging machinery to the United States;
- Up to 80 per cent of sales exported to the United States;
- World-class capability in custom-engineered and manufactured machines for niche markets;
- Ability and flexibility to respond quickly to changing market demands; and
- Industry, university and government partnership for R&D and collaboration.

A WIDE RANGE OF OPPORTUNITIES

JOINT VENTURES AND STRATEGIC PARTNERSHIPS

Canadian companies are actively seeking joint ventures and strategic partnerships in order to develop new markets and technologies. What they offer in return can make a world of difference to the success of your business.

DISTRIBUTION RIGHTS

Canadian companies and research groups have developed innovative technology-based products that you can distribute in your home markets.

MARKETING ASSISTANCE

Many Canadian companies are interested in distributing your products in Canada and the United States.

TECHNOLOGY LICENSING

Canadian companies and research groups have many innovative technologies that you can license for profitable re-sale.

CONTRACT RESEARCH

Canadian companies, universities and research groups with considerable "trouble-shooting" experience are available to help you find technical solutions to your development problems.

COLLABORATIVE RESEARCH

Canadian companies, universities and research groups are actively seeking to collaborate in research problem areas that will yield mutual technical advances and commercial benefits.

RESEARCH CONSORTIUM MEMBERSHIPS

By becoming a member of a Canadian research consortium, you can gain privileged access to new technologies.

UNIVERSITY RESEARCH CHAIRS

Canadian universities and research groups offer you the opportunity to send your researchers or employees to Canada for short-term professional development, or for longer-term post-graduate or post-doctoral studies. Such exchanges will provide you with clear insights into both leading-edge and emerging technologies, as well as enhance your researchers' professional networks.

RESEARCH PERSONNEL EXCHANGES

By sponsoring a university research chair, your company can gain valuable access to research results for the next five to ten years.

THE CANADIAN ADVANTAGE

I Technological Innovation

II Globally Oriented Firms

III Attractive Investment Environment

IV World-Class R&D Infrastructure

V Successful Industry – R&D Institute Linkages

VI Government Committed to Industry

Access to leading edge innovative packaging and printing capability, as well as state-of-the-art packaging equipment manufacturing, has played a major role in the success of the President's Choice product line – considered by many to be North America's pre-eminent private label product program - and demonstrated by the many packaging awards garnered over the years.

"We work with many excellent Canadian food processors and packagers to go from concept to finished product - often working against extremely tight deadlines. We are fortunate to have access to many innovative and efficient small to medium-sized Canadian processors who are willing to work with us to meet our quality and economic goals."

Dave Nichol
Former President
Loblaw International Merchants

I TECHNOLOGICAL INNOVATION

ABCO Industries Ltd., of Lunenberg, Nova Scotia produces an award-winning, energy-efficient, heat and hold **vegetable blancher**. Its K Series Blancher consists of separate heat and hold sections. The heat section is non-pressurized – allowing product to be exposed to live steam for much shorter periods of time than other blanchers. In the patented hold section, heat applied to product in the initial stage of blanching is allowed to equalize within the product until the desired core temperature and level of enzyme inactivation are achieved.

Advanced Equipment Inc., of Richmond, British Columbia is the only individual-quick-freeze (IQF) freezer manufacturer in the world that designs and produces 80% of the components used in its products. Advanced Equipment's special **short radius IQF spiral freezer** can compact 6600 lbs./hr. of freezing capacity, into a freezer space occupying only 280 square feet of plant floor area, as opposed to a conventional requirement of 977 square feet. As a result, the system uses 60% less horsepower for fan requirements.

Bevco Conveying Systems, of Surrey, British Columbia introduced a new generation **cooling tunnel** at Canada Safeway's Lucerne Jam Plant in December 1991. Comparison tests against the unit that it replaced showed water consumption was reduced from 100 gallons per minute to 5 gallons per minute.

Schmidt Farms, of Maple Creek, Saskatchewan has designed and manufactures a **flour mill** that utilizes a simple one-step process, as opposed to the 14 actions required in conventional flour milling. Its compact mill produces a fine uniform flour from a variety of grains and legumes. Whole grain is gravity-fed into the hopper and is then forced into the milling chamber by a hydrostatically controlled conveyor. The grain is exposed to micronizers for less than three seconds before it is expelled from the chamber, ready for bagging and use.

"Canadian machinery and equipment manufacturers have adopted technological change, they have embraced quality and they are able to produce products to meet the needs of the global community. They are companies with a vision and a desire to succeed, and their products show it."

Arnold W.D. Garlick, President
Machinery and Equipment
Manufacturers' Association of Canada

CANADIAN FIRMS ARE WORLD-RENOWNED FOR PROBLEM-SOLVING ABILITIES AND PRODUCT MANDATES

The Deam Company Ltd., of Concord, Ontario designs and manufactures automated packaging machinery and material handling systems for the dairy, food, beverage and pharmaceutical industries. Deam **case packers** are considered the standard for the dairy industry in Canada, enjoying virtually 100% of the market for such equipment.

Nordion International Inc., of Kanata, Ontario was the pioneer, and continues to be the world leader in the design, manufacture, installation and servicing of research and commercial **irradiation facilities**. Nordion already commands over half of the world market for irradiators. As of March 1991, Nardion designed and manufactured 87 of the 170 gamma processing facilities around the world. The firm attributes its success to ongoing R&D into new irradiation applications and four decades of experience with more than 1,000 customers in over 100 countries.

The **Bottling Development Division** of Joseph E. Seagram & Sons Ltd., designs, manufactures, markets and installs packaging machines and systems. The firm was the first to introduce **missing container detection** in a case by either capacitive proximities, or triple beam sensing systems.

Stanpac of Smithville, Ontario designs, manufactures and sells foil-laminated closures and **closure applicating equipment**. Approximately 85% of North American dairies that use refillable containers also use Stanpac closures. Approximately 85% of Stanpac production is sold outside of Canada.

Statiflo Inc., of Willowdale, Ontario is the only firm among four worldwide that designs and manufactures **motionless mixers**.

Unitrak Corporation Ltd., of Port Hope, Ontario is the only North American manufacturer of **interlocking bucket conveyor systems**.

II GLOBALLY ORIENTED FIRMS

"We are proactively pursuing alliances with technically-oriented manufacturers abroad – this is the best way to exploit new technologies, markets and opportunities as they evolve worldwide. Experience with a prospective Scandinavian partner may very well demonstrate that both parties can benefit immensely."

Keith Colwell, President
Global Marine Products Ltd.
Dartmouth, Nova Scotia

H.J. Langen & Sons Inc., of Mississauga, Ontario manufactures cartoning and case packing equipment for the packaging industry. The company is proactively pursuing joint ventures in order to remain competitive. A joint venture with a Japanese partner was established November 1st, 1991.

The newly established company – **Langenpac-Kyoto Seisakusho** – manufactures Japanese-designed case packers in Toronto, Ontario, for the North American market. Langen has a 60% interest and the Japanese partner a 40% interest in the joint venture – with Langen providing sales, engineering and manufacturing facilities and know-how.

The technology transfer process, with the Japanese partner's engineering personnel engaged in Canada, is in its final stage. Langenpac-Kyoto Seisakusho has found product acceptance to be extremely high and anticipate gaining a 10% marketshare within five years.

Quadro Engineering Inc., of St. Jacobs, Ontario designs and manufactures an innovative line of reduction (grinding) mills and equipment for fluid handling including mixing, emulsifying and powder dispersion. A British **joint venture** named **Quadro Ytron (UK) Ltd.**, allows Quadro products to be sold internationally. The parties involved have benefited considerably. Quadro acquired the experience and capability of a technically knowledgable "local" person. The relationship has proven to be quite successful for the British counterpart, through increased sales, to the point where the partner now represents Quadro in several countries in continental Europe.

The British partner holds 50 per cent of the joint venture, Quadro 25 per cent and the remaining 25 per cent is held by a German partner. Quadro's long-term approach to, and success with, its business relationships abroad will be applied to its current plans for a strategic alliance with a Japanese and a Mexican partner in areas of complementary equipment.

"On behalf of the JUMEX group of companies, I would like to thank you for the excellent suppart in special packaging machinery and consulting which you have provided us.

To fulfil our future needs in upgrading machinery, as well as new prototypes, we would like to continue using ZEPF (ZEPF Technologies Inc. of Waterloo, Ontario) and look forward to a productive and lasting relationship."

Sr. José Luis Bush, Director
GRUPO JUMEX
Mexico

CANADIAN COMPANIES ARE INTERESTED IN BUSINESS COOPERATION AND INVESTMENT

The Deam Company Ltd., of Concord, Ontario, has developed, over o number of yeors, o good working relotionship with Dupont of Conodo. Dupont morkets o milk pouch filling mochine, primorily for U.S. customers. Deom complements Dupont's line by supplying bagging ond cosing equipment, os well os engineering support to develop loyouts for plont instollotions.

Deom hos olso developed severol creomer cup hondling systems including bog ond box cosers, box loaders ond oll reloted conveyor equipment, with Portion Packoging Ltd., of Conodo. The relotionship hos been successful to the point where Deom is now responsible for complete system instollotion ot end-user sites.

Neptune Dynamics Ltd., of Richmond, British Columbio recently formed o consortium with seven herring roe producers to develop o much-needed outomoted **Roe Herring Opener (RHO)**. Use of the RHO by British Columbio fish processors will cut processing costs, relieve some worker health problems ond leod to more outomotion, ond therefore o better position in the single-morket roe herring industry. A mojor break-through wos the obility to open fish without domoge to the roe.

This combinotion of o morket-driven need ond the ovoilobility of technology to solve on historicol problem, in concert with o consortium opprooch, contributed to the overoll success ond solution to o developmentol undertoking. The some opproach is being used to find o solution to o second opplicotion in the herring roe processing industry – the recycling of sodium chloride brine.

III ATTRACTIVE INVESTMENT ENVIRONMENT

INTERNATIONALLY COMPETITIVE TAX TREATMENT OF R&D

The federal corporate income tax system in Canada provides a number of significant tax incentives for companies conducting intramural R&D. It allows for 100% deduction for current R&D expenditures, as well as for capital expenditures made on R&D machinery and equipment. Buildings for R&D purposes, however, are depreciated on an ordinary basis, applying a 4% declining balance per annum.

Of more significance is Canada's allowance of an investment tax credit on qualifying R&D expenses incurred in Canada. The rate of the credit is 20% of R&D expenditures, except for Atlantic Canada, where it is equal to 30%.

An examination of the **B-indexes*** in the table below shows that the Canadian corporate tax system provides greater overall incentive for companies to engage in R&D than does the tax system of nine other leading industrial countries.

COMPARISON OF THE INTERNATIONAL TAX TREATMENT OF R&D

B-indexes in 10 Countries (1989)

Country	B-index	Rank
Canada	0.657	1
Australia	0.703	2
Korea	0.805	3
France	0.813	4
United States	0.972	5
United Kingdom	1.000	6
Japan	1.003	7
West Germany	1.027	8
Italy	1.033	9
Sweden	1.040	10

* The B-index is the ratio of the present value of project-related before-tax income to the present value of project-related costs at which an R&D project becomes profitable for the firm that undertakes it. The B-index is, therefore, the critical (minimum) benefit-cost ratio. The value of the B-index depends on the tax treatment of R&D. The more favourable its tax treatment of R&D, the lower is a country's B-index.

Source: The Conference Board of Canada
International Competitiveness of Canadian R&D Tax Incentives: An Update (Report 55-90)

"From coast to coast and south to north, we tend to be a nation of tolerant people, friendly and low key...I see this in a kind of Canadian style of management. It turns out that the deans of the Harvard Business School, Stanford Business School and London Business School are all Canadians. It may be coincidence, or perhaps this Canadian style of management makes us particularly good at managing professionals -- not a bad skill in today's world"

Dr. Henry Mintzerg
Professor of Management
McGill University, Montreal

A WELL-EDUCATED WORKFORCE TO MEET THE NEEDS OF BUSINESS

The Canadian post-secondary educational system is world renowned for its ability to graduate highly-skilled and trained individuals to meet the increasingly complex demands of today's competitive business environment.

UNIVERSITY GRADUATES – 1989

Discipline	B.Sc./B.Eng.	M.Sc./M.Eng./PhD
Computer Science & Mathematics	4,618	697
Engineering & Applied Sciences	7,077	1,890
Agriculture and Biological Sciences	7,282	1,145

Discipline	Bachelors & first professional degree
Business, Management and Commerce	13,263

COMMUNITY COLLEGE GRADUATES – 1989

Discipline	Diploma
Computer Science & Mathematics	3,092
Engineering Technologies	8,955
Management & Administration	9,037

Source: Statistics Canada
Education in Canada, A Statistical Review for 1989-90

"For companies to attain world markets and become leaders in their field they must have skill depth within the organization. This is accomplished through on-going cross-training. Zepf Technologies' craftsmen are competent in many skills. This interfacing of separate skills develops the individual into the super-service employee - full of self-confidence and capable of representing his firm in many areas. Gone are the days of focused job responsibilities. Our employees are educated in a multitude of skills and product lines, as well as the company itself. Only when staff are trained to this level can innovation and customer service truly reach the expectations of the world market."

Larry Zepf, Chief Executive Officer
Zepf Technologies Inc.
Waterloo, Ontario

IV WORLD-CLASS R&D INFRASTRUCTURE

"I am encouraging linkages or partnerships between research branch establishments, universities, provincial pilot plants and private-sector food research laboratories which share common interests and have complementary expertise wherever possible."

Dr. Art Olson
Assistant Deputy Minister
Research Branch
Agriculture Canada

THE FOOD NETWORK – A CANADIAN CONCEPT

Canada's Food Network assists in the development of strategic initiatives and facilitates proprietary research arrangements throughout Canada. This unique concept is targeted to provide maximum benefit to the food processing sector by minimizing the resource input through the creation of inter-agency, multi-disciplinary research teams.

Universities involved in the Food Network include:

University of Alberta, Edmonton
University of Manitoba, Winnipeg
University of Toronto, Toronto, Ontario
Laval University, Sainte-Foy, Québec
University of Guelph, Guelph, Ontario
University of British Columbia, Vancouver
University of Saskatchewan, Saskatoon
Acadia University, Wolfville, Nova Scotia
Memorial University, St. John's, Newfoundland
McGill University - MacDonald College, Montréal, Québec
Technical University of Nova Scotia, Halifax, Nova Scotia

Other network participants include Agriculture Canada's food research centres at:

Kentville, Nova Scotia
St-Jean-sur-Richelieu, Québec
Morden, Manitoba
Lacombe, Alberta
Agassiz, British Columbia
St-Hyacinthe, Québec
Ottawa, Ontario
Winnipeg, Manitoba
Summerland, British Columbia

Provincial research facilities involved in the Food Network include:

Alberta Agriculture Food Processing Development, Leduc
Alberta Agriculture Laboratory Services Branch, Edmonton
National Agri-Food Technology Centre, Portage la Prairie, Manitoba
Ontario Ministry of Agriculture and Food's Vineland Research Station
British Columbia Food Technology Centre, Vancouver
POS (Protein, Oil, Starch) Pilot Plant Corporation, Saskatoon, Saskatchewan
Canadian Institute of Fisheries Technology, Halifax, Nova Scotia
Prince Edward Island Food Technology Centre, Charlottetown, Prince Edward Island

FOOD RESEARCH AND DEVELOPMENT CENTRE - ST- HYACINTHE

Agriculture Conodo's Food Reseorch ond Development Centre ot St-Hyocinthe, Québec works closely with the food ond beveroge monufocturing sector. This world-closs focility is unique in North Americo, in terms of its mondote ond its relotionship with industry. By collooroting with representotives of the food industry on o doily basis, the Centre hos mode "portnership" its motto.

The Centre's mechonisms for consultotion ond problem shoring enoble it to ploy o unique role os o mojor portner in the food sector. By shoring resources, the Centre ond the industry con meet the technological ond business chollenges which confront them.

All projects completed ot the Centre hove been oimed ot improved product quolity, technological innovotion or greoter competitiveness, which dearly shows the importonce of these three foctors in business success. Projects moy entoil investments, export soles, import replocement, enhonced volue of ogriculturol products ond by-products, technological odvonces, energy conservotion ond improved product quolity.

In the Food Preservotion Technology Section, researchers study food spoilage phenomeno, especiolly in fresh fruits ond vegetobles, ond the technicol meons of controlling them. The group is involved in work on prepockoged products for wholesole ond retoil distributian thot ore profitoble for the industry. A mojor port of the section's octivities ore olso devoted to rigid pockoge ond flexible film testing, ond food-pockoge system modelling.

UNIVERSITY OF GUELPH

"There must be a strong influence of forefront research activity in the way we educate ourselves. The industry needs problem solvers, individuals who understand how research relates to business success."

Larry Milligan, Vice-President for Research
University of Guelph

Increosing Conodo's export potential, ensuring the quolity ond sofety of the domestic food supply ond coring for the environment is the multi-foceted focus of the $1 million George Weston **Chair of Food Packaging Technology.**

The choir indudes groduote students ond post-doctoral fellows in troining for the food industry – ond will concentrote on new preservotion techniques, shelf-life modelling ond pockoging moterials development ond design. Teom members will engoge in strotegic, pre-competitive research thot will be ovoilable ond useful ocross the food sector.

Consumer convenience is recognized os on important issue for food-pockoging technology, especiolly for increosingly popular preparotion methods such os microwoving. As well, there ore environmentol concerns obout the obundonce of food pockoging thot ends up os woste.

Technologies must be developed to support long shelf lives for lightly-processed foods. Such developments hove implicotions obrood: the obility to offer stoble, ottroctive pockoged commodities to the export morket con enhonce product diversificotion.

"The less you process food, the more it needs packaging to protect it...There is the need for intelligent packaging that reacts to its environment by eventually biodegrading. The chair will lead a team that will look at all of these aspects as well as the needs of consumers and the distribution system."

Professor Marc Le Maguer
Department of Food Science
University of Guelph

V SUCCESSFUL INDUSTRY – R&D INSTITUTE LINKAGES

"The food network I belong to involves the top executives and scientists from the Canadian food-processing industry, the best food scientists and administrators from universities across the country and leading government officials involved in food and agriculture."

Percy Gitelman
President and CEO
UFL Foods, Inc.

Due to international promotions of value-added seafood products and the recent large catches of lobster in the Maritimes, Prince Edward Island lobster processing plants found themselves maintaining large inventories of frozen lobster-in-brine and canned lobster meat. In response to these circumstances, **Canadian Gourmet Foods Inc.**, sought the technical assistance of the **Prince Edward Island Food Technology Centre** in the development of value-added frozen seafood entrées that use previously-frozen lobster and scallop meats.

Collaborative efforts resulted in frozen entrées (lobster/scallop Mornay and Oriental) portion-packaged in vacuum pouches of high gas-barrier film. Based on sensory analysis for consumer acceptability and product safety over a period of frozen storage, preliminary results have proven to be encouraging.

Magic Pantry Foods of Hamilton, Ontario was recently involved in the development of a line of foods in semi-rigid microwaveable plastic trays with peelable closures. **Dr. Marvin Tung**, currently with the **Technical University of Nova Scotia**, and his group were called in to work on development of pressure/temperature profiles that would provide optimal processes while ensuring package integrity.

Co-operation between the **Food Processing Development Centre** at Leduc, and **Agriculture Canada's Lacombe Research Station** – both situated in Alberta, acts as a catalyst for extensive research activities – from production through processing and sensory evaluation. Emphasis is on promotion of innovation and the use of new technologies in the food industry by developing and promoting new products and processing concepts.

Expertise in modified atmosphere packaging has led to the successful marketing of extended shelf-life sandwiches for **Quality Fast Foods Ltd.**, an Edmonton-based sandwich factory. Specialized films and a mixture of carbon dioxide and nitrogen gases create an environment in which these products have a refrigerated shelf-life of 28 days.

Julac Inc., of the Saguenay-Lac St-Jean region of Québec, specializes in production, distribution and transformation of wild blueberries, and is currently working on the development of many food products that use their crop as a main ingredient.

Recently, Julac decided to form a partnership with **MAPIL (Modified Atmosphere Packaging Industries Ltd.), the Food Research and Development Centre at St-Hyacinthe** and **Provigo Distribution**, to adopt a new preservation technique that significantly extends the shelf life of fresh berries. Provigo's contribution to the project was mainly related to distribution tests and market assessment, while MAPIL's involvement concerned technical aspects in the field.

This major R&D project was coordinated by the Centre's food preservation technologies section by working closely with its three partners from the private sector. The Centre was also involved in providing technical support for Julac's personnel, while working at the Centre, with assistance from the **National Research Council of Canada's (Boucherville) - Industrial Research Assistance Program (IRAP)**.

The new process developed by the partnership, and adopted by its leader, Julac, will allow the famous Lac St-Jean blueberry to reach new and distant markets.

VI GOVERNMENT COMMITTED TO INDUSTRY

There are several federal and provincial government programs and mechanisms aimed at attracting new partners and investment to Canada. Some initiatives are administered by federal government departments and agencies or are jointly-administered and funded with provincial governments. A brief description follows:

ATLANTIC CANADA OPPORTUNITIES AGENCY (ACOA)

The Atlantic Canada Opportunities Agency is dedicated to the encouragement and assistance of investors and business in the Atlantic region. ACOA provides guidance and financial support to investors and entrepreneurs who seek to increase competitiveness, expand sales, introduce new products or develop new businesses.

ACOA, in conjunction with each of the Atlantic provinces, jointly administers Cooperation Agreements that focus on strategic priorities of each province including investment promotion and industrial development. The support programs associated with these agreements, along with other support programs, are designed to strengthen, expand and diversify the economic base of the Atlantic region.

Support is targeted at attracting new economic activity demonstrating long-term viability, and has been designed to provide sufficient flexibility to adjust to the rapidly changing environment influencing international trade and investment opportunities. Funding support is provided for strategic establishments, expansion or modernization in the manufacturing, secondary processing, and knowledge-based sectors.

DEPARTMENT OF WESTERN ECONOMIC DIVERSIFICATION (WED)

Western Economic Diversification works closely with the provinces and the private sector and manages a $1.2 billion fund to promote industrial diversification. Its Western Diversification Program provides interest-free financing to help develop new products, new markets, new technologies and improved industry-wide competitiveness.

The Program is specifically aimed at entrepreneurs – and welcomes ideas and proposals from investors outside of Canada. Funding is geared to eligible projects which could not proceed without it. Projects receiving support must have significant equity participation by the applicant or other sources of financial support. Western Diversification will also assist investors to find other federal and provincial programs for which they may be eligible.

THE INDUSTRIAL RESEARCH ASSISTANCE PROGRAM (IRAP)

IRAP is a National Research Council (NRC) initiative that provides technical assistance to companies through a national technology network. This program provides facilities, equipment, technologists, and funding for collaborative research projects with government, university or foreign laboratories, and companies located in Canada. The objective is to offer industry the means to commercialize the latest technical knowledge, inventions, and scientific knowhow.

NATURAL SCIENCES AND ENGINEERING RESEARCH COUNCIL (NSERC)

NSERC forges closer links between the university community and other sectors of the economy by promoting and supporting targeted research in selected fields of national importance. With its annual budget of more than $450 million, NSERC delivers major programs covering research personnel support, operating grants, equipment grants, and strategic and targeted grants.

Food Packaging and Labelling Equipment

1	**Capmatic Ltd.**	Packaging Machinery (Filling, capping, labelling) Monoblock Systems (Filling, plugging, capping) (Filling, stoppering, crimping)
3	**Damark Packaging Inc.**	Shrink packaging equipment
5	**The Deam Company Limited**	Custom designed case packing and materials handling systems
7	**Edson Packaging Machinery Ltd.**	Automatic and semi-automatic case erector-packer-sealers (case packers)
9	**Emplex Systems Inc.**	Forming, filling and sealing equipment Continuous rotary sealers
11	**General Conveyor Co. Ltd.**	Packaging machinery Material handling equipment Systems engineering
13	**Labelling Technologies**	Pressure sensitive labelling equipment Custom-engineered solutions to non-standard applications
15	**H. J. Langen & Sons Inc.**	Cartoners and case packers
17	**Charles Lapierre Inc.**	Packaging machinery Capping, filling, stamping, labelling Cottoners, conveyors, turntables
19	**Muller Manufacturing Ltd.**	Stretch Wrapping Equipment Automatic Applicators for Top Sheet, Top Cap, Corner Board Conveyor Systems
21	**Purity Packaging**	Filling Machines
23	**RDP Marathon Inc.**	Litho/Gravure Packaging Press Lithographic Print Stations
25	**Rotoflex International Inc.**	Inspection, slitting, rewinding equipment for label and roll-to-roll products Inspection equipment for pharmaceutical labels Die-cutting machines Rotary die-cutting/tooling
27	**Sanden Machine Limited**	Large web offset presses Collators, Sheeters, Folders, and ancillary equipment Custom engineered equipment for the web printer
29	**Joseph E. Seagram & Sons Ltd.** **Bottling Development Division**	New and/or reconditioned bottling lines up to 350 BPM High speed container orienters and channelizers Missing container in case detectors Cartonized – uncartonized container single and double case drop casepackers Wrap around casepackers
31	**Stanpac**	Closure applicating equipment
33	**Storcan Ltd.**	Industrial conveyors
35	**Unitrak Corporation Limited**	Bucket conveyor systems
37	**WeighPack Systems**	Net-weighing machines
39	**Wexxar Packaging Machinery Ltd.**	Automatic case formers and case sealers
41	**Zepf Technologies Inc.**	Packaging equipment, components and systems Design and manufacture of feedscrews and cams

CORPORATE CAPABILITIES

CAPMATIC LTD.

11,740 4th Avenue
Rivière-des-Prairies, Montreal, Quebec
CANADA H1E 3B3

Lavinio Bassani
President

Telephone: (514) 643-1512
Facsimile: (514) 643-1518

MAJOR PRODUCTS/SERVICES

- ***Packaging Machinery***
  (Filling, capping, labelling)

- ***Monoblock Systems***
  (Filling, plugging, capping)
  (Filling, stoppering, crimping)

NATURE OF BUSINESS

Capmatic Ltd., is a company that manufactures packaging machinery and equipment for the pharmaceutical, cosmetic, enological, chemical and food industries.

In 1979, after more than 35 years of experience in manufacturing packaging machinery in Europe, Mr. Lavinio Bassani, decided to move to North American market. Capmatic is situated in the city of Montreal.

Revenue: Estimated $1.5-2 million in 1991

Employees: 15 to 25 involved in operations

History: 1967 - Creation of the Bassani company by Mr. Lavinio Bassani, President in Italy

1979 - Manufacturing and distribution in Canada begun by Capmatic Ltd.

MARKET FOCUS

Capmatic is also a specialist in customized machinery for specific needs. (special liquids, bottles and caps).

Customers include:

Sabex Inc.,
Procter & Gamble,
Biopharm,
Cosmair, and
S.N.C. Technologies.

PRODUCT DESCRIPTION

Capmatic specialty is the Monoblock system. This system can do all filling, plugging and capping on the same base, at speeds of 60 to 120 bpm. Minimal space required is 4'x4' (4 square feet).

COMPETITIVE POSITION

Capmatic has a competitive edge because of:

- its experience in building monoblock systems using Italian designs built in North America;
- reliability and ease of operation; and
- a special mechanical system to pick-up and place plugs, rubber-stoppers and caps.

FUTURE DIRECTION

Capmatic research and development activities include:

- to keep up-to-date with state-of-the-art Monoblock system, strictly within F.D.A. requirements;
- to develop new Manoblock systems with speeds of more than 240 bpm; and
- worldwide recognition of Monoblock system.

PARTNERSHIPS SOUGHT

Capmatic is looking for several distributors:

- in Asia, Mexico and South America; and
- companies that can provide servicing on Capmatic's equipment.

CORPORATE CAPABILITIES

DAMARK PACKAGING INC.

1200 Tapscott Road
Scarborough, Ontario
CANADA M1X 1M5

William M. Steel
Vice President

Telephone: (416) 609-8011
Facsimile: (416) 609-8008

MAJOR PRODUCTS/SERVICES

- ***Shrink packaging equipment***

NATURE OF BUSINESS

Damark Packaging Inc (Damark) designs and manufactures shrink packaging equipment for a range of industries including food processors.

Damark sells over 80 per cent of its output in Canada. The remainder of its business is in the United States (10 per cent) with some sales to South America, Australia, the United Kingdom, Sweden, Singapore, Taiwan and China. Damark sells through distributors in Canada and the United States.

About 25 per cent of its market is in the food sector, with its other markets in the lumber, stationery and textile industries. Uses for Damark equipment in the food industry include:

- Wrapping produce such as oranges or cucumbers,
- Overwrapping flour bags,
- Shrink wrapping soft drinks,
- Shrink wrapping pet foods, and
- Wrapping bread.

Revenue: $1.6 million in 1991 – up from $1.0 million in 1990

Employees: 24

History: 1982 – Two people start Damark in Canada to design and manufacture an automatic "L"-sealer.

1984 – Allied Automation bought Damark and started a new company in Canada – Allied Automation of Canada.

1990 – Original shareholders re-purchased the company and moved to new premises.

MARKET FOCUS

Shrink packaging is widely used in the food industry and elsewhere. It is less expensive, easier to dispose of, and more flexible than corrugated board.

Customers in the food and beverage industry include:

- Effem,
- Price Club,
- Costco,
- Labatts,
- Mirade Mart/Steinberg,
- J.M. Schneider,
- Safeway,
- McCain Foods,
- Kraft General Foods,
- Maple Leaf Mills, and
- Burns Foods.

PRODUCT DESCRIPTION

Damark manufactures a range of shrink packaging machinery that is simple and functional.

- L-sealers and shrink tunnels
- Horizontal form-fill machines with speeds up to 40 packages per minute
- Sleeve wrapping and shrink tunnels for shipping type packages
- Specialized shrink tunnels

Benefits include:

- Ability to match size of equipment and degree of automation to customer needs;
- State-of-the-art sealing systems; and
- Long-lasting shrink tunnel heaters -- company is considering a lifetime guarantee.

COMPETITIVE POSITION

Damark has a competitive edge because:

- It has versatile products of good quality.
- It responds to customer needs.
- Exploits niches well.
- It has highly skilled and experienced people.

PARTNERSHIPS SOUGHT

- Licensing arrangements in Mexico.
- Distributor arrangement in Europe with the possibility of moving to licensing/ manufacturing in Europe.
- Distributor/agent arrangements in other parts of the world.
- Joint ventures with companies able to provide complementary products and/ or services.

CORPORATE CAPABILITIES

THE DEAM COMPANY LIMITED

101 Jardin Drive, Units 19-22
Concord, Ontario
CANADA L4K 1X6

Fred W. Beer
President

Telephone: (416) 738-0898/736-4593
Facsimile: (416) 738-3649

MAJOR PRODUCTS/SERVICES

- ***Custom designed case packing and materials handling systems***

NATURE OF BUSINESS

Deam designs and manufactures automated packaging machinery and material handling systems for the dairy, food, beverage and pharmaceutical industries.

Case packers are a major speciality. Applications encompass:

- Case packing of liquid milk pouches;
- Packing creamer cups;
- Cable conveyor systems;
- 90 degree belt conveyors;
- Dairy case stackers and de-stackers; and
- Complete dairy case handling systems.

Deam's capabilities include:

- Layout and installation of equipment;
- Designing and building to customer specifications;
- Distribution of its own equipment; and
- After-sales support and technical training for customers when required.

Revenue: Approximately $1.5 million in 1991

Employees: 15

History: 1976 – A group of employees working for Borden Research design a case packer for case packed milk. Borden decides to sell the design. Employees, including the present owner, take up the challenge. Since then, approximately 100 case packing systems have been installed, along with numerous custom designed casing, boxing, and materials handling systems.

1977 – Safeway orders two-case packing machines and become Deam's first customer in Western Canada.

MARKET FOCUS

Deam case packers are considered the standard for the dairy industry in Canada, enjoying virtually 100 per cent of the market for such equipment. Deam is building on its strong understanding of the dairy industry to expand to other geographic markets.

Exports to the United States are growing and recently the company received its first order from Britain. Customers in other sectors of the food industry and pharmaceutical industry are being developed as Deam expands its market.

Customers include:

- Ault Foods,
- Beckers,
- Neilson,
- Safeway,
- Beatrice Foods,
- Nestlé, and
- Baxter Foods.

PRODUCT DESCRIPTION

Deam's materials handling solutions include:

- Case packers for pouch milk cartons, creamer cups;
- Case stackers for dairy cases;
- Conveyors (belt, chain, cable, gravity, etc.);
- Destackers (top-out and bottom-out for plastic and wire dairy cases); and
- Vertical form sealers – film advances by weight of package.

Benefits include:

- Simplicity;
- Speed;
- Technical support facilitated by a modem link included as standard equipment; and
- Integrated systems controls that allow automatic shutdown of the line.

COMPETITIVE POSITION

Deam has a competitive edge due to:

- Systems integration capability – whereas competitors sell individual items of equipment;
- Customization skills to suit individual client needs; and
- Superior technical support.

Deam is currently developing equipment for future market needs. Higher-speed stackers and easy-to-clean conveyors are top priorities.

PARTNERSHIPS SOUGHT

- Joint ventures with firms in similar industries.
- Distributors that handle similar equipment.

CORPORATE CAPABILITIES

EDSON PACKAGING MACHINERY LTD.

1308 Rymal Road
P.O. Box 4057
Station D
Hamilton, Ontario
CANADA L8V 4L5

Trevor Gibson
President

Telephone: (905) 385-3201
Facsimile: (905) 385-8775

MAJOR PRODUCTS/SERVICES

- ***Automatic and semi-automatic case erector-packer-sealers (case packers)***

NATURE OF BUSINESS

Edson Packaging Machinery Ltd. is a custom designer and builder of automatic and semi-automatic case packaging equipment for use in diverse products including: soft bagged product, cartoned product, and rolled product.

Edson's engineering department uses the latest CAD technology and can provide our customers with the latest information via electronic transfer.

The engineering group are also responsible for our new research and development facility and customer training, start-up, and service.

Revenue: $6 million (1990)

Employees: 60 persons

COMPANY HISTORY

Edson Packaging Machinery was founded in 1966 to manufacture custom designed case packaging equipment (Case Erector-Packer-Sealer).

Since 1966 Edson has built over 900 machines of various sizes, and installed them around the world. The machines built by Edson handle a wide range of products including cookies, candy, cereal, frozen foods, diapers and bathroom tissue. This experience has provided Edson with extensive expertise in "product handling" in many areas including carton, rolled, and bagged products.

Much of the machine operating design is standard. However, the collating section, the size of the machine, and the operating speeds are always designed to the customer's specific requirements. The company also provides its customers with some electronic and pneumatic customization.

The flexibility of Edson's machine design and the ability to meet the customer's specific needs and preferences at a reasonable cost has been a critical factor in Edson's success.

MAJOR MARKETS

The major industries to which the company sells are the following:

- Tissue industry,
- Food industry,
- Tobacco industry,
- Pharmaceuticals and cosmetics, including vitamins, hair spray, etc.,
- Consumer products including bar soap, detergent, foil and film rolled products, toothpaste, video cassettes, light bulbs, toys, etc., and
- Industrial products, including caulking tubes, auto parts, fire logs, lubrication tubes, floor tiles, wallcovering, wax blocks, etc.

The tissue industry is the largest market for Edson. With over 250 machines built, we are recognized as one of two leaders in this field. Within the tissue industry, Edson supplies machines to handle diapers, bathroom tissue, household and industrial towels, napkins, feminine products, adult incontinence products, facial tissue, and banded tissue.

PRINCIPAL CLIENTS

The majority of Edson's customers are large multi-national companies, such as:

- Kimberly-Clark,
- Procter and Gamble,
- Scott Paper,
- General Foods,
- Norelco,
- Nabisco,
- Kellogg,
- Bristol-Myers,
- James River,
- Colgate, and
- Quaker Oats.

During the last ten years, Edson has managed several large multi-machine orders which include:

- cheese manufacture - 9 machines,
- tobacco - 15 machines, and
- bathroom tissue - 17 machines.

PRODUCT DESCRIPTION

Edson's equipment is designed to replace an operator who would hand pack products into a corrugated case.

Key benefits:

- improved productivity,
- flexibility with a custom built machine, and
- built to customer specifications.

COMPETITIVE POSITION

Edson is the number three manufacturer of horizontal case packers in North America. Edson machines are known for:

- its ability to handle a wide range of products and case sizes,
- custom design capabilities,
- competitive pricing, and
- customer service and support.

PARTNERSHIPS SOUGHT

Edson would be prepared to discuss joint ventures and license agreements outside of Canada.

CORPORATE CAPABILITIES

EMPLEX SYSTEMS INC.

2045 Midland Avenue
Scarborough, Ontario
CANADA M1P 3E2

Paul Irvine
Marketing Director

Telephone: (416) 291-8085
Facsimile: (416) 298-9949

MAJOR PRODUCTS/SERVICES

- ***Bag forming, filling and sealing equipment***
- ***Continuous rotary sealers***
- ***Weighing & Filling Devices***

NATURE OF BUSINESS

Emplex Systems Inc. (Emplex) designs and ships high quality packaging equipment all over the world and maintains a parts and service network throughout North America.

Emplex machinery is used for forming, filling and sealing flexible packages. All parts are fabricated, assembled and tested by the Emplex Division of Toronto Plastics, an ISO 9002 certified sister company.

Emplex's broad line of sealing equipment is sold to customers in packaged goods, health care, clothing, chemicals, seeds, soil and general utility packaging. More than 80 per cent of Emplex's sales are to export markets.

Revenue: Approximately $2.5 million in 1993

Employees: 35 (28 in Emplex division, 7 in Emplex Systems Inc.)

History: 1974 – Company created by entrepreneur-designer to build rotary sealers with Teflon bands. This was a first in North America.

1988 – Toronto Plastics purchased Emplex; operations brought into current plant.

Ownership: Owned by the Plextron Group. Emplex is 100 per cent Canadian owned.

MARKET FOCUS

Emplex serves two key industries – food and health care. The food industry accounts for approximately 40 per cent of company sales. Target customers include all companies that use flexible packaging. Well-known international customers in the food sector include:

- Nestlé,
- Cara,
- Dare Foods,
- Hershey,
- Cadbury,
- Kraft General Foods,
- General Mills,
- Frito-Lay,
- Procter and Gamble, and
- Tyson Foods.

PRODUCT DESCRIPTION

Emplex offers several models of continuous rotary heat sealers, weigh fillers and bag, form, fill sealers. The most advanced can withstand the rigours of the most demanding production environments while still producing outstanding packages at high speeds. A sealing speed of up to 3,000 inches per minute can be achieved. The product line also includes a table-top model for use in moderate production environments.

Product strengths include:

- Largest line of Rotary Heat Sealers on the market today. Different models have been designed to fit to environments as diverse as clean rooms, corrosive chemicals manufacturing and red meats production.
- Weigh Fillers are completely programmable and have total integration capabilities with sealers and bag form fill sealers. Accuracy is as good as 1 gram on weighing applications.
- Bag Form Fill systems are inexpensive, simple machines that save the cost of buying and inventorying pre-made bags. Product can be made and filled in either a horizontal or vertical position. The standard models will make bags from 3x3 to 12x18.
- All machines are built in an ISO 9002 environment. They are tested to the strictest quality standards.

COMPETITIVE POSITION

Emplex has a competitive edge because of:

- Product reliability, simplicity of design, operation and maintenance;
- Quality of package created;
- The product line is designed to be flexible enough to easily meet almost all customer requirements. This means that the amount of custom design in this portion of the packaging line is not necessary. When custom design is needed, cost savings for the buyer is substantial, and service of the machine is simple;
- ISO 9002 facilities; and
- Compliance with USDA and FDA standards.

FUTURE DIRECTION

Emplex research and development activities include:

- Integration of client's production control systems with P.L.C. controllers;
- Automated bagging and feeding systems;
- Upgrading of machines to meet emerging needs such as implementation of fuzzy logic for better control and adaptation to new FDA requirements; and
- Longer wearing Teflon sealing bands.

PARTNERSHIPS SOUGHT

Emplex is looking for new partners to expand its horizons.

- Investors for developing new engineering ideas into marketable products.
- Distributor arrangements in Europe, Asia and Mexico and South America.
- Service/parts networks in Europe, Asia, Mexico and South America.

CORPORATE CAPABILITIES

GENERAL CONVEYOR CO. LTD.

155 Engelhard Drive
Aurora, Ontario
CANADA L4G 4J9

Mr. W. A. Rickard
President

Telephone: (905) 727-7922
Facsimile: (905) 841-1056

MAJOR PRODUCTS/SERVICES

- ***Packaging machinery***
- ***Material handling equipment***
- ***Systems engineering & integrators for the packaging industry***

NATURE OF BUSINESS

- Specializes in engineering and design of packaging machinery
- Specializes in engineering and design of material handling equipment used for packaging bulk food processing, beverage and pharmaceutical handling equipment
- Specializes in engineering for "TURNKEY" projects plus project management
- Supply of manufacturing drawings of above items to international sub-contractors

Revenue: $7 million 1993

Employees: 60 persons

COMPANY BACKGROUND

- 45 years in business.
- Combined total of 35,000 square feet of manufacturing facility in Aurora with plenty of land for future expansion.
- Owns the manufacturing facilities.
- Presently proceeding to add 50,000 sq. ft. to manufacturing facility base.
- Exports 60 per cent of its products to U.S.A. and South America.
- Growth rate of more than 15 per cent per year.

MARKET FOCUS

- Focus is mainly in food, pharmaceutical and plastic industries
- Food industry represents more than 50 per cent of General Conveyor's market
- Performs engineering design and project management for international customers for "TURNKEY" projects
- Design and manufacture case and bag palletizer equipment with excellent international sales potential
- A major supplier of process conveyor equipment to Kellogg Company for cereal process manufacturing in the USA, Mexico and South America
- A major supplier of equipment to such companies as: Kraft General Foods, Nestlés, Effem Foods, Kelogg's etc.

PRODUCT DESCRIPTION

Machinery Division

- Aerosol Machinery
  - High speed valve unscramblers
  - Can pressure testers
  - Plastic pumptop valve unscramblers
  - Can depalletizers
  - Can accumulators
  - Magnetic can cleaners
  - Conveyors
- Injection Moulding Machinery
  - Conveyors for injection moulding machinery
  - Pre-form conveyors and wash stations
  - Robotic tooling plates
- Palletizer/Unitizer Machinery
  - Low infeed design, slow to high speed case palletizers
  - High infeed design, slow to high speed case palletizers
  - Robotic pick & place design, case, bag and pail palletizers/depalletizers
  - Robotic gantry design, multi-line case bag and pail palletizers/depalletizers
  - Multi-load mechanical shuttle design, case palletizers
  - Pallet and slip sheet dispensers
- Custom Labelling Machinery
  - Pressure sensitive labellers
- Lane Divider/Gate Diverters
  - Programmable 1 to 2 or up to 6 gate diverters
  - High speed slat diverters/converger for sanitary application, high speed case handling applications

Conveyor Division

- Sanitary slat conveyors for food and pharmaceutical application
- Sanitary design trough bulk food conveyors for cereal, powder and meat handling application
- Case and pallet handling conveyors
- Elevating and lowerating conveyors
- Horizontal and vertical accumulation conveyors
- Beverage conveyors for soft drinks, beer and alcohol industries

Systems Division

- Research and Development services
- Custom equipment design engineering services
- Project management services

COMPETITIVE POSITION

- 45 years experience
- High customer satisfaction
- Experienced in international sub-contracting and manufacturing
- Combined 59,000 square feet of manufacturing facilities in Canada and USA
- Design department is 100% CAD with fully experienced personnel
- Fabrication is 100% computerized with the most modern high speed, punch, shear and form equipment
- Machine shop is equipped with modern CNC equipment

PARTNERSHIP SOUGHT

- Agency/Distributor agreements
- Licensing international subcontractors to manufacture G.C.C.L. equipment for locally based international customers
- Technology sharing

CORPORATE CAPABILITIES

LABELLING TECHNOLOGIES

1435 Bonhill Road
Unit 31
Mississauga, Ontario
CANADA L5T 1V2

William K. Batter, P.Eng.
President

Telephone: (905) 564-2794
Facsimile: (905) 564-2793

MAJOR PRODUCTS/SERVICES

- ***Pressure sensitive labelling equipment***
- ***Custom-engineered solutions to non-standard applications***

NATURE OF BUSINESS

Labelling Technologies speciolizes in production systems with an emphasis on label and label-related components. Products designed, manufactured, and sold by the firm range from simple label dispensers to sophisticated, high-speed, in-line labelling systems. Labelling Technologies works closely with its customers in the packaged goods, packaging materials and distribution industries by defining short and long term needs of the client and designing a solution. This approach has led to the development of highly modular labelling equipment.

Revenue: Estimated $1.5 million in 1993 – Up from $600,000 in 1991

Employees: 12

History: November 1989 – William Batter and Eric Buss found business to supply labelling machines and service.

December 1989 – Sells first custom manufactured equipment.

January 1990 – Jodo Holdings Inc. is incorporated in Ontario – carrying on business under the name of Labelling Technologies.

January 1990 – Canadian service representative for German manufactured labelling equipment.

Ownership: Labelling Technologies is a 100 per cent Canadian-owned partnership of William Batter and Eric Buss.

MARKET FOCUS

Labelling Technologies has established a solid reputation for superior service and problem-solving capabilities. The firm uses a network of 20 labelling material converters and material handling companies to provide contact with potential customers. Labelling Technologies attends trade shows including PMMI in Chicago and Pac Ex in Toronto.

Clients include:

- Thomas J. Lipton,
- Nestlé,
- Kraft General Foods,
- W & H Voortman Limited,
- Northern Telecom,
- Valvoline Canada,
- Wella,
- Tetrapak,
- Hershey Canada Inc.,
- Nabisco Brands Ltd.,
- Toronto Star,
- General Motors,
- Toyota, and
- Primo.

PRODUCT DESCRIPTION

Labelling Technologies provides solutions for any combination of decorating (primary and promotional labelling, stickers, coupons), closure, sealing and identification (bar code and label) requirements. Equipment modules include:

- Electric label dispensers to assist manual application;
- Semi-automatic and fully-automatic labelling units for front and back labelling and wrap-around;
- Print and apply systems including dot matrix, direct thermal, thermal transfer;
- Bar coding hardware; and
- 4 PanelWrap of large rectangular jugs
- High speed wrap-around stations

COMPETITIVE POSITION

Advantages of Labelling Technologies' equipment are:

- Modular design;
- Ease of operation and versatility to handle a wide range of container shapes and sizes;
- Competitive pricing; and
- Well-engineered solutions to non-standard applications.

PARTNERSHIPS SOUGHT

- Alliance with a manufacturer of related equipment to develop new products – for example – a partner to help integrate new print technologies with print and apply systems (continuous laser printers).
- Agreement to licence and manufacture foreign labelling equipment.
- Foreign sales agents in Europe and the United States.

CORPORATE CAPABILITIES

H. J. LANGEN & SONS INC.

6154 Kestral Road
Mississauga, Ontario
CANADA L5T 1Z2

Ben Langen
International Sales Manager

Telephone: (905) 670-7200
Facsimile: (905) 670-5291

MAJOR PRODUCTS/SERVICES

- ***Cartoners and case packers, and robotics***

NATURE OF BUSINESS

H.J. Langen & Sons Inc. (Langen) designs, manufactures and markets cartoners and case packers for customers in the consumer packaged goods industry. Langen also designs turnkey packaging systems comprised of Langen modules integrated with other vendors' equipment.

Langen engineers use CAD for projects for complex custom design and engineering problems. In addition to its manufacturing capabilities, Langen provides its customers with training, installation, service, and reconditioning.

Revenue: $25 million in 1992

Employees: 125 in Canada

History: 1952 – Two sons of H.J. Langen, owner of a Dutch meat processing equipment manufacturer, come to Canada to expand the family business.

1954 – Langen brothers begin to manufacture cartoning equipment in Toronto.

1964 – H.J. Langen & Sons Inc. are incarporated in Ontario.

1988 – Joint venture with Langenpac NV of Holland to manufacture and market Canadian-designed cartoning equipment in Europe.

1991 – Joint venture with Kyoto Seisakusho Co. Ltd. of Japan to manufacture Japanese-designed case packers in Toronto for the North American market.

Ownership: Langen is a 100 per cent Canadian, family-owned business.

Langen owns 40 per cent of Langenpac NV of Holland and 60 per cent of a Japanese joint venture located in Toronto.

MARKET FOCUS

Langen serves a wide selection of markets including: food and beverage, paper converters, pharmaceutical, lighting, meat, and auto parts. Approximately 90 per cent of Langen equipment is exported, the majority to U.S. customers. Well known customers in the food and beverage sector include:

- Nestlé,
- Kellogg,
- General Mills,
- Seagram,
- Molson,
- Labatt,
- CPC International,
- Dare, and
- Sara Lee.

Always searching for the best solutions to customers' needs, Langen now holds over 170 active patents, and has established a joint venture to bring Japanese technology to North American customers.

Sales and marketing activities:

Langen sells equipment through a network of over 100 manufacturers representatives in many countries including:

- United States (50 representatives),
- Canada,
- Mexico,
- Colombia,
- Venezuela,
- Argentina,
- Chile,
- South Africa,
- Philippines,
- Taiwan,
- Japan,
- Singapore,
- Malaysia,
- South Korea,
- Israel,
- Australia, and
- New Zealand.

In Europe, Langenpac NV customizes, manufactures and services Langen-designed equipment. Langenpac NV supports manufacturers representatives across Europe.

In Canada, a team of eight direct sales people follow up on leads generated by the representatives. The direct sales force also executes Langen's marketing plan including:

- Trade shows (PMMI, Chicago; PacEx, Toronto; Westpac, California; Interpack, Germany; Asiapack, Singapore);
- Advertising (Packaging, Packaging Digest, Prepared Foods, Meat and Poultry Processing); and
- Brochures and videos.

PRODUCT DESCRIPTION

Langen designs a wide range of cartoners that insert products such as breakfast cereal bags, bottles, pies, spaghetti and cake mixes into cartons. Langen cartoners are modular, thus providing customers with a variety of configuration options. Features such as quick change-overs, adjustable product loading, and a choice of closing systems provides Langen customers with a variety of benefits such as:

- Greater efficiency and productivity;
- Feasibility of profitably by running a range of products on one packaging line; and
- Ease of operation and maintenance.

COMPETITIVE POSITION

Langen equipment is recognized for providing superior product handling. Langen is also known for its:

- Cartoners that handle a wide range of products and carton sizes;
- Custom design capabilities;
- Modular design; and
- Competitive prices.

PARTNERSHIPS SOUGHT

- Joint ventures to manufacture Langen equipment outside Canada.
- License and manufacture complementary technology from foreign firms.
- Manufacturers representatives.

CORPORATE CAPABILITIES

CHARLES LAPIERRE INC.

8, rue Plateau
Pointe-Claire, Québec
CANADA H9R 9Z7

Michel Lapierre
President

Telephone: (514) 630-6990
Facsimile: (514) 695-0801

MAJOR PRODUCTS/SERVICES

- ***Packaging machinery***
- ***Capping, filling, counting, labelling***
- ***Cottoners, conveyors, turntables***
- ***Blistering, cartoning***

NATURE OF BUSINESS

Charles Lapierre Inc. manufactures and distributes quality packaging machinery for the food, pharmaceutical, cosmetic and chemical industries. All work – from machinery design to parts manufacturing and assembly – is done in-house by specialized staff.

The head office and manufacturing facilities are located in Montréal (Québec), with sales offices in Montréal, Toronto (Ontario), Southern Florida and Fair Lawn (New Jersey). Charles Lapierre also has several manufacturer's agents.

Charles Lapierre Inc is also the exclusive distributor for several European, U.S. and South American manufacturers.

Revenue: Estimated $15 million in 1994

Employees: 50 involved in operations

History: 1967 – Creation of the company by M. Charles Lapierre who is still a member of the board of directors.

1971 – Manufacturing and distribution in Canada begun.

MARKET FOCUS

Since the company has its own engineering department, machinery can be customized to meet specific client needs. Well known customers include:

- Catelli,
- Casmair,
- Upjohn,
- Glaxo,
- RJR McDonald, and
- Novapharm,
- Apotex, and
- Baker-Norton.

PRODUCT DESCRIPTION

The Charles Lapierre line of machinery includes automatic capping machines, filling machines (gravity, pressure, vacuum) automatic cottoner machines, conveyors, pressure sensitive labelling systems, turntables, blister machines, and cartoning. All products are manufactured of stainless steel and are available in a variety of sizes and configurations. The company incorporates the latest in electronic and mechanical technology.

The company is proud of its service capability including its large inventory (over $2 million) of replacement parts.

PARTNERSHIPS SOUGHT

- Distributor arrangements in Europe, the United States and Asia.
- Foreign manufacturers that want to export to Canada.
- Companies that can provide a service and parts network in Europe, the United States, Mexico and Asia.

CORPORATE CAPABILITIES

MULLER MANUFACTURING LTD.

845K Tecumseh Road
Dollard des Ormeaux, Québec
CANADA H9G 4T8

Faruk Turfan
Vice-President, General Manager

Telephone: (514) 685-3160
Facsimile: (514) 685-3166

MAJOR PRODUCTS/SERVICES

- ***Stretch Wrapping Equipment***
- ***Automatic Applicators for***
  - ***Top Sheet***
  - ***Top Cap***
  - ***Corner Board***
- ***Conveyor Systems***

NATURE OF BUSINESS

Muller Manufacturing Ltd. has been active in the packaging industry for 13 years, specializing in automatic and semi-automatic stretch film packaging machinery. The company is the leading manufacturer in Canada and one of the top suppliers for the U.S. market which represents approximately 70% of its business.

Revenue: $10 to $15 million

Employees: 70

History: Muller was a privately owned company until purchased by the Newtec Group in 1986.

MARKET FOCUS

Stretch wrap systems are used in virtually all markets including consumer, pharmaceutical, food and beverage and textile industries.

Some typical customers include:

Irving Tissue	Nabisco Brands
Coca Cola	Pepsi Cola
Shell	Imperial Tobacco
Molson	

PRODUCT DESCRIPTION

Muller manufactures a full range of stretch wrap equipment for all markets:

- Packaging of consumer items for transportation and storage
- Packaging of raw material for transportation
- Automated equipment for increased production
- Reduction of packaging waste for environmental reasons
- Packaging equipment for reduction of damage goods

COMPETITIVE POSITION

Muller has a competitive edge because:

- Its patented high-speed rotating carriage machine is the fastest wrapping machine worldwide.
- Its flexible machine design allows for complicated options not available from its competitors.
- It provides film sealing capabilities on its automatic and semi-automatic equipment.
- It is recognized throughout the industry as a leader in new technologies.

PARTNERSHIPS SOUGHT

- Joint ventures in turnkey operations
- Distribution in Mexico and South America

CORPORATE CAPABILITIES

PURITY PACKAGING

A DIVISION OF GREAT PACIFIC ENTERPRISES

25 Aylmer Street
Peterborough, Ontario
CANADA K9J 6Y8

Jeffrey B. Parker
President
Michael J. Kelly
Director of Sales & Marketing

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Facsimile: (705) 743-4798

MAJOR PRODUCTS/SERVICES

- ***Filling and printed lidstock machines for the single service dairy and condiment markets***

NATURE OF BUSINESS

- Food packaging machine manufacturer
- Plastic packaging manufacturer
- Lamination/lidstock manufacturer
- Printer

Revenue: $25 million

Employees: 65

MARKET FOCUS

- Dairy producers in North America and European markets
- Single service food processors (i.e. jam, salad dressing)
- North American and European markets

PRODUCT DESCRIPTION

- Creamer filling machines - up to 2100 cups/min
- Butterpat filling machines - up to 750 cups/min
- Condiment filling machines - up to 750 cups/min
- Plastic cups for cream and non-dairy products
- Plastic cups for butter/margarine
- Plastic cups for condiments
- Printed lidstock for creamers, butterpats and condiments
- Complete after market service department to maintain Purity field equipment

COMPETITIVE POSITION

- Number two worldwide supplier of fill and seal systems for the products marketed.
- Fastest and most reliable fill and seal systems worldwide
- Economical systems guaranteeing 90% efficiency

FUTURE DIRECTION

- Interested in developing new markets for existing product lines
- Purity leases filling machines to processors and sells the plastic packaging and lidstock to run on its equipment

PARTNERING INTERESTS

Strategic alliance partners to assist in the marketing of Purity products into new, undeveloped markets currently not being serviced by Purity personnel.

Interested in synergistic products and systems for expansion of lines marketed in North America through existing sales and service team.

CORPORATE CAPABILITIES

RDP MARATHON INC.

2583 boul. Chomedy
Laval, Québec
CANADA H7T 2R2

Eric J. Short
President

Telephone: (514) 687-7262
Facsimile: (514) 687-2558

MAJOR PRODUCTS/SERVICES

- ***Litho/Gravure Packaging Press***
- ***Lithographic Print Stations***

NATURE OF BUSINESS

RDP Marathon Inc. (RDP) designs and monufactures lithographic printing presses for the packoging, labelling, direct mail and business forms market.

RDP specializes in high-production commercial print quality presses.

RDP sells over 80% of its output in the U.S.A.

Revenue: $7 million in 1993

Employees: 32

History: 1989 - Founded by 4 senior managers of an international corporation.

1990 - Market release of the RDP 200 series press.

1991 - Market release of the Maraflo II 4-form roller commercial Inker.

1993 – Market release of the RDP SR-200 press.

1994 – Market release of RDP's packaging press, LG-200V, combining lithographic and gravure printing technologies.

Ownership: RDP is a 100% Canadian owner-run business.

MARKET FOCUS

High quality lithographic packaging and label producers have recognized the added productivity of the high-speed web process.

RDP has targeted this market for premium quality press equipment with state-of-the-art real-time print control systems to offer the most productive press package possible.

COMPETITIVE POSITION

RDP is one of o few lithographic press manufacturers thot have recognized the need for specialized configuration of highly productive web packoging presses.

Due to the custom engineering expertise of the multi-lingual RDP engineering staff, RDP is able to deal with the customer to develop press design specifications for specific needs.

PRODUCT DESCRIPTION

- RDP developed its MARAFLO II 4 form roller commercial printing inker for the high end promotional graphics market. This development has been incorporated into RDP's model LG-200V pockoging press.

- The RDP press system is o custom engineered solution for the demanding packaging printer who seeks on individualized press system.

PARTNERSHIPS SOUGHT

- Joint venture to combine RDP lithographic printing press expertise with European ouxillary manufacture. The objective is to offer o truly European press along with local support.

- Agency representation for RDP equipment in Europe.

CORPORATE CAPABILITIES

ROTOFLEX INTERNATIONAL INC.

975 Meyerside Drive
Mississauga, Ontario
CANADA L5T 1P9

Mr. Reinhard Muhs
President

Mr. Harald Muhs
Vice President - Product Development

Mr. Val B. Rimas
Sales & Marketing Manager

Telephone: (416) 670-8700
(800) 387-3825 (in U.S.A.)
Facsimile: (416) 670-3402

MAJOR PRODUCTS/SERVICES

- ***Inspection, slitting, rewinding equipment for label and roll-to-roll products***
- ***Inspection equipment for pharmaceutical labels***
- ***Die-cutting machines***
- ***Rotary die-cutting/tooling***

NATURE OF BUSINESS

Rotoflex is on industry leader in the research, development, manufacture, sales and service of high performance inspection, slitting and rewinding machines. Rotoflex produces cost-effective solutions to meet the diverse and increasingly sophisticated needs of the converting, packaging and security-sensitive industries.

Ratoflex sells approximately 15% of its output in Canada, 35% to the U.S.A., 35% to Germany. The balance is sold through agents in other markets such as Mexico, South America, Australia, New Zealand, Pacific Rim, Scandinavia, England, Spain, Italy and South Africa.

About 75% of Rotoflex's market (machine and tooling) is in the label and tag industry. The balance of sales are made up of pharmaceutical labels and security paper inspection machines, as well as specialty die-cutting equipment.

Revenue: $9 million in 1991

Employees: 65

COMPANY HISTORY

Rotoflex International has been the leading designer and manufacturer of specialty machines for the label converting industry since 1976 with world-wide representation through its agents.

In 1976, Rotoflex Engraving Ltd. and Labeldie Ltd. were amalgamated, creating Rotoflex International. Both Rotoflex Engraving and Labeldie were serving the same customer base with rotary tooling for the manufacture of die-cut, pressure sensitive labels.

After developing the Rotoflex "Racer" and "S" machines, they were exhibited for the first time in Chicago, Illinois and shortly thereafter at a trade show in Germany, to high acclaim. Rotaflex has since set and maintained the industry standards in the inspection of roll-to-roll printed labels.

Innovations such as its patented Flexomount System, Automatic Web Gripper Feeder System with coreless rewinding (patented), Adjustable Splicing Table and Automatic Label Remover, to name a few, have made Rotoflex the world leader.

MARKET FOCUS

High quality converters and printers of roll-to-roll material, labels, and flexible packaging manufacturers which in turn supply the food, beverage, cosmetic and pharmaceutical industries.

Established markets, as well as growing markets where a high quality of packaging are mandatory for export sales.

Major customers include:

- Avery Dennison,
- Monarch Marking (Pitney Bowes),
- Bank of Canada,
- Bundesdruckerei (Germany),
- Zweckform (Germany),
- ICI of America,
- Hoechst Roussell,
- Wellcome Foundation, and
- Hoffman Laroche.

PRODUCT DESCRIPTION

- Rotoflex slitter inspector rewinder, Model VSI –
  High speed, inspection, slitting, rewinder - high performance features for maximum product quality for webs from 250mm (10 inches) to 400m (16 inches).

- Rotoflex slitter inspector rewinder, Model VLI –
  High speed, inspection, slitting, rewinder - high performance features for maximum product quality for webs from 250mm (10 inches to 500mm (20 inches). Available with hi-tech inspection options and computer controlled drive system.

- Rotoflex inspection machine, Model VIR –
  Rotoflex's VIR is a dedicated high speed master roll-to-master-roll inspection machine providing total quality control. The VIR is computer controlled, bi-directional and designed for high performance operations.
  The VIR is available in widths of 330mm (13 inches) to 500mm (20 inches)

- Rotoflex inspection machine, Model VTI –
  Rotoflex's VTI is a computer-controlled machine for the automatic high speed inspection, verification and certification of labels for security sensitive industries. The VTI is available for 250mm (10 inches) web widths.

- Rotoflex Die-Cutting machine –
  For special die-cutting applications available with laminating station, stripping tower, automatic register control, perforating and punch hole stations, slitting, sheeting, and fan folding.

COMPETITIVE POSITION

Rotoflex's competitive position is due to:

- flexible and versatile engineering and manufacturing;
- responsive after sales service and training; and
- marketing to the real needs of the customers.

PARTNERSHIPS SOUGHT

- Joint ventures with companies able to provide complementary products and or services within the Labels and Labelling and Pharmaceutical Packaging Industries;

- Licensing arrangements in Europe, South America and Pacific Rim;

- Distributor arrangement in Europe with the possibility of moving to licensing manufacturing in Europe; and

- Distributor/agent arrangements in other parts of the world.

CORPORATE CAPABILITIES

SANDEN MACHINE LIMITED

1225 Balmoral Road
Cambridge, Ontario
CANADA N1T 1A4

A.L. van derSanden
President

Telephone: (519) 623-8510
Facsimile: (519) 623-6772

MAJOR PRODUCTS/SERVICES

- ***Large web offset presses***
- ***Collators, Sheeters, Folders, and ancillary equipment***
- ***Custom engineered equipment for the web printer***

NATURE OF BUSINESS

Sanden Machine Limited specializes in printing machinery for the business forms, commercial, direct mail, and food packaging industries.

Products designed, manufactured, and sold by the firm range from very large presses and collators, used for runs in the millions, to simple imprinters and pack collators used for very short runs.

COMPANY HISTORY

A.L. van derSanden started the business in 1962 in his garage. He incorporated the company in 1965 and started exporting in 1972.

Revenue: $12,000,000 to $15,000,000

Employees: 60 persons

Ownership: Sanden Machine Limited is a 100 per cent Canadian company. One hundred per cent shareholder is A.L. van derSanden.

MARKET FOCUS

Sanden has established a solid world-wide reputation for superior, "state-of-the-art" equipment. The company has manufacturing plants in Canada and Brazil, and a service and distribution plant in Holland.

PRINCIPAL CLIENTS

- Moore Business Forms
- Eastern Continuous Forms
- Bazaar and Novelty
- Custom Cheques of Canada
- Crain Drummond Inc.
- Reynolds & Reynolds
- Data Business Forms
- Nebs
- Duplex
- 3Z Printing

PRODUCT DESCRIPTION

Equipment to manufacture business forms, cheques, airline tickets, bingo tickets, direct mail pieces, and food packages and labels.

COMPETITIVE POSITION

Sanden manufactures state-of-the-art web equipment with the latest computerized control systems. The equipment is of modular design, easy to operate, and competitively priced. Custom built designs can be readily produced for new applications.

PARTNERSHIPS SOUGHT

- Licensing agreement to manufacture foreign related equipment
- Joint ventures

CORPORATE CAPABILITIES

JOSEPH E. SEAGRAM & SONS LTD.

BOTTLING DEVELOPMENT DIVISION

592 Colby Drive
Waterloo, Ontario
CANADA N2V 1A2

Robert E. Banyard
Division Director

Telephone: (519) 886-9090
Facsimile: (519) 886-9306

MAJOR PRODUCTS/SERVICES

- ***New and/or reconditioned bottling lines up to 350 BPM***
- ***High speed container orienters***
- ***Missing container in case detectors***
- ***Cartonized – uncartonized container single and double case drop casepackers***
- ***Wrap around casepackers***
- ***Research and development of new machinery design***
- ***Packaging equipment change and spare parts***
- ***Packaging equipment reconditioning***
- ***Container channelizing***
- ***Packaging line consulting and training of line personnel***

NATURE OF BUSINESS

The Bottling Development Division (BD) designs, manufactures, markets and installs packaging machines and systems. Its speciality is high speed bottling lines. It also provides new and reconditioned equipment and parts. BD also assists with equipment selection and operator training.

BD transforms customer needs into packaging line solutions using strong in-house experience and engineering expertise. BD design engineers use CAD stations. The machine shop is flexible and includes CNC and traditional machines.

Revenue: Estimated $4 million in 1991 – up from $1.2 million in 1990

Employees: 27

History: 1960 – BD begins to provide change parts to Canadian Seagram affiliates.

1976 – Begins providing U.S. and then international Seagram affiliates with change parts.

1978 – Begins to recondition packaging equipment for Seagram affiliates and to produce spare parts.

1980 – Productivity pressures force BD to begin research into automation equipment.

1987 – Begins selling change and spare parts and reconditioned equipment to non-Seagram companies.

1990 – Begins building network of foreign soles agents and introduction of BD at Chicago PNMI show as turnkey solution provider.

1991 – Develops and sells first high-speed bottle orienter running up to 600 bottles/minute.

Ownership: BD is 100 per cent owned by Joseph E. Seagram & Sons Ltd. of Montréal, Québec.

MARKET FOCUS

The Bottling Development Division parlayed 27 years of Seagram-specific bottling line experience into an outwardly focused business earning approximately half of its sales revenue from non-Seagram companies.

BD's market encompasses all bottled liquid goods manufacturers worldwide (for glass and plastic bottles).

Current customers include: 16 bottling operations of Seagram, plus Heinz, Unilever, Cadbury Schweppes, S.C. Johnsons, Parke Davis, Boyle-Midway and Jim Beam Brands.

BD frequently invites and pays for prospective customers to visit its production facility in Waterloo. BD sells its equipment directly and through a network of sales agents located in:

- Canada (1),
- United States (4),
- United Kingdom (2), and
- Venezuela (2).

Marketing activities include:

- Sales agent support through customer site visits by Canadian personnel,
- Company and product brochures,
- Trade shows, for example, PMMI in Chicago, and
- In house training at BD for sales agents.

PRODUCT DESCRIPTION

BD equipment is designed for any glass or plastic bottling application for liquid goods. BD's most promising original equipment include a high-speed rotary bottle orienter, and a missing-bottle detector. Other original equipment includes: case packer, cartonizer/uncartonizer, coupon applicator, wrap-around case packer, flask bottle uncaser, channelizer, rear flap tucker, choke neck sensor, leak detector and change and spare parts.

BD's bottle orienter is fast (600 bottles/minute), versatile (handles glass or plastic containers and has 90, 180, 270 degree bottle orientation capabilities); and is easy to operate and maintain.

The missing bottle detector triggers an alarm when it senses a case that is not full. This saves labour and eliminates claims against incomplete shipments. It can be integrated with a rejection unit. BD reconditions bottle fillers, case sealers, and spare parts.

COMPETITIVE POSITION

- BD bottle orienter operates at much higher speeds than its competitors.
- The firm's working relationships with a handful of leading manufacturers, and in-house experience, enable the development of turnkey solutions.
- BD offers a range of services including equipment selection, design, installation training and fast delivery.

FUTURE DIRECTION

BD expects non-Seagram affiliate business to grow to 80 per cent in the next few years. It plans to realize this growth partly through its new products. Other prospects include turnkey packaging solutions, CNC machining services, and the introduction of change parts for rotary bottle labelling equipment.

PARTNERSHIPS SOUGHT

- Joint venture to manufacture packaging equipment.
- R&D partnerships.
- Joint venture to operate packaging lines.
- Worldwide sales agents.

CORPORATE CAPABILITIES

STANPAC

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Smithville, Ontario
CANADA L0R 2A0

Murray Bain
Marketing Manager

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Facsimile: (905) 957-3616

MAJOR PRODUCTS/SERVICES

- ***Closure applicating equipment***
- ***Preformed heat seal closures***
- ***Polyethylene juice bottles***

NATURE OF BUSINESS

Stanpac designs, manufactures and sells foil-laminated closures and closure applicating equipment. Today's consumers demand products that minimize environmental impact. Stanpac's focus on returnable containers means that it is well positioned to do business in the changing packaging market.

Stanpac's operations include presses, slitters, coaters and laminators for the manufacture of foil-laminated closures, as well as inner seals and paper-formed closures. Closure-applicating equipment is manufactured in Stanpac's metalworking shop.

Revenue: $9 million in 1993

Employees: 60

History: 1949 – Standard Cap & Seal Canada Ltd., owned by Standard Packaging of Chicago, begins operation in Ontario producing milk bottlecaps and capping equipment for Canadian dairies.

1970 – Mr. Steve Witt, a Canadian, purchases the company from Standard Packaging.

1980 – Begins manufacturing paper formed closures.

1985 – Company name changed to Stanpac.

1988 – Begins manufacturing and selling inner seals.

1991 – Completes development of unique induction belt sealer.

Ownership: Stanpac is 100 per cent Canadian-owned by two shareholders. Mr. Steve Witt, Stanpac's President, holds a majority interest in the company.

MARKET FOCUS

- Approximately 85 per cent of North American dairies that use refillable containers also use Stanpac closures.
- Approximately 85 per cent of Stanpac production is sold outside Canada.
- Stanpac holds two active patents with another pending.

Stanpac has many large customers in dairy, water and juice including:

- Nestlé Dairy Systems,
- Elmhurst Dairies,
- Dairyland,
- Ault Foods,
- Pure Flo Water, and
- 3M.

Stanpac has a direct sales force of three persons and seven agents in a distributor network. The firm attends Dairy trade shows and advertises in *Dairy Field, Dairy Foods, Modern Dairy, Packaging Digest,* and *Food & Drug Packaging,* as well as newsletters and brochures.

PRODUCT DESCRIPTION

Stanpac is the North American leader in the production of paper/foil-laminated closures for refillable containers. Stanpac's low maintenance capping equipment complements the closure business, providing customers with a single-source capping supplier. Stanpac's paper/foil-laminate closures are:

- Tamper-evident,
- Economical, and
- Part of an environmentally sound packaging approach.

FUTURE DIRECTION

Building on its strength in container closures, Stanpac has recently developed a unique reclosable paper-formed closure with an integral inner seal and visual tamper evidence. This new closure will provide better product freshness and safety for the consumer. To reinforce its position as a "single-source" supplier of closures, Stanpac has developed unique applicating equipment for the reclosable closure.

Stanpac also plans to begin selling a newly developed induction belt sealer. This equipment applies Stanpac's heat seal foil closures.

PARTNERSHIPS SOUGHT

- Alliance a with marketing-oriented firm specializing in dairy and beverage packaging for the North America market that will allow Stanpac to manufacture or distribute additional lines.
- Distributors in Mexico, Europe, South America, Caribbean, Asia.

CORPORATE CAPABILITIES

STORCAN LTD.

108 Bélanger
Châteauguay, Québec
CANADA J6J 4Z2

Marc-André Houde
President

Telephone: (514) 698-2158
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MAJOR PRODUCTS/SERVICES

- ***Industrial conveyors***

NATURE OF BUSINESS

Storcan Ltd. custom-designs and manufactures a wide range of quality conveyors for the food industry. The company has its own engineering department. Because requirements vary so much for each installation, extensive analysis, planning and problem solving go into every aspect of design.

Production is done in-house by speciolized staff. Installation and service is provided by a specialized field team to provide the highest level of service and maximum equipment performance.

Revenue: $2.5 million in 1991

Employees: 30

History: 1976 – Company founded by entrepreneur-designer, Mr. Marc-André Houde, to market custom-designed conveyors.

PRODUCT DESCRIPTION

Storcan manufactures industrial conveyors for the packaging, bottling, food, pharmaceutical and other industries. Because manufacturing and assembly of all conveyors is done in-hause, testing and quality control is an integral part of the production process. The Storcan product line includes:

- Package/case divergers;
- Guide rail system;
- Belt-on-roller conveyors;
- Belt-on-slider conveyors;
- Live roller belt and chain driver conveyors;
- Stainless steel "tabletop" conveyors; and,
- Accessories.

Conveyors listed above are available for cans, bottles, cases and other applications.

MARKET FOCUS

Storcan sells its conveyors almost exclusively to the food industry through a distribution network that supports sales all across Canada. More than 70 per cent of its sales revenue are generated in Ontario and Quebec. The company has installed conveyors in companies such as:

- Pepsi Cola,
- Molson O'Keefe,
- McCain Foods,
- Purdel,
- Imperial Tobacco,
- RJR McDonald,
- Rothmans, and
- Kraft-General Foods.

FUTURE DIRECTION

Storcan is negotiating agreements with European partners to export its technology to European markets. This constitutes a realistic approach to market expansion for a type of product for which transport costs are extremely high.

PARTNERSHIPS SOUGHT

Storcan is seeking partners:

- To distribute its technology in Europe; and
- To support new engineering concepts and designs.

CORPORATE CAPABILITIES

UNITRAK CORPORATION LIMITED

369 Ward Street
Port Hope, Ontario
CANADA L1A 3W4

Bill Gorsline
President

Telephone: (905) 885-8168
Facsimile: (905) 885-2614

MAJOR PRODUCTS/SERVICES

- ***TipTrak conveyor systems***
- ***Efficia case packers***

NATURE OF BUSINESS

Unitrak Corporation Limited (Unitrak) designs, manufactures and sells several models of TipTrak, an interlocking, non-metallic bucket conveyor system. Using CAD systems, Unitrak customizes the basic TipTrak design to fit customers' specific applications. The patented rubber chain at the heart of the TipTrak design has all the advantages of chain and yet has no moving parts and is corrosion-resistant.

Unitrak's other business activities include spare parts supply for TipTrak customers, as well as the manufacture and sales of the Efficio case packer. This is an economical way of automatically counting and packing pouches or bags into a case.

Revenue: $2 million in 1990

Employees: 17

History: 1969 – Unitrak is incorporated in Ontario to operate the TipTrak purchased from Uniroyal.

1984 – Flo-Mech Packaging Machinery Ltd., a U.K. company, begins to design, assemble and sell Unitrak equipment for the U.K. market.

1988 – C. Itoh, a Japanese trading company, begins to distribute Unitrak equipment for the Japanese market.

1989 – Unitrak acquires design and manufacturing rights for the Efficia random case packer.

Ownership: Unitrak is a 100 per cent Canadian, family-owned business.

MARKET FOCUS

Unitrak sells primarily to the North American market, and is actively developing the United Kingdom and Japanese markets.

Unitrak focuses its sales and marketing efforts in the food processing and chemicals industries. TipTrak's features are attractive to process engineers who are familiar with the difficulty of conveying materials such as freeze dried coffee, cereals, frozen vegetables, candy, and other hard-to-handle foods; as well as abrasive and corrosive chemicals.

TipTrak users include:

- Kraft General Foods,
- Canada Packers,
- Catelli Pasta,
- Hostess,
- Norton,
- Boyd Potato Chips,
- Nabisco,
- Church & Dwight,
- Eveready, and
- Frito Lay.

Efficia users include:

- J.C. Johnson & Sons,
- Ortho McNeil,
- Cadillac Coffee,
- Melrose Coffee,
- Hershey,
- Tetley Inc.

Fourteen manufacturers' representatives sell Unitrak equipment across North America. A Japanese trading company distributes this Canadian product. A U.K. affiliate designs, assembles, sells Unitrak products.

Unitrak salespeople attend trade shows including Powder and Bulk Solids and PNMI in Chicago, Pac Ex in Toronto. Unitrak advertises in Food Engineering, Packaging Digest, Chemical Equipment, Food in Canada, Canadian Packaging. The company uses brochures and direct mail as part of its marketing efforts.

PRODUCT DESCRIPTION

Benefits include:

- Interlocking buckets, connected by a rubber joint strip, eliminate spillage because they never separate and have no overlapping lips to catch product;
- TipTrak can travel horizontally, vertically or at any angle in between, without transferring product between conveyers, and elimates product damage at the transfer paints. Once the product is inside the TipTrak bucket, it travels undisturbed; and
- Maintenance free – interlocking assemblies have no moving parts, which means less wear and increased reliability.

Unitrak's Efficia random case packer handles any pouched product. It is fully automatic, reliable, and quick and easy to change over. Efficia suits companies interested in making their production line more efficient.

COMPETITIVE POSITION

Unitrak is the only North American manufacturer of interlocking bucket conveyor systems. Interlocking bucket conveyor systems provide many benefits over conventional pivoted bucket conveyor systems – such as larger capacity derived from deeper buckets and a higher filling percentage.

Unitrak takes pride in its ability to meet the challenges of customizing equipment. Customer needs, such as the ability to handle special materials, or to alter specified capacity, has resulted in a variety of innovative design changes that keep the customer sotisfied.

PARTNERSHIPS SOUGHT

- Rights to manufacture and sell unique, complementary equipment such as other bulk handling conveyor equipment for TipTrak, or taping equipment for Efficia.
- Licensing TipTrak design to a foreign affiliate for limited manufacturing and sales.
- Distributor arrangements in South America, Mexico, South Korea, and Taiwan.

CORPORATE CAPABILITIES

WEIGHPACK SYSTEMS

1332 William
Montréal, Québec
CANADA H3C 1R5

Louis Taraborelli
President

Telephone: (514) 932-7137
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MAJOR PRODUCTS/SERVICES

- ***Net-weighing machines***

NATURE OF BUSINESS

WeighPack Systems, a Montréal company, designs and manufactures high quality linear net-weighers for the food industry. Electronic and mechanical design, assembly, calibration and testing is done in-house. WeighPack Systems has its own engineering department using CAD and maintains an aggressive R&D budget.

WeighPack Systems is currently the only manufacturer of linear net weighing machines in Canada. Machines are in operation in Canada, the United States and Mexico.

All equipment is backed by a reputation for quality, plus fast and dependable service.

Revenue: Sales are estimated at $1.5 million for 1992

Employees: 12

History: 1984 – Creation of company by its current president/ owner, M. Louis Taraborelli. Research and development on net weighing machines begun.

1987 – Launches linear net weighing machines.

MARKET FOCUS

Most sales are in the United States. Target customers within the food industry are small- to medium-size food manufacturers and/or specialized packaging companies. Some equipment is also sold to the pharmaceutical industry. Well known customers include:

- Maple Leaf Foods,
- Horton Spice Mills,
- David Robert Food Corporation,
- McCormicks
- Nutrina Inc., and
- Gemini Pharmaceuticals.

PRODUCT DESCRIPTION

WeighPack Systems has many basic models of linear net-weighing machines.

Standard features indude:

- Micro-processing control
- Two vibrating motors with separate bulk and dribble pans and separate vibrator speed controls,
- Dual set-weight adjustments and lbs/kilo conversion switch, 1 gram weight increments, 1/28th ounce reading,
- Fast response rate – 200 conversions per second,
- Separate adjustable flow gates on hopper and vibrators; and adjustable door opening on weigh bucket,
- Cycle dwell timer,
- Two modes of operation, automatic sequencing or foot pedal dump,
- Floating digital display – displays final weight per cycle,
- Made with heavy-gauge stainless steel and/or steel, and
- Polished to meet the strictest hygiene requirements.

The machines are suitable for weighing a variety of products induding: coffee, flour, spices, nuts and peanuts, sea food, frozen food, hardware, cereal, candy, pills, pasta and bulk food.

Various models are available from simple low-end production requirements to multi-head high-speed applicotians.

PARTNERSHIPS SOUGHT

- Distributor arrangements in Europe, Asia and Middle East.
- Service and parts network for some areas.
- Technology transfer, joint ventures.

CORPORATE CAPABILITIES

WEXXAR PACKAGING MACHINERY LTD.

12511 No. 2 Road
Richmond, British Columbia
CANADA V7E 2G3

George Zador
Export Sales Manager

Telephone: (604) 277-5222
Facsimile: (604) 274-6418

MAJOR PRODUCTS/SERVICES

- ***Automatic case formers, case sealers with closure systems using cold or hot adhesive and pressure sensitive tape***

NATURE OF BUSINESS

Packaging machinery manufacturer

Employees: 45

History: Founded in 1978. Extensive exporters. Former recipient of Canada Export Award

Ownership: Private

MARKET FOCUS

Markets include all producers of goods with corrugated case packaging.

Sales and marketing through agents and distributors (some house sales).

Main customers include:

- Pillsbury
- Nestlé
- Procter & Gamble
- Campbell Soup
- KGF
- Imperial Tobacco
- Uni-Lever
- Oscar Mayer

COMPETITIVE POSITION

- Very high quality, top third of price range for similar type of equipment
- Uses unique and patented methods unlike any other similar equipment

FUTURE DIRECTION

Interested in potential sales in Mexico, Central and South America.

PARTNERING INTERESTS

Wexxar seeks a strategic alliance partner that is a well-established packaging machinery manufacturer of compatible lines; and offers a large regional (if not full country) coverage, possesses several technical sales people and offers full after-sales service capability.

CORPORATE CAPABILITIES

ZEPF TECHNOLOGIES INC.

70 Rankin Street
Waterloo, Ontario
CANADA N2V 1V9

Larry Zepf
Chief Executive Officer

Telephone: (519) 884-6470
Facsimile: (519) 884-7456

MAJOR PRODUCTS/SERVICES

- ***Packaging equipment, components and systems***
- ***Design and manufacture of feedscrews and cams***

NATURE OF BUSINESS

Zepf Technologies Inc. (ZTI) uses advanced Computer Aided Design and Manufacture (CAD/CAM) techniques to design and manufacture feedscrews, change parts, cams, and complete container handling systems. ZTI's strong research and development base has led to its emergence as a company of problem solvers, providing new and innovative solutions to customers in the bottling and packaging industry.

ZTI makes 80 per cent of its sales to end user markets and 20 per cent to Original Equipment Manufacturers (OEMs).

Revenue: $12 million in 1993

Employees: 91

History: 1972 – ZTI incorporated in Ontario, designing and manufacturing change parts and retro-fitting equipment.

1980 – Begins designing feedscrews and manufacturing them on newly purchased Computer Numerical Control (CNC) machines. Begins selling in the United States.

1985 – Introduces CAD and begins to custom-build machinery to manufacture feedscrews.

1988 – Begins selling in Mexico.

1989 – Wins Canada Awards For Business Excellence.

1990 – Begins selling in Europe.

1993 – ZTI established UK Service Centre

Ownership: ZTI is a 100 per cent Canadian, family-owned business with a board of directors comprising both owners and outside individuals.

MARKET FOCUS

- End-user markets include food, beverage, pharmaceutical, homecare, motor oil and other packaged goods companies.
- OEMs include manufacturers of cartoners, fillers, cappers, case packers and check weighers.
- Exports make up approximately 70 per cent of ZTI shipments.
- Recognized as a world leader in feedscrew design and manufacture from ZTI-designed software and equipment.
- Chosen as worldwide corporate supplier to Procter & Gamble and Lever Brothers.

Current customers include:

- Coca Cola,
- Heinz,
- United Distillers,
- Schenley,
- E.D. Smith,
- Nestlé, and
- Hershey.

Zepf's sales and marketing program includes:

- Direct sales force of 4 – 3 focused on North America, 1 on foreign markets;
- Agents in Scotland, England and Mexico;
- Attendance at trade shows such as PMMI in Chicago, Pac Ex in Toronto, and Interpac in Germany; and
- Brochures, videos and direct mail.

PRODUCT DESCRIPTION

Feedscrews, from the simple to the complex, are conceptualized and designed by ZTI engineers, and are manufactured on ZTI-designed multiple-axis CNC equipment. Functions provided by these screws include:

- Timing,
- Dividing,
- Combining,
- Indexing,
- Inverting,
- Grouping,
- Orienting, and
- Dwelling.

Container handling systems are mechanically and electronically linked to provide for continuous, high-speed operation and quick and easy changeovers. ZTI customizes equipment with devices such as programmable logic controllers (PLCs), and servo-motors to meet specific customer requirements.

Change parts adapt packaging machinery to differing sizes and shapes of containers. Change parts are available to meet original equipment specifications, or can be custom-designed for specialized applications.

COMPETITIVE POSITION

ZTI is one of a handful of companies worldwide having both design and manufacturing expertise for feedscrews and change parts. ZTI's technological capabilities allow for the production of very high quality products.

ZTI complements this capability by responding quickly to customer needs. The company prides itself on its ability to design and ship new products quickly, as well as supply replacement parts when needed. A computer database supports this capability.

PARTNERSHIPS SOUGHT

- Joint venture to design and manufacture ZTI products in new markets such as Europe, Mexico and South America.
- Joint venture to manufacture or distribute unique, foreign-design/ manufacturing technology, especially where ZTI can add value via its packaging expertise.
- Investors looking to purchase a minority interest. Capital would be used to increase marketing efforts.
- Distributors or sales agents in South America, Central America, continental Europe and Asia.

Food Processing Equipment

43	**ABCO Industries Ltd.**	Fish and vegetable processing equipment Award-winning vegetable blancher
45	**Advanced Equipment Inc.**	Quick freezing, cooling and cooking equipment
47	**BEVCO Conveying Systems**	Conveyors Rinsers, warmers/coolers Accumulation tables
49	**Bloemhof Industries (1986) Ltd.**	Bakery industry equipment Sheeters, moulders and baggers
51	**Charland Thermojet Inc.**	Specialized steam/water mixing machinery
53	**Charlottetown Metal Products**	Vegetable processing equipment Fish processing and handling equipment Mussel processing equipment Liquid handling and storage equipment
55	**Dipix Technologies Inc.**	Electronic imaging and detection
57	**Global Marine Products Ltd.**	Food smokers Longline equipment
59	**Neptune Dynamics Limited**	Herring sex discriminator Can sampler Roe herring opener Data acquisition for QA/QC for food processing
61	**Nordion International Inc.**	Food irradiation equipment
63	**O'Hara Manufacturing Limited**	Tablet coaters Ovens, mixers, kettles, mills, tanks
65	**Quadro Engineering Inc.**	Size reduction mills Wet mixers Vacuum conveyors
67	**Schmidt Farms**	Flour milling
69	**Small Brothers Evaporators**	Maple syrup processing equipment
71	**Statiflo Inc.**	Static mixers

CORPORATE CAPABILITIES

ABCO INDUSTRIES LTD.

81 Tannery Road
Lunenberg, Nova Scotia
CANADA B0J 2C0

J.D. (Jim) Eisenhauer
President

Telephone: (902) 634-8821
Facsimile: (902) 634-8583

MAJOR PRODUCTS/SERVICES

- ***Fish and vegetable processing equipment***
- ***Award-winning vegetable blancher***

NATURE OF BUSINESS

ABCO Industries Limited (ABCO) manufactures a wide range of fish processing and vegetable processing equipment. Its products include an award-winning, energy-efficient, heat and hold vegetable blancher.

ABCO capabilities include engineering design, fabrication, machining and assembly. The company operates an industrial equipment sales and service group for products that ABCO sells on an agency or distributorship basis.

Employees: 75

History: 1947 – ABCO begins operation in wharf construction and marine work,

1950s – Commences manufacturing of equipment for fish plants,

1984 – Begins manufacturing and distributing vegetable processing equipment,

1986 – Begins selling the vegetable blancher.

Ownership: ABCO is a 100 per cent Canadian, family-owned business incorporated in Nova Scotia.

Printed in Canada 08/94

MARKET FOCUS

ABCO sells the K Series Blancher via direct sales and through sales agents located in:

- United States
- Australia
- New Zealand
- Europe

ABCO's sales force attends trade shows including Midwest Food Processors (U.S.), North Western Food Processors (U.S.), Anuga (Germany). Brochures and fact sheets are available.

ABCO has established an international customer base for the vegetable blancher that includes:

- Kraft General Foods,
- Uncle Ben's Rice,
- Edgell Birds-Eye, Australia,
- J. Watties Canneries, New Zealand,
- Twin City Foods,
- Green Giant, and
- Gerant, Holland.

PRODUCT DESCRIPTION

ABCO's K Series Blancher consists of separate heat and hold sections. The heat section is non-pressurized – allowing product to be exposed to live steam for much shorter periods of time than other blanchers. In the patented hold section, heat applied to product in the initial stage of blanching is allowed to equalize within the product until the desired core temperature and level of enzyme inactivation are achieved.

The vegetable blancher has been recognized by four awards.

- Putnam Award
- Food Technology Industrial Achievement Award
- Gordon Royal Maybee Award from the Canadian Institute of Food Science & Technology
- Export Achievement Award from Nova Scotia Department of Development

COMPETITIVE POSITION

Many firms manufacture conventional blanching equipment including hot water blanchers and hydrostatic steam blanchers. Only a small handful of firms in Canada, United States and Europe, manufacture high technology, process-controlled blanchers.

ABCO's unique blanching technology provides customers with these benefits –

- High quality of blanch-enhanced retention of colour, flavour and nutrients,
- Controlled energy consumption leading to high energy efficiency, and
- Reduced effluent levels.

In addition, ABCO offers its customers a variety of options and routinely customizes equipment for specific applications.

FUTURE DIRECTION

ABCO plans to build on its design and manufacturing expertise. Two products are currently being commercialized.

- The Fluidice machine makes ice that flows like a liquid and can be pumped through a hose. The ice cools fish up to two times faster than other ice forms without damaging product.
- A custom-built dog fish skinning machine skins both back and belly flaps in one pass.

PARTNERSHIPS SOUGHT

- Opportunities to manufacture or distribute complementary food processing technology developed by foreign firms
- International, sales-oriented distributors

CORPORATE CAPABILITIES

ADVANCED EQUIPMENT INC.

2411 Vauxhall Place
Richmond, British Columbia
CANADA V6V 1Z5

Peter Poo
President

Telephone: (604) 276-8989
Facsimile: (604) 276-8962

MAJOR PRODUCTS/SERVICES

- ***Quick freezing, cooling and cooking equipment***

NATURE OF BUSINESS

Advanced Equipment Inc. designs and manufactures freezing, heating and cooling equipment for the food processing industry.

A sister company, Mar-Con Wire Belt Inc. (Mar-Con), provides belting for Advanced Equipment. Over 80 per cent of the final product is manufactured in-house by Advanced Equipment or Mar-con. Compressors are imported from the United States.

The company trains customers in the use of its equipment and provides ongoing technical support should customers plan to use the equipment for different products.

Advanced Equipment has a network of agents in the United States, Europe and Asia. Exports account for 90 per cent of shipments. Its products are sold directly to food processors in Canada.

Revenue: $2–2.5 million in 1990

Employees: 15

History: 1976 – Mar-Con Wire Belt Inc. is incorporated as a manufacturer of wire belting and sheet metal products, specializing in food applications.

1986 – Advanced Equipment is incorporated as a natural extension of Mar-Con. Two contracts from Ore Ida Foods propel sales to $1 million.

Ownership: Advanced Equipment and Mar-Con is owned and managed by two partners.

MARKET FOCUS

Advanced Equipment's customers are frozen food processors in the fruit and vegetable, meat, poultry, dairy and prepared food sectors and include:

- Corporate Foods,
- Grimms Foods,
- Labatts,
- Ore Ida Foods,
- BC Packers,
- Unisea Foods,
- Con Agra, and
- Quingdao Province, China.

PRODUCT DESCRIPTION

The company's freezing equipment includes tunnel, spiral and plate freezers. About 70 per cent of its sales are freezers. Other products include vegetable steam blanchers and coolers.

Product strengths include:

- High efficiency and reliability;
- Minimal space requirements;
- Ease of maintenance; and
- Stainless steel/aluminum/plastic construction to USDA; FDA and CSA standards.

COMPETITIVE POSITION

- High degree of integration allows Advanced Equipment to easily meet customer needs.
- Strong customer support.
- Twenty years experience in serving the frozen food industry.

FUTURE DIRECTION

- Development of new types of equipment.
- Export focus will shift towards Europe, Taiwan and China.
- Integrated solutions in refrigeration systems will be offered.

PARTNERSHIPS SOUGHT

- Joint ventures with refrigeration companies in the United States and Europe with complementary technologies.
- Investors that are not involved in equipment manufacturing.

CORPORATE CAPABILITIES

BEVCO CONVEYING SYSTEMS

9354-194th Street
Surrey, British Columbia
CANADA V3T 4W2

Terry O'Brien
Sales Manager

Telephone: (604) 888-1455
Facsimile: (604) 888-2887

MAJOR PRODUCTS/SERVICES

- ***Conveyors***
- ***Rinsers, warmers/coolers***
- ***Accumulation tables***

NATURE OF BUSINESS

Bevco Conveying Systems (Bevco) designs, manufactures and distributes custom made equipment for the food and beverage industry. Customer service is an important part of Bevco operations. Sales representatives cover Canada, the United States and Mexico.

Bevco's product range includes conveyors, rinsers, warmer/coolers and accumulation tables.

Revenue: $4 million forecast in 1992, up from an estimated $3 million in 1991.

Employees: 40

History: 1980 – Gus Fortier founds the company to satisfy a specific need to improve conveying equipment in the brewing industry.

1984 – Brian Fortier (son) and Dianne Hargrove (daughter) become partners in the family business as the company grows. Firm moves to Port Coquitlam.

1986 – First cross-Canada orders with Carling Brewery. Establishes a North American presence with agents in Seattle and California. Moves to current premises in Surrey.

1988 – Expands to the food processing market as a need emerges for better sanitation in the food industry.

1989 – Generates first advertisements for Packaging Digest.

Increases product range to include cooling and warming tunnels for pasteurization.

1990 – Introduces hot pack rinser.

1991 – Intraduces a new generation cooling tunnel.

Ownership: Bevco is a wholly Canadian-owned company.

MARKET FOCUS

Bevco's business is 40 per cent export – 30 per cent to the United States and 10 per cent to Asia and Australia.

The food industry represents 50 per cent of Bevco's market, of this 40 per cent is in the beverage market, and the remaining 10 per cent in other consumer products.

Customers include:

- E.D. Smith,
- Campbell,
- Pillsbury,
- Del Monte,
- Carnation,
- Nestlé,
- Lucerne (Safeway), and
- Lever Brothers.

PRODUCT DESCRIPTION

Bevco designs and manufactures a range of products that are custom-built to customer specifications:

Conveyors are Bevco's core business and represent 60 per cent of its sales.

Rinsers cleanse containers before being filled – features are:

- No change parts required;
- Higher drain rates than conventional rinsers;
- Different sizes of products that meet the needs of small and large customers; and
- Hot juice filling is possible using a hot pack rinser.

Warmer/Cooler products change the temperature of containers after filling. Juice bottling is one successful application.

Combiners queue bottles into single-file and orient containers for labelling. Bevco's zero-pressure designs allow many different shapes of containers to be handled.

Elevator/Lowerator moves cantoiners up and down. Less maintenance is required than similar products due to an award winning design.

COMPETITIVE POSITION

- Integrated systems approach.
- High customer satisfaction.
- Products are assembled and marked for easy installation.

PARTNERSHIPS SOUGHT

- Manufacturers that want to produce hot pack rinsers under licence.
- Companies that want to share technology.
- Distributors with Bevco's high standards in customer service.

CORPORATE CAPABILITIES

BLOEMHOF INDUSTRIES (1986) LTD.

12755-64 Street
Edmonton, Alberta
CANADA T5A 0X5

Bert Bloemhof
President

Telephone: (403) 476-2131
Facsimile: (403) 476-7813

MAJOR PRODUCTS/SERVICES

- ***Bakery industry equipment***
- ***Sheeters, moulders and baggers***

NATURE OF BUSINESS

Bloemhof Industries (1986) Limited (Bloemhof) performs R&D and manufactures unique sheeters, moulders and baggers for the bakery industry.

A dealer network sells products and provides after-sales service backed up by Bloemhof's warranties on parts and labour.

Bloemhof's products are sold in Canada, the United States and Australia.
Over 40 per cent of its production is exported.

Revenue: $525,000 – 12 months ending October 1991, up from $480,000 in 1990.

Employees: 7

History: 1963 – Father of present owner starts a business to repair bakery equipment and develop new products to meet local bakery needs.

1972 – Robin Hood begins distributing Bloemhof's equipment in Eastern Canada. Minivert Air Bagger is designed for bagging bread.

1975 – Moves into current premises.

1976-77 – Dealers across Canada start selling Minivert.

1980 – Agreement reached with U.S. company to distribute products.

1981 – Sheeter-moulder are launched.

1985 – Pizza pie shell machines are launched.

1987 – Regional dealer network in the United States is introduced.

Ownership: Mr. Bert Bloemhof and his mother own the business.

MARKET FOCUS

- 95 per cent of Bloemhof's customers are in the retail business.
- Supermarket in-store bakeries, franchised shops, smaller bakeries, hotels and restaurants buy from Bloemhof.

Customers include:

- Safeway,
- Oshawa Foods,
- Bunsmaster,
- I.G.A.,
- Meijer Inc.,
- Mirade Mart,
- Overwaitea Foods,
- Grandma Lee's, and
- Save-on-Foods.

Sales and marketing activities:

Bloemhof has a network of dealers in Canada, the United States, Australia, Central America (Panama, Costa Rica, Honduras) and the Caribbean to sell its products. The company advertises in Baking, Bakery Production and Marketing, and Modern Baking. As well, Bloemhof exhibits its products at Showcase East, Showcase West, and Retail Bakers of America.

PRODUCT DESCRIPTION

Bloemhof's products meet different bakery needs:

Minivert Bagger – For the bagging of bread. The unique vertical bagging allows unwanted crumbs to fall to the floor and eliminates bag-tearing.

Simplex 4-24 Sheeter-Moulders – For the production of bread and rolls. The sheeter-moulders can be easily adjusted to produce donut, danish and puff pastry. Advantages of these units are their sanitary design, versatility, strong construction and durability.

B&B and B&B 860 Bread and Roll Moulders – For producing bread rolls. Benefits are ease of maintenance, robust construction, simple adjustments and durability.

Simplex PR-24 Pizza Roller and PR 14 Bench Sheeters – For producing large pizza shells or pie doughs. Advantages are robust frame construction, versatility and sanitary design.

COMPETITIVE POSITION

- Unique understanding of the needs of the smaller bakery.
- Products matched to customer demands.
- Continuing links with existing customers.
- Established dealer network.

FUTURE DIRECTION

- Exploration of expansion into Central and South America.
- Development of new products such as inexpensive reverse sheeters, slicers and new ways of dividing dough .
- Expansion of production using recently acquired property.
- Exhibition of some units at a "SHOWCASE" bakery in Moscow, Russia.

PARTNERSHIPS SOUGHT

- Investors wishing to back expansion and production on a large scale.
- Distributors willing to promote Bloemhof equipment in Europe.

CORPORATE CAPABILITIES

CHARLAND THERMOJET INC.

471, St-Edmond, B.G. 38
Vassan, Québec
CANADA J0Y 2R0

Léo Charland
President

Telephone: (819) 824-1267
Facsimile: (819) 824-7589

MAJOR PRODUCTS/SERVICES

- ***Specialized steam/water mixing machinery***

NATURE OF BUSINESS

Charland Thermojet Inc. (Charland) manufactures high quality steam and water mixing machinery. Based in Vassan, Québec, the company fabricates, assembles and tests its complete product line in-house. Charland has a sales office located in Montréal that is also responsible for customer service. Products are distributed across Canada and are used mainly by the food and pharmaceutical industries. Municipalities have recently become customers – Charland Thermojet having found many
applications for steam and water mixing equipment in water treatment plants.

Apart from its manufacturing operations, Charland imports and distributes various products from Strahman Valves Inc. (a U.S. company). This import-distribution relationship complements the product line offered by Charland and accounts for 25 per cent of total sales.

Revenue: Approximately $600,000 in 1991

Employees: 8

History: 1977 – Start of a company named John Y. Stanfield – a distributor of steam and water machinery. This company was owned by Léo Charland.

1980 – Start of a company named Léo Charland et fils Inc. – a manufacturing company selling to John Y. Stanfield Inc.

1987 – Founding of Charland – replacing John Y. Stanfield Inc. and Léo Charland et fils.

Printed in Canada 08/94

MARKET FOCUS

The food and pharmaceutical industries represent over 80 per cent of Charland Thermojet sales. The remaining 20 per cent is divided between municipalities and various industry sectors. A well thought out product line, backed by a high level of service, has attracted an impressive list of customers including:

- Kraft General Food,
- Natrel,
- Catelli,
- Saputo,
- Merck Frosst,
- Petro-Canada,
- Squibb, and
- Shell Canada.

PRODUCT DESCRIPTION

Charland has a complete line of mixing equipment for a variety of applications: low and high pressure, with or without soap, steam and water, hot and cold water.

Charland Thermojet mixers are principally composed of two valves: one to supply steam, the other cold water. When the steam and water are blended through the control valves, hot water is produced immediately.

Designed and engineered with simplicity in mind, all units are easy to use and highly efficient. When operating, the desired temperature is held, even after the water gun is closed.

Advantages:

- Saves energy as well as water and lost steam.
- Automatically closes if there is water trouble, or a higher temperature is needed.
- Won't exceed the limit of 200°F (92°C).
- Handles steam pressure at 40 to 90 lbs; water at 50 lbs. minimum.

Applications include agriculture, farms, refineries, slaughter houses, transportation, chemical products, dairy products, food products. Also available is a full range of hot water guns and nozzles of various sizes and shapes for specialized applications.

FUTURE DIRECTION

Charland is currently developing a new industrial water pistol with innovative features as well as a high-capacity hot water mixer to fill large tanks for chemical products and pulp and paper plants. Also under development – a new model to make hot water for food and special applications.

PARTNERSHIPS SOUGHT

- Partners that want to distribute Charland products, especially those with complementary lines suitable for distribution by Charland.
- Financial investment in new engineering ideas/products or in the company itself.
- Distributor arrangements in Europe and in the United States.

CORPORATE CAPABILITIES

CHARLOTTETOWN METAL PRODUCTS

P.O. Box 323
Charlottetown, Prince Edward Island
CANADA C1A 7K7

Wendell MacDonald
General Manager

Telephone: (902) 566-3044
Facsimile: (902) 566-1856

MAJOR PRODUCTS/SERVICES

- ***Vegetable processing equipment***
- ***Fish processing and handling equipment***
- ***Mussel processing equipment***
- ***Liquid handling and storage equipment***

NATURE OF BUSINESS

Charlottetown Metal Products (CMP), a division of Maritime Steel and Foundries Limited, designs and manufactures, vegetable processing equipment, fish processing and handling equipment, and liquid handling and storage equipment. CMP's diversified product line has enabled the firm to expand its market west to the Great Lakes region from its traditional Canada/U.S. eastern seaboard market.

CMP's vegetable processing and handling equipment includes a complete line of vibratory conveyors that are capable of product transfer, grading, de-watering, washing and glazing. CMP offers lines of integrated equipment including tote and drum dumpers, cluster busters, and belt, screw and bucket conveyors.

Among CMP's fish processing equipment are processing lines, individual plants and on-board equipment. Of particular note is CMP's complete mussel processing line designed for the aquaculture industry in Atlantic Canada.

Revenue: Approximately $3 million in 1991

Employees: 20

History: 1956 – CMP incorporates in PEI to make highway culverts.

1962 – Begins developing and manufacturing processing equipment for the fishing industry.

1970s – Begins manufacturing vegetable processing equipment.

1980s – Begins manufacturing liquid processing equipment.

1991 – CMP becomes a division of Maritime Steel and Foundries Limited. New management team is recruited with a strong background in food processing.

Ownership: CMP is 100 per cent owned by Maritime Steel and Foundries Limited of Nova Scotia.

Printed in Canada 08/94

MARKET FOCUS

CMP has captured approximotely 75 per cent of mussel processing equipment market in eastern Canada.

CMP customers include vegetable and fish processors such as:

- McCain Foods,
- Humpty Dumpty,
- National Sea Products,
- Thimble Bay Mussel Farms,
- Hostess Frito-Lay,
- Cavendish Farms, and
- Seafreez Foods.

Sales and marketing activities:

CMP markets its products and services through a direct sales force of three people. CMP attends trade shows including Fish Canada, and the National Food Processors Association Show in the United States.

PRODUCT DESCRIPTION

CMP's range of vegetable handling and processing equipment features a line of sturdy vibratory conveyors. CMP has experience in computerized vegetable mixing systems that work to close tolerances. The company has implemented Computer Aided Design – thereby improving design efficiency and accuracy. Individual components can be integrated to provide partial
process lines for such products as french fries, potato chips, peas, carrots and extruded products.

CMP's vibratory conveyors provide:

- High absorption of excess energy that minimizes damage to other equipment and lengthens product life.
- Quiet operation.

CMP offers fish handling and processing equipment such as cutting, packing, candling, trimming and selection tables, as well as washers, conveyors and cookers. CMP is noted for shellfish equipment which is capable of handling mussels, crab, lobster and scampi.

FUTURE DIRECTION

CMP intends to expand its vegetable processing and handling equipment beyond its current 50 per cent share of company shipments. In addition, CMP plans to design and manufacture liquid handling and storage systems for the brewery, winery, carbonated beverage and confectionery industries.

PARTNERSHIPS SOUGHT

Charlottetown Metal Products seeks alliances with European or international firms to manufacture, assemble and sell foreign designed complementary vegetable processing equipment for the North American market.

CORPORATE CAPABILITIES

DIPIX TECHNOLOGIES INC.

The Baxter Centre
1050 Baxter Road
Ottawa, Ontario
CANADA K2C 3P1

Donald W. Evers
Chairman and CFO

Telephone: (613) 596-4942
Facsimile: (613) 596-4914

MAJOR PRODUCTS/SERVICES

- ***Electronic imaging and detection***

NATURE OF BUSINESS

The business of Dipix Technologies Inc. (Dipix) is based on digital electronic imaging. Dipix offers electronic imaging products and services in the areas of microscopic imaging, remote sensing, circuit boards and industrial systems.

Dipix designs, assembles and sells an innovative microscopic imaging instrument that is fast, automatic, accurate and inexpensive. Customers in the milling and baking industries now can obtain quantified images quickly – permitting the detection of bran contamination, starch damage and particle size in cereal grains. The instrument also has application in many markets beyond the food sector.

Products and services are supported with training and maintenance. Dipix successfully commercialized a new microscopic imaging instrument using technology secured from Carlsberg Research in Denmark. As well, the firm was awarded a $1.3 million industrial systems contract by Bank of Canada to supply a bank note inspection system using similar technology.

Revenue: $4.3 million in 1990

Employees: 35

History: 1976 – Dipix begins doing business in electronic imaging.

1988 – Begins research and development of microscopic imaging instrument.

1991 – Begins delivering microscopic imaging equipment.

Ownership: Dipix is a 100 per cent Canadian-owned firm with 61 per cent being held by two partners, including Donald Evers, Chairman and CFO; 29 per cent is held by Dipix employees; and 10 per cent is held by Innovation Ontario.

MARKET FOCUS

Current customers for microscopic imaging include:

- General Mills,
- ConAgra,
- Cargill, and
- Nabisco.

Printed in Canada 08/94

PRODUCT DESCRIPTION

The Dipix micrascopic imaging instrument consists af an image input device, image pracessor, measurement display, and a communicatians cantraller plus praprietary saftware.

A videa camera is maunted an a commercially available micrascope and the images seen by the camera are then displayed an a calour manitar. The captured image data is pracessed/analysed by the DIPIX P360 Pawer Grabber Baard which is sald by Dipix's Baard Divisian.

Measurement functians are provided by a cambinatian af aff-the-shelf hardware such as the microscape and custam hardware/saftware. Dipix uses a patented auto-fluarescence methadalagy far cereal grain detectian. Currently, the instrument has several measurement applicatians far the detectian af:

- Bran contaminatian in wheat and aats;
- Particle size; and
- Starch damage.

COMPETITIVE POSITION

Dipix competes with manufacturers af near-infra-red detectian products and ather micrascapic imaging devices. Dipix technalagy provides advantages aver ather technalagies with:

- Fast and accurate measurements;
- Law cast – Dipix prices range fram $11,000 ta $30,000 U.S., whereas competing praducts cast $70,000 ta $100,000;
- Madular design capable af adaptatian ta custamer requirements;
- Simplicity af aperatian – measurements can be taken by praduction warkers; and
- Results and scientifically verifiable.

FUTURE DIRECTION

Dipix plans ta graw thraugh its invalvement in the micrascapic imaging market. In this market, Dipix praiects sales revenues af $30 millian between 1992 and 1994.

Dipix engineers are currently examining apportunities far additianal applicatians af micrascapic and macrascapic imaging. Pramising applications in microscapic imaging include beta glucans in wheat, fibre content and wheat germ; while macroscapic imaging has patential in machine visian af pastry, bread lines, waad chips, etc.

PARTNERSHIPS SOUGHT

Dipix seeks partners to participate in its future growth. Specific interests include:

- Equity investment;
- Licensing Dipix technalagy abraad;
- Jaint ventures to expand applicatians, and
- New distributian channels.

CORPORATE CAPABILITIES

GLOBAL MARINE PRODUCTS LTD.

13 Acadia Street
Dartmouth, Nova Scotia
CANADA B2Y 2N1

K.W. (Keith) Colwell
President

Telephone: (902) 463-0060
Facsimile: (902) 464-9753

MAJOR PRODUCTS/SERVICES

- ***Food smokers***
- ***Longline equipment***

NATURE OF BUSINESS

Global Marine Products Limited (Global) custom designs, manufactures, and sells food smokers that range from simple systems to sophisticated, microprocessor controlled units. Sold across North America, Global's food smokers provide a true hot or cold smoke and are suitable for a wide range of applications including fish, shellfish, meat, poultry, game, eggs and cheese.

Having its roots in the fishing industry, Global also continues to design, manufacture and sell a variety of fishing equipment focused on the longline fishing industry. Global supplies fishing equipment customers worldwide, with half of its shipments going to export markets. A joint venture with the French firm VMC Pêche SA supports the fishing equipment side of Global's business.

Revenue: $1 million in 1990

Employees: 11

History: 1974 – K.W. Colwell begins operating a general machine shop.

1981 – Global is incorporated in Nova Scotia.

1983 – Global enters into a joint venture with a French firm to establish VMC Pêche Canada Ltd.

1984 – Global begins to manufacture and sell smoking equipment.

Ownership: Global is a 100 per cent Canadian firm owned entirely by its president, Keith Colwell.

Printed in Canada 08/94

MARKET FOCUS

Global supplies smokers and longline equipment to export and domestic markets. The firm sells its products directly to customers and through a sales agent in the United States. It exhibits at a variety of trade shows including Seattle Fish Expo (U.S.), Boston Fish Expo, and several other maritime shows in Canada and the U.S.

As well, Global won an Export Achievement Award in 1988 from Nova Scotia; and has been certified as a NATO supplier (AQAP4 from the Allied Quality Assurance Program).

PRODUCT DESCRIPTION

Global food smokers are available in standard models including 25 kg, 40 kg, 150 kg, 250 kg, 500 kg; as well, larger models with over 3000 kg capacity are available. This size range makes Global's food smokers suitable for many enterprises including fish plants, fish/game/poultry farms, hotels, restaurants, delicatessens, butchers and even homes.

Hollow wall construction creates air circulation to maintain a cool oven for cold smoking. Heat for hot smoking is provided by thermostatically controlled stainless steel clad electrical elements. Smoke is produced by burning hardwood shavings and sawdust in fuel boxes at the base of the smoker.

COMPETITIVE POSITION

Global food smokers are of high quality construction and can:

- Handle a wide range of products including many fish and shellfish (mussels, eel, salmon, trout, mackerel); and
- Be custom designed (CAD/CAM introduced in 1986) in a wide range of capacities at minimal cost.

PARTNERSHIPS SOUGHT

- Technically-oriented manufacturers and representatives worldwide.
- Alliance with foreign firm to manufacture or market Global's products abroad.
- Licence to manufacture, assemble or distribute complementary food processing or packaging equipment in Canada.

CORPORATE CAPABILITIES

NEPTUNE DYNAMICS LIMITED

6751 Graybar Road
Richmond, British Columbia
CANADA V6W 1H3

J. Richard Green
President

Telephone: (604) 244-9836
Facsimile: (604) 244-9771

MAJOR PRODUCTS/SERVICES

- ***Herring sex discriminator***
- ***Can sampler***
- ***Roe herring opener***
- ***Data acquisition for QA/QC for food processing***

NATURE OF BUSINESS

Neptune Dynamics Limited (NDL) is an owner-managed company that designs, manufactures, sells and services equipment for the fish processing and canned foods industries. Products are sold all over the world through agents in the Netherlands, Britain and Japan. NDL also sells and services other manufacturers' equipment.

Revenue: Estimated at $750,000 for the year ending April 1992, up from $500,000 in 1991.

Employees: 10

History: 1974 – NDL begins as an outgrowth of a consulting engineering company. Develops herring sex discriminator.

1981 – Fishing industry declines, NDL focuses on energy conservation.

1985 – Demand from Eastern Canada leads to reintroduction of herring sex discriminator. Technological breakthrough enables different sizes of East coast herring to be discriminated.

1987 – Converts herring sex discriminator from analog to digital scanning, resulting in an increase of accuracy from 98 per cent to 99.9 per cent. Automatic can sampler developed.

1987-90 – Can samplers sold to all major West Coast salmon packers.

1989-91 – Exports herring sex discriminator to the Netherlands, Germany, Japan, Scotland, Ireland and Alaska.

1990-91 – Explores opportunities for can sampler among British Columbia vegetable processors.

1991-92 – Explores opportunities for can sampler to solve canning problem in China.

1991-92 – Develops Roe Herring opener with industry consortium.

Printed in Canada 08/94

MARKET FOCUS

NDL has developed equipment to meet specific market demands.

- Herring sex discriminator enables processors to automatically identify the more valuable female herring.
- Automatic can sampler isolates cans with a high probability of defect.

Sales and marketing activities:

- NDL exhibits at trade shows, such as Fish Expo in Canada and Europe; and,
- NDL sells directly to fish processors. It operates mainly through test installations and demonstrations.

PRODUCT DESCRIPTION

NDL products are unique. The company claims to have limited direct competitors.

Herring sex discriminator equipment allows processors to sort the more valuable female fish from the male.

- Microprocessor technology accurately examines each fish.
- Up to 300 fish per minute are examined.
- Can be used to sort herring from different parts of the world.

The computerized can sampler is designed to inspect and separate cans that are most likely to have defects.

- Increased productivity – fewer manual inspections.
- Improved quality of product.
- Simple, reliable operation.

NDL won two awards in 1975 for the design of its original herring sex discriminator.

- Governor General's Award for Excellence in Design.
- Award of Excellence from the Consulting Engineers of Canada.

FUTURE DIRECTION

NDL continues to invest in research and development. Current plans call for it to focus on:

- New products using NDL data-acquisition technology;
- New markets (such as Japan and Russia) for the herring sex discriminator; and
- Other can sampling products.

PARTNERSHIPS SOUGHT

- Joint venture with a manufacturing company that could apply NDL technology to other problems.
- Partners that are interested in improving the quality of canned foods including all types of food processors and distributors.

CORPORATE CAPABILITIES

NORDION INTERNATIONAL INC.

447 March Road
P.O. Box 13500
Kanata, Ontario
CANADA K2K 1X8

Peter Kunstadt
Manager, Food Irradiation Applications

Telephone: (613) 592-2790
Facsimile: (613) 592-6937

MAJOR PRODUCTS/SERVICES

- ***Food irradiation equipment***

NATURE OF BUSINESS

The business of Nordion International Inc. (Nordion) is based on gamma radiation technology. Nordion was the pioneer, and continues to be the world leader, in the design, manufacture, installation and servicing of research and commercial irradiation facilities. It also supplies equipment and isotopes. Nordion holds over half of the world market for irradiation facilities and supplies 92 per cent of the world's Cobalt 60, the primary source of gamma radiation. Nordion's products have many applications: to preserve food and combat food-borne disease; to diagnose and treat illness; and to sterilize surgical and medical supplies. Irradiation is a safe method of treating food with applications that include inhibiting sprouting in potatoes, onions and garlic, destroying insects in spices and other seasonings, and reducing microbial loads in meat, poultry and seafood. Nordion operates three processing facilities, two in Canada and one in Europe. Kanata Operations and Nordion Europe both develop, produce and market reactor-produced isotopes and related equipment. Vancouver Operations manufactures cyclotron-produced radioisotopes.

Revenue: $107.6 million in 1990

Employees: 400+

History: 1946 – Begins marketing radium as the Commercial Products Division of Eldorado Mining and Refining Limited, a Crown corporation.

1951 – Installed the world's first Cobalt 60 cancer therapy machine.

1952 – Ownership of Commercial Products Division transferred to Atomic Energy of Canada Limited, another Crown corporation.

1964 – Delivers first commercial irradiator.

1987 – Canadian Certificate of Export Achievement award.

1988 – The Government of Canada announces plans to sell company. Name changes to Nordion International Inc.

1990 – Establish office in Hong Kong and manufacturing/processing facility in Belgium.

1991 – Nordion acquired by the Canadian firm, MDS.

Ownership: Nordion is a wholly owned subsidiary of MDS Health Services Ltd.

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MARKET FOCUS

Nordion supports a network of 40 sales agents worldwide. Sales representatives in Canada, Belgium and Hong Kong assist and train agents, as well as sell directly to customers.

Members of Nordian's marketing team continually author articles and present papers in an effort to educate potential customers and develop new markets. Nordion also provides a variety of informative marketing materials.

PRODUCT DESCRIPTION

Nordion's food irradiators provide food treatment comparable to heat pasteurization, canning or freezing. The process involves exposing food, either packaged or in bulk, to ionizing energy such as gamma rays. The source of gamma rays for food processing is the radio-isotope cobalt 60.

Cobalt 60's gamma energy can penetrate food causing, as in cooking, canning or freezing, small harmless molecular changes to the food. Irradiation disrupts the organic processes that lead to food decay. Energy from gamma rays are absorbed by food molecules. In the process, microbial cells, such as bacteria, yeasts and moulds are broken down, and parasites, insects or their eggs and larvae are either killed or made sterile.

COMPETITIVE POSITION

Nordion already commands over half of the world market for irradiators. As of March 1991, Nordion designed and manufactured 87 of the 170 gamma processing facilities in operation around the world. Of these, about 25 gamma processing facilities irradiate food. Nordion's success is based on:

- Ongoing research and development into new irradiation applications; and
- Four decades of experience with more than 1,000 customers in over 100 countries.

FUTURE DIRECTION

Nordion continues to work on finding and perfecting new, beneficial applications for its technology. These include:

- New ways to improve food preservation and enhance food quality;
- Early detection of disease and improved treatment of tumours;
- Sewage treatment; and
- Integrity testing for materials and components of large structures.

Nordion is also optimistic that the EC may soon harmonize policies on food irradiation and that this initiative will open new markets for irradiators.

PARTNERSHIPS SOUGHT

- Joint ventures to operate irradiation facilities, in eastern Europe, South America, Asia and elsewhere.

CORPORATE CAPABILITIES

O'HARA MANUFACTURING LIMITED

65 Skagway Avenue
Toronto, Ontario
CANADA M1M 3T9

Gil O'Hara
President

Telephone: (416) 265-1800
Facsimile: (416) 265-6658

MAJOR PRODUCTS/SERVICES

- ***Tablet coaters***
- ***Ovens, mixers, kettles, mills, tanks***

NATURE OF BUSINESS

O'Hara Manufacturing Limited (O'Hara) designs, manufactures and distributes equipment for the pharmaceutical, food and confectionery industries. O'Hara also provides training and extensive customer service. Tablet coating equipment is its core business. O'Hara is now one of six manufacturers of tablet coating equipment worldwide.

Revenue: $2 million in 1990

Employees: 12–15

History: O'Hara was incorporated in 1976 with the specific objective of developing or acquiring the technology for coating tablets. Related objectives were to design and manufacture the necessary equipment.

MARKET FOCUS

Exports account for 50 per cent of O'Hara's sales. A recent order from Venezuela is one example. Markets include the pharmaceutical and food industry. Target customers in the food sectors are candy manufacturers and sugar coaters. Its customer list in both pharmaceuticals and food is impressive.

- Upjahn
- G.D.Searle
- Merck Frosst
- Sandoz
- Marion Merrell Dow
- Hershey
- Warner Lambert
- Nabisco
- Rowntree Mackintosh

Printed in Canada 08/94

PRODUCT DESCRIPTION

Tablet coaters range in size from 5 kg to 1000 kg and can be custom designed to specification. Current models incorporate touch sensitive screens for automatic semi-computer, P.L.C. or other computer operated systems.

Other equipment that O'Hara manufactures include:

- Ovens,
- Kettles and process mixers,
- Plow mixers,
- Mills, and
- Tanks.

COMPETITIVE POSITION

O'Hara's competitive advantage lies in its quick response and competitive pricing. Some of its competitors are larger, but O'Hara has less overhead and is able to react more quickly to customer demands. O'Hara trains customers and provides the manuals needed for effective equipment operation.

FUTURE DIRECTION

O'Hara plans to further penetrate and expand its global markets. Expansion into Europe is a major objective. O'Hara plans to export at least 80 per cent of its output within five years.

PARTNERSHIPS SOUGHT

O'Hara is interested in joint ventures with companies that would like to distribute its equipment. Similarly, O'Hara is willing to act as a distributor of any potential partners' products to the North American pharmaceutical and food industries.

CORPORATE CAPABILITIES

QUADRO ENGINEERING INC.

613 Colby Drive
Waterloo, Ontario
CANADA N2V 1A1

Eddie H. Koch
President

Telephone: (519) 664-3724/844-9660
Facsimile: (519) 884-0253

MAJOR PRODUCTS/SERVICES

- ***Size reduction mills***
- ***Wet mixers***
- ***Vacuum conveyors***

NATURE OF BUSINESS

Quadro Engineering Inc. designs, manufactures and markets an innovative line of size reduction mill for use in food processing, pharmaceutical, fine chemical and cosmetics applications. Quadro's conical screen mill, Comil® , accomplishes size reduction quietly, with low heat and dust, and is easy to clean. Quadro also manufactures and markets Quadro-Ytron® , a wet mixer, and Quadro- Vac®, a line of vacuum conveyors.

Quadro has design engineering expertise for continuous product development and the product customization that is necessary for most customer applications. Quadro operates a state-of-the-art manufacturing facility in Waterloo and a modern testhouse in St. Jacobs.

Revenue: Approaching $10 million

Employees: 75 worldwide

History: 1976 – Quadro Engineering Inc. begins to develop, manufacture and sell the Comil.

1982 – Quadro Process Inc. is established as a wholly owned sales and marketing company.

1982 – Quadro Ytron (U.K.) Ltd., a joint venture, is established in England to market and sell Quadro products in the U.K. and the continent.

1983 – Quadro Inc. is established in New Jersey to market and sell Quadro products in the United States.

Ownership: Quadro Engineering Inc. is a 100 per cent Canadian, family owned business.

Printed in Canada 08/94

MARKET FOCUS

Quodro has established o worldwide network of representotives ond importers. Its customers include mony of the world's lorgest food, chemicol, cosmetic ond phormoceutical componies:

- Conodo Pockers,
- Hershey Chocolote Co.,
- Nobisco,
- Westons Ltd.,
- Mople Leof Mills,
- Dore Foods,
- Kelloggs Solodo,
- Quoker Oots Ltd.,
- Kroft Generol Foods, ond
- Soro Lee.

Soles ond morketing octivities:

Quodro sells its products in North America through 21 independent monufocturers' representotives. It olso mointains its own soles representotives in critical morkets. Outside of North America, Quodro sells its products to 17 importers thot re-sell to customers in regionol morkets. Quodro's exports ocross Europe, Jopon, Austrolio, New Zeolond, Isroel, Soudi Arobio, Venezuelo, Egypt, Koreo, Chino, Kuwoit, South Africo, Centrol/South America ond Mexico.

Quodro provides extensive support to its importers, representotives ond direct soles force. It hos o five port strotegy.

Key occount penetrotion – provides informotion to the field on soles octivity in key occounts worldwide.

Trode shows – including Achemo in Germony; Interplex in the United States, United Kingdom, Netherlonds, Jopon; Powder & Bulk Solids in Chicogo; regionol Toble Top shows.

Advertising – in Food Engineering (U.S.); Food Monufocturing (U.K.); Chemicol Processing (U.S.); Phormoceutical Technology (U.S. ond internotionol).

Professionol development – Quodro engineers ottend industriol seminors ond technicol soles seminors to leorn ond to network with other professionols in the field, ond in turn pass this informotion to their representotives.

Involvement in educotionol institutions – for exomple, Quodro supported o pilot plont ot Rutgers University, N.J. where students can become fomilior with Quodro technology.

PRODUCT DESCRIPTION

Quodro Comil's perfomonce results from the combinotion of low-velocity operotion ond speciolized geometry of the milling components. Moteriol to be processed enters the top of the Comil ond folls into the conicol screen chomber. The rototing impeller forces porticulotes to the screen surfoce. Here portides ore reduced in size ond instontly dischorged through the screen openings.

Quodro Comil food opplicotions include:

- Grinding heot-sensitive chocolote bors, creme-filled biscuits or sticky condy for reclomotion;
- Mixing ond dispersing fotty powder mixes; ond
- Gentle delumping of soft, eosily domoged, dried fruit oggiomerotes.

Comil features include:

- Low heot, low dust, low noise operotion;
- Uniform, controlled, reproducible portide size distribution; ond
- Eose of operotion ond deoning.

Quodro-Voc is o vocuum conveying system for o wide variety of dry moteriol opplicotions. It is sonitory ond provides o cleoner workploce.

Quodro-Ytron is on oxiol jet mixer thot reploces the rodiol octon of troditionol mixers. Customizotion of the Quodro-Ytron con creote on effective emulsifier or dispersion unit. The Quodro-Ytron is monufoctured by Quodro Engineering under licence for the North American morket.

COMPETITIVE POSITION

Although very few componies worldwide monufocture conicol mills, mony moke size-reduction equipment. Quodro serves o niche morket with on innovotive design thot is very effective for the opplicotions for which it wos designed.

Quodro's competitive odvontoge tokes the form of product effectiveness, customizotion, service beyond expectotion ond o focus on long-term relotionships with its customers.

PARTNERSHIPS SOUGHT

- Portners oble to license, monufocture ond morket unique foreign technology for the food, phormoceutical ond fine chemicol industries.
- Joint ventures to monufocture ond morket Quodro products outside of Conodo.

CORPORATE CAPABILITIES

SCHMIDT FARMS

Box 99
Maple Creek, Saskatchewan
CANADA S0N 1N0

Arnold Schmidt
President

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Facsimile: (306) 666-4838

MAJOR PRODUCTS/SERVICES

- **Flour Milling**

NATURE OF BUSINESS

Schmidt Manufacturing is a division of family owned and operated Schmidt Farms, which designs and manufactures a revolutionary new flour mill. All design work is conducted in-house, and virtually all parts are manufactured and assembled in the company's plant. A related division, Schmidt Flour, produces and markets whole wheat flour processed from organically grown grain for customers in Canada and the United States.

Revenue: Schmidt Flour has estimated sales of $500,000. The Schmidt Mill is at the prototype stage.

Employees: 4

History: 1982 – The Schmidt family begins research on various milling technologies.

1983–87 – The Schmidt Mill is continuously refined over this period. Sales of Schmidt Flour through retail outlets begins. A milling, storage, and packaging plant is constructed at the Schmidt Farm. Flour sales approach $750,000 per annum.

1988 – The Schmidt flour plant, including the operating mill prototype, is destroyed by fire. Flour sales are set back considerably.

1989–92 – The Schmidt flour plant and operating mill prototype are completely reconstructed. Flour sales are re-established. A new optional addition to the mill makes the production of unbleached flour simple, part of the one step process.

Ownership: Schmidt Farms and its divisions, Schmidt Flour and Schmidt Manufacturing Inc., are completely family owned and operated. All financing has been provided by the Schmidt family.

Printed in Canada 08/94

MARKET FOCUS

Schmidt Farms' initial emphasis was the production and marketing of Schmidt Flour, which is processed from grain that is organically grown on-site. The flour uses no preservatives and is processed from grain grown without the use of pesticides and herbicides. The quality of the flour has generated interest in Schmidt's milling technology from Robin Hood in Canada, as well as from companies in African countries, the United States and Europe.

Schmidt Flour is purchased by customers such as:

- Nutter's Fruit and Nut Co. Ltd.;
- Fisheries Resource Development Limited: A National Sea Products Subsidiary Company;
- Kirkland and Rose; and,
- Numerous bakery clients throughout Canada and the United States.

PRODUCT DESCRIPTION

The Schmidt Mill utilizes a simple one step process requiring only a compact mill to produce fine uniform flour from a variety of grains and legumes. Whole grain is gravity fed into the hopper and is then forced into the milling chamber by a hydrostatically controlled conveyor. The grain is exposed to micronizers for less than three seconds before it is expelled from the chamber ready for bagging and use. With the new optional addition to the mill, unbleached flour can be produced without increasing milling time. With the regular process, no components are removed from the flour and there is no loss of nutrients. One hundred per cent of the grain is processed and returned as whole wheat flour.

Schmidt Manufacturing Inc. has designed and produced operating prototypes of five models of the mill, which operate on 5, 10, 15, 40, and 60 horsepower motors. The 5 horsepower model retails for $6,500 and produces 90 kilograms of fine grade flour per hour, while the 60 horsepower version sells for $105,000 and produces 907 kilograms of fine flour per hour.

In 1985, Schmidt Farms was presented with the Marketing Export Award by the Canadian and Saskatchewan governments.

COMPETITIVE POSITION

The Schmidt Mill offers many benefits over conventional milling technology:

- Speed and efficiency – one-step process, compared with the 14 actions required in conventional roller milling.
- Modular expansion – the addition of units in series allows phased increases in capacity.
- Simple design and low maintenance – few parts to wear out, and those that do can be easily replaced.
- Versatile processing – can handle any dry grain or legume without adaptation.
- Flexible granularity – coarse or fine grades can be milled by varying mill speed and changing screens.

FUTURE DIRECTION

With its flour business re-established and mill prototype restored following the 1988 fire, Schmidt Farms will place an increasing emphasis on marketing its milling technology. The Schmidt Mill's many benefits make it an ideal product for developing countries including Eastern Europe. Its low cost and compact size also make it a logical choice for North America's increasingly competitive industry as well as the growing demand for whole grain products. Schmidt Manufacturing Inc. can now supply complete turnkey units of all the mill prototypes. This includes all operational equipment required and a building if desired.

PARTNERSHIPS SOUGHT

Schmidt Farms is looking for partners to provide the capital required to start large scale production of the Schmidt Mill. The firm is also interested in licensing its technology to foreign manufacturers.

CORPORATE CAPABILITIES

SMALL BROTHERS EVAPORATORS

3811 Main Street
P.O. Box 160
Dunham, Québec
CANADA J0E 1M0

Steve Selby
President

Telephone: (514) 295-2451
Facsimile: (514) 295-2174

MAJOR PRODUCTS/SERVICES

- ***Maple syrup processing equipment***

NATURE OF BUSINESS

Small Brothers Evaporators manufactures high quality processing equipment specifically for the maple syrup industry. The equipment is totally manufactured and assembled in Dunham, Quebec.

Small Brothers Evaporators provides installation services for all of its product line. A large inventory of replacement parts ensures customers' needs are met during the short production period in spring.

Revenue: Estimated $4–5 million in 1991

Employees: 23 – Office (5); production (19)

History: 1889 – Creation of the company by Reid and Stephen Small.

1928 – Purchase of the company by Mr. Oscar C. Selby.

1947 – Purchase of the company by Mr. Rowland Selby.

1984 – Creation of U.S. division called Small Brothers U.S.A. Inc.

The company has a division in Vermont to manufacture and distribute maple syrup processing equipment for the U.S. market, which generates half of the firm's revenue.

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MARKET FOCUS

Small Brothers Evaporators manufactures a full range of products specifically designed for the maple syrup industry. Very few products are adaptable to other sectors of the food industry.

Typical customers are:

- Maple syrup producers;
- Co-operatives in Québec;
- Water treatment companies; and
- Juice manufacturers.

Recently, the company has been working on an export project to Norway – supplying all of the processing equipment to produce birch syrup on a large scale.

Small Brothers Evaporators sells 85 per cent of its production through distributors – 65 in Canada and 40 in the United States.

PRODUCT DESCRIPTION

Small Brothers Evaporators manufactures nearly everything that is needed by maple syrup producers, from sap extractors to bottling equipment. The company specializes in manufacturing a wide range of evaporators that are designed for low energy consumption. Made of high quality stainless steel, evaporators can accommodate wood, oil, natural gas or a combination of these sources of energy.

Some examples of the products manufactured by Small Brothers Evaporators include:

- Stainless steel containers and pans;
- Evaporators;
- Reverse osmosis machines;
- Bottling equipment; and
- Filtering equipment.

PARTNERSHIPS SOUGHT

- New applications for the evaporators (like birch syrup in Norway).
- Financial investments into engineering ideas/products or in the company itself.
- Distribution arrangements in Europe and the United States.

CORPORATE CAPABILITIES

STATIFLO INC.

2175 Sheppard Avenue East
Willowdale, Ontario
CANADA M2J 1W8

Donald Ewing
President

Telephone: (416) 756-2406
Facsimile: (416) 490-6937

MAJOR PRODUCTS/SERVICES

- ***Static mixers***

NATURE OF BUSINESS

Statiflo Inc. designs and sells motionless mixers to companies in process industries and to original equipment manufacturers. Statiflo's unique, patented design for motionless mixing is an inexpensive alternative to traditional dynamic mixing. It saves energy and is maintenance-free because it has no moving parts.

Statiflo subcontracts manufacturing to local shops. Product is manufactured in Canada for North American customers; and manufactured in the United Kingdom for European and other foreign customers.

Revenue: $2 million in 1990

Employees: 11 – (Canada 3, United Kingdom 8)

History: 1972 – Began as licensed distributor of a U.S. designed static mixer.

1978 – Developed unique, new design for static mixer in response to a customer request.

1980 – Incorporated as Statiflo Inc. in Ontario and began selling static motionless mixers.

1983 – Established Statiflo (U.K.) Ltd.

1985 – Registered patent in Canada and the United States.

1986 – Registered patent in Europe.

Ownership: Majority ownership held by Donald Ewing, President, Statiflo Inc, with minority interest held by John Baran, Statiflo (U.K.) Ltd.

MARKET FOCUS

Stotiflo has established Europeon operations in the United Kingdom ond o network of 22 soles ogents in 10 countries. The firm has sold over 20,000 units worldwide to customers.

- British Sugor
- Corgill
- Labotts Brewery
- Conodo Pockers
- Heineken Brewery
- Mors
- Codbury
- CPC
- Hirom Wolker
- Conbro Foods
- Generol Foods
- Chlorox

Soles ogents ore locoted in:

- Conodo (8),
- United Stotes (6),
- Netherlonds,
- Germony,
- Sweden,
- Toiwon,
- Singopore,
- Austrolio,
- South Koreo, ond
- Jopon.

Morketing octivities include:

- Advertising in trode journols (Conodo ond U.K.);
- Direct moil; ond
- Trode shows (Eurochem ot Birminghom, England; Achemo ot Fronkfurt, Germony).

PRODUCT DESCRIPTION

The bosic element of o Stotiflo motionless mixer is o cylindricol helix. Several helicol mixing "elements" ore orronged, ot right ongles, into o "bundle" ond fitted inside o cylindricol housing. Moterials (fluids or solids) passing through the motionless mixer ore processed by following the element geometry.

The mixer hos o voriety of food opplicotions.

- Mixing ond blending
- Dispersion ond emulsion formotion
- Addition of flovour ond colouring
- Syrup dilution
- Morblizing – creoting "loyer effect"

Stotiflo motionless mixers ore ovoiloble in diometers ronging from 13mm to 1.7m, in o voriety of moteriols including hostelloy, titonium, stoinless steel, corbon steel, plostics, teflon ond fibregloss. Stotiflo's mixer provides customers with the following benefits:

- No moving ports, mointenonce-free operotion;
- Low energy consumption;
- Low copitol cost;
- Completely sealed system ond minimol spoce requirements; ond
- Predictoble blending ond dispersion formotion, improved process control ond product quolity.

COMPETITIVE POSITION

Stotiflo is the only Conodion firm omong four, worldwide, thot designs ond monufoctures motionless mixers in Conodo. Product odvontoges ore:

- An innovotive potented design thot ollows for the efficient monufocture of mixers with lorger diometers; ond
- Flexibility ond responsiveness to customers' needs for the mixing of different moteriols.

PARTNERSHIPS SOUGHT

- Foreign componies with existing morket penetrotion ond knowledge in their own countries.
- Foreign componies wishing to license Stotiflo technology.
- Fobricotors copoble of monufocturing Stotiflo mixers in o voriety of moteriols.
- Componies or institutions wishing to undertoke joint R&D.

Food Packaging and Processing Equipment – Research Capabilities

RESEARCH CAPABILITIES

FOOD PROCESSING DEVELOPMENT CENTRE

P.O. Box 3476
6309-45 Street
Leduc, Alberta
CANADA T9E 6M2

Dr. Roberta Myhara

Telephone: (403) 986-4793
Facsimile: (403) 986-5138

NATURE OF RESEARCH

The Food Processing Development Centre (FPDC), a branch of Alberta Agriculture, is situated at Leduc, Alberta, approximately fourteen kilometres south of Edmonton. The 30,000 square foot facility is situated on ten acres of land, and was built in 1984 at a cost of $8.5 million. The Centre has fourteen full time employees.

The Centre's mandate is to increase the capabilities of Alberta food processors through market driven technology transfer. This transfer takes place through the application of appropriate technology towards the development of new products and processes.

The Centre encourages the development of competitive, technologically efficient products for domestic, national and international markets. These efforts are in accordance with the Science Council's "teamwork" strategy to encourage advanced food processing and product research and development.

DESCRIPTION OF RESEARCH

The Centre is organized into three distinct sections: product development; process development; and special projects.

Product Development

The Centre provides product development services including the assessment of food ingredients, new product formulation, and improvement of existing food formulations. The product development laboratory offers complete analytical services including physical, chemical, and microbiological measurements. This section contains a test kitchen suitable for consumer or institutional food preparation. Associated with the test kitchen is a sensory evaluation laboratory which conducts taste panels which include colour and texture measurement.

The product development section specializes in packaging technology development and assessment, especially in the area of modified atmosphere packaging (MAP).

As an integrated service, the product development section will assist in initial product assessment, prototype development, and pilot plant scale-up.

Printed in Canada 08/94

Process Development
The Centre's process development section offers complete pilot plant services. The equipment provides operations such as heat transfer (retorts, heat exchangers); size reduction (grinding, custom blending); and concentration (vacuum evaporation, ultra filtration). The pilot plant facility contains packaging equipment (both rigid and flexible) and a modern, continuous commercial size batter, breading, frying, and freezing line.

The Centre's meat processing area includes whole muscle meat processing (hams, picnics, etc.), as well as comminuted processing (raw, cooked, or smoked sausage products), and operates under federal meat inspection regulations.

Special Projects
The special projects section of the Centre provides technical information services which aid the resolution of regulatory requirements for formulation, processing, labelling, and packaging. In addition, the special projects section spurs innovation in the food processing industry. New product and processing ideas, gleaned from many areas, are assessed, developed, and promoted at the Centre.

Applied technology and services available to industry, federal and provincial government agencies, ingredient and equipment suppliers and universities include:

- Food Product Development Programme Units;
  - Product Development
  - Packaging Technologies
  - Dairy Products and Processing
  - Sensory Evaluation and Analysis
  - Product and Nutritional Labelling Assistance

- Food Process Development Programme Units
  - Process Development
  - Meat Processing
  - Extrusion Technology
  - Engineering Services

- Integrated Services
  - Quality Control, Quality Assurance, and HACCP Programmes
  - Special Projects
  - Information Services and Technology Transfer.

FPDC's particular expertise and project emphases include product development, process technology applications, and competitive market innovations. Since the inception of the Centre in 1984, product and process development highlights include:

- intermediate moisture products for the export market;
- speciality condiments and sauces;
- jams, jellies, and flavoured honey products;
- high fibre and speciality bakery products;
- dry mixed cereal and bakery products;
- flavoured dairy products, dairy beverages, and culture products;
- nutritionally adjusted meat products;
- confectionery products; and
- modified atmosphere packaging technology application for extended shelf life of meat, produce, bakery, pasta and prepared sandwiches.

Specialized facilities and services available to clients consist of:
- a complete forming, battering, breading, frying, and freezing line;
- an integrated laboratory product development and testing facility;
- a twin screw extrusion capability;
- a modified atmosphere chamber and rollstock packaging equipment for demonstration and application;
- a rotary and stationary retort for hermetically sealed low acid products;
- an extensive test kitchen facility to simulate consumer food service and institutional food preparation;
- a laboratory and pilot plant membrane separation capability;
- a sensory evaluation facility, trained and consumer panel presentations;
- process instrumentation and control assistance to industry;
- an in-plant consultation and trouble-shooting service; and
- restructured meat products development.

INDUSTRIAL INVOLVEMENT

The Centre is available to food processing entrepreneurs, industrial development groups, institutional researchers, and government personnel.

Costs to Alberta based organizations are minimal. Materials and supplies are paid by the client. Limited contract production is available, with fees varying according to the extent and complexity of the project.

RESEARCH GROUP PROFILE

The FPDC has more than a dozen scientists and technicians working in Food Processing Engineering and Development, and in Food Product Development.

RESEARCH CAPABILITIES

FOOD RESEARCH UNIVERSITY OF GUELPH

Food Science Department
Guelph, Ontario
CANADA N1G 2W1

Brian Cox, Ph.D.
Director, Collaborative Research and Development

Telephone: (519) 824-4120
Facsimile: (519) 821-5236

NATURE OF RESEARCH

Food research at the University of Guelph is an industry/university/government partnership. It integrates the development of advanced food technologies with nutrition research aimed at human health promotion and disease prevention, studies of consumer behaviour, international business competitiveness, and public policy. The objective is to create an interdisciplinary research culture, to achieve research leadership and serve the social and economic needs of Canada. A core group of food technologists and engineers in the Food Science Department collaborate with researchers from many of the departments and disciplines across campus and from other universities and research institutions. Industry has endowed four research chairs in dairy chemistry and material science, dairy microbiology, food preservation and packaging, and ingredients for egg based products.

DESCRIPTION OF RESEARCH

Food Material Science

There is a strong group of food material scientists centred in the Food Science Department. Members of the departments of biophysics, chemistry, and engineering are also active participants in food research. The objective is to describe the functional and sensory properties of food in chemical and physical terms upon which predictive models of component ingredients' behaviour can be developed. Current programs cover advanced approaches to sensory evaluation using physical and chemical measurements of material composition and properties; microstructural and rheological studies of food materials; thermodynamic approaches to understanding molecular behaviour and interactions in complex mixtures; and extraction and analyses of flavour components.

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Food Engineering and Advanced Process Control
The objective is to develop sensors for online real time process control strategies which make possible flexible, automated, quality controlled manufacturing processes, and to link models for component and ingredient behaviour with process and equipment design. Current research focuses on optoelectronic methods capable of monitoring a wide range of material compositions and conditions indicative of quality; process control strategies and systems which incorporate both direct measurements of process parameters (where these are measurable), and expert systems that use "fuzzy sets" to describe the subjective and complex information most often encountered in food processing, and fuzzy logic in rule based control algorithms; and on system modelling and unit operation based on predictive modelling of the properties of food materials.

Food Safety
The objectives are to develop improved and rapid methods for predicting and monitoring microbial and chemical contamination of food to identify the appropriate points of inspection and control in the food chain, and to develop a balanced assessment of the real risks to human health. Research currently focuses on the development of online monitoring systems for the detection of pathogens using LUX gene technology, PCR techniques and flow cytometry, epidemiological studies of potentially hazardous microbial contaminants of foods and food material, real systems studies of the hazards of chemical contaminants, and selection and construction of strains and micro-organisms which can be used to inoculate food materials to limit the growth of potentially hazardous or spoilage-causing organisms.

Food packaging and preservation
The objectives are to develop accurate models for predicting shelf life; to eliminate chemical preservatives and exploit natural processes to maintain freshness and nutritional value; and to develop packaging technologies which enhance natural preservation methods. Current research focuses on: aseptic and modified atmosphere packaging, and shelf life modelling. When the Weston Chair in packaging and preservation technology becomes functional in early 1993, there will be a strong and diverse program in thermal processing and packaging technology.

RESEARCH GROUP PROFILE

There is a core group of twenty full time faculty food technologists and engineers in the Food Science Department. There are also approximately 130 researchers conducting food related research in nutrition, business, and consumer studies.

INDUSTRIAL INVOLVEMENT

Research contracts and collaborative programs with Canadian corporations, industry associations, and international companies are an integral feature of food research at Guelph.

The Food Science Department has traditionally made available its facilities for industry use. To better service the needs of industry, an Advanced Food Technology Centre, housed in a new physical facility, is in the final stages of development. This will provide extensive pilot facilities, and one stop shopping for development of research contracts and programs and project management. The new facility will be completed and functional in early 1993.

UNIVERSITY/INSTITUTE INVOLVEMENT

Cornell University
Catholic University, Chile
Centre for Food and Animal Research, Agriculture Canada, Ottawa
Durham College
ENSIA, France
The Food Network
George Morris Centre
Laval University
Macdonald College, McGill University
Palm Oil Research Institute, Malaysia
Ontario Ministry of Agriculture and Food
NRC-IRAP Technology Advisors
Ridgetown College
St. Hyacinthe, Agriculture Canada, Quebec
Technical University of Nova Scotia
The University of Toronto
The University of Waterloo
The University of British Columbia
The University of Alberta
Wageningen, Netherlands

RESEARCH CAPABILITIES

LACOMBE RESEARCH STATION (LRS)

Bag Service 5000
58th Street and the C&E Trail
Lacombe, Alberta
CANADA T0C 1S0

Dr. J.F.C.A Pantekoek
Director

Telephone: (403) 782-3316
Facsimile: (403) 782-6120

NATURE OF RESEARCH

The Lacombe Research Station is situated half way between Calgary and Edmonton on Highway 2. An 879 hectare farm largely supports the production of beef cattle and swine for the Meat Research Centre. The Centre has a holding facility, a kill floor and cutting room, laboratories, a retail display case room, a taste panel area, and a support kitchen. The LRS is administered by the Research Branch of Agriculture Canada.

DESCRIPTION OF RESEARCH

Meat Research Centre

The Meat Research Centre emphasizes research in red meat quality. A portion of that activity involves identifying practical methods of extending the storage life of red meats. The Centre's staff works closely with industry to improve the profitability of the red meat business. Ten scientists are involved in an integrated red meats program that examines meat quality from the pre-slaughter to retail stages of the product.

Processing Hygiene

The safety and storage life of raw meat is greatly affected by the numbers of bacteria that contaminate the product when it is being prepared. Microbial contamination during processing must therefore be minimized. Studies are undertaken in commercial facilities to identify the major sources of the microbial contaminants. Operational procedures and novel processing techniques are developed to assure minimal microbial contamination of the product.

Temperature Control

The safety and storage life of raw meat is highly dependent on the temperatures that the product experiences. Techniques for collecting and analysing product temperature data are developed to permit temperature optimization management under commercial circumstances.

Packaging

Means of exploiting the preservative effects of oxygen free controlled atmospheres (CAPTECH type systems) are examined. Current activities are centred on the development of master package systems for display ready packs of red meat.

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Consumer Acceptance

The research station uses both subjective and objective techniques to evaluate the effects of processing procedures, packaging systems and storage on the taste, texture, colour, and odour of red meats.

INDUSTRIAL INVOLVEMENT

The meat research scientists at the LRS work closely with the meat packaging industry. Both beef and pork processors are looking to expand their markets in North America and in the Pacific Rim. Technologies which extend product life are critical to these future markets. In 1990/91 the LRS received over $400,000 in outside grants from industry and other levels of government to conduct meat related research.

There is active collaboration among the LRS, the University of Alberta, the University of Saskatchewan, the Manitoba Research Council, and Alberta Agriculture. In particular, the station works closely with Alberta Agriculture's Food Processing and Development Centre at Leduc.

RESEARCH GROUP PROFILE

There are ten scientists that work in the Meat Research Centre. In addition to research in meat hygiene, packaging and consumer acceptance, staff members have expertise in red meat production, pre-slaughter handling (particularly stress), carcass grading and food engineering. The scientists are supported by 25 technicians, meat processors and herdpersons.

RESEARCH CAPABILITIES

NATIONAL AGRI-FOOD TECHNOLOGY CENTRE (NAFTC)

An Operation of The Economic and Innovation Technology Council (EITC)

810 Phillips Street
P.O. Box 1240
Portage la Prairie, Manitoba
CANADA R1N 3J9

T. Smyrl, Ph.D.
Manager, Food Technology Department

Telephone: (204) 239-3150
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NATURE OF RESEARCH

The National Agri-Food Technology Centre assists the Canadian food, feed and beverage industry in the areas of:

- food product development,
- food engineering and process development,
- custom processing and packaging,
- food evaluation and testing,
- nutrition testing,
- food information and advisory services, and
- agri-food biotechnology.

NAFTC offers small and medium sized firms a cost efficient opportunity to utilize technical and informational resources to take a food product from conception to market. Large firms use NAFTC to complement in house capabilities.

All client information and discussions are held in strict confidence. Security procedures within the Centre are designed to protect client identity and project activities. NAFTC works with clients on a contract basis where project goals, time lines, costs, and any special conditions are clearly outlined prior to initiation of project work.

DESCRIPTION OF RESEARCH

Food Engineering and Pilot Plant Processing

NAFTC's food engineering staff work closely with clients and other development specialists to develop cost effective, efficient production processes in the NAFTC pilot plant or on site at established processing operations. Feasibility studies, process troubleshooting as well as process design and evaluation of equipment are services offered. Facility and equipment in the pilot plant are suitable for both process development and production and packaging of meat, bakery, fruit, vegetable, cereal, and beverage products. The plant also has capabilities in operations such as cryogenic freezing, pasteurizing, dehydration, MAP, membrane separation, battering and breading, and blanching and cooking. The pilot plant is especially well suited to test market production for a wide variety of commodities.

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Food Product Development

NAFTC staff have significant experience in delivering a comprehensive service to develop new food products for the retail or institutional markets, and to improve existing products to keep pace with the quickly changing marketplace. In addition to product development activities, Product Development staff investigate new uses for industrial by-products, source ingredients, packaging and equipment information. The Product Development unit performs tests relating to consumer preference and product shelf life, as well as providing assistance to the agri-food sector in the compliance to labelling, packaging, and advertising legislation.

Food and Analytical Chemistry

The Food and Analytical Chemistry Department services the agri-food sector by providing pesticide residue testing, nutrient analyses for nutritional labelling, alcoholic beverage testing, general food analyses such as shelf-life studies, as well as custom chemical testing services. Routine analyses are documented through SOP's (Standard Operating Procedures) written from relevant method manuals of such groups as AOAC, US FDA, Agriculture Canada, Health and Welfare Canada, US EPA and NIOSH. Laboratories hold certification with Agriculture Canada for specific testing procedures. The chemistry laboratories are well equipped to analyse a wide variety of food components/contaminants at the parts per billion level.

Microbiology

The microbiology program focuses on the evaluation of both spoilage and pathogenic microorganisms in all food systems. NAFTC microbiologists work closely with the agri-food sector in a quality control role, especially in pathogen analyses and in-plant sanitation programs. Laboratory testing procedures for *LISTERIA* in meat and meat products, and *SALMONELLA*, SPC, and coliforms in egg products have been accredited by Agriculture Canada. The microbiology laboratory is also well positioned to conduct and monitor lab-scale fermentation studies. In addition to the analytical capability to enumerate and identify food microorganisms, the microbiology department has the capability to monitor factors which influence microbial characteristics, for example water activity and microbiological air quality

Information Services

In addition to providing critical support for NAFTC staff, Information Services assists clients to identify technical and market-related informational requirements. NAFTC clients have access to a wide variety of informational sources including books, scientific journals, trade magazines, government and university research reports, and computerized databases. The collection of publications includes current and retrospective information in the areas of food science and technology, engineering, regulations, and the environment.

UNIVERSITY/INDUSTRIAL INVOLVEMENT

The Economic Innovation and Technology Council (EITC)/University of Manitoba Agri-Food Biotechnology Program is a cooperative venture between the Faculty of Agricultural and Food Science, University of Manitoba and the EITC. The Agri-Food Biotechnology laboratories are located in the Food Science Department, University of Manitoba Campus. NAFTC staff in the program are active in a variety of research areas involving the development of monoclonal antibodies to food components (for example, selected proteins), food toxins, and contaminants and selected pathogenic organisms.

The National Agri-Food Technology Centre welcomes collaborative work with all parties from the private and public sectors. NAFTC has formal working agreements with other food research centres in Canada and abroad. In addition, EITC is collaborating, through staff placement, with the Faculty of Engineering and Agricultural Food Science at the University of Manitoba.

The National Agri-Food Technology Centre has been very involved with both private and public sector organizations in investigating the application of modified atmosphere packaging (MAP) to extend the fresh shelf life of a wide variety of food products. Working closely with the food production sector, packaging film, and gas suppliers, NAFTC scientists have worked with a variety of commodities including fruits, vegetables, poultry, beef, and seafood products.

RESEARCH CAPABILITIES

PEI FOOD TECHNOLOGY CENTRE

P.O. Box 2000
Charlottetown, Prince Edward Island
CANADA C1A 7N8

Dr. Richard F. Ablett
Executive Director
Dr. Jim Smith
Deputy Director

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NATURE OF RESEARCH

The Prince Edward Island Food Technology Centre (FTC) was established in 1987 to provide technical services to the food industry. FTC's mandate is to elevate secondary processing and value added activities within the agricultural and fisheries sectors through provision of technical services. In addition, FTC provides research and development leadership, supporting innovation and integration of products, processes, and technologies which enhance the competitiveness and capacity of Prince Edward Island's agricultural and fisheries sectors. FTC's professional team has now grown to thirty-five food scientists, technicians and administrative staff.

DESCRIPTION OF RESEARCH

The Centre is actively involved in fundamental and applied research activities, primarily on the behalf of regional food manufacturers and processors. Facilities include a federally inspected pilot plant which is available to clients for process development, small to medium scale production runs, and test market manufacturing. Chemistry, microbiology, and instrumentation laboratories provide all usual methods of food analysis. Activities include product formulation, ingredient sourcing and testing, shelf life studies, packaging, nutritional labelling and sensory analysis. The Centre is active in areas of pesticide and microbiological monitoring, activities include in-plant monitoring, quality audits, and food product screening.

Pilot Plant
The 2,000 square foot pilot plant is federally inspected for marine and agri-food processing. This allows the Centre and its clients to manufacture small to medium sized test batches, to fine tune processing and to evaluate new equipment or products for test markets. Among the extensive equipment available is a Modified Atmosphere Packaging (MAP) unit used to extend the shelf life of small fruits and vegetables, ABCO and Portaflex blanchers used for killing *LISTERIA* in Lobster, Hobart slicers, peelers and fryers, and a Rhean Extruder used in pilot-scale food processing.

Food Science Laboratories
Product formulations, ingredient sourcing and testing, shelf life studies, packaging, nutritional labelling and sensory analysis are among FTC's wide range of analytical services.

FTC's laboratories, occupying 2,400 square feet, provide an extensive range of analytical capability. An instrumentation section provides analysis of texture, colour, and thermal properties, and includes advanced chromatography such as HPLC (High Performance Liquid Chromatography) and GC/MS (Gas Chromatography with Mass Selective Detector).

The food chemistry lab is involved in analysis of food products for protein, fat, carbohydrate, moisture, ash, fibre, and micronutrients such as vitamins and minerals.

A microbiology lab offers a broad range of food microbial analyses, including tests for *LISTERIA MONOCYTOGENES* and *YERSINIA*. The laboratory also performs microbiological research and development. FTC's well equipped Product Development Laboratory develops concepts and formulations for new products, establishes methods of formal evaluation of those products and conducts sensory analysis trials.

LISTERIA Accreditation
Fisheries and Oceans has examined the FTC laboratory, systems, and samples, and it now recognizes FTC's *LISTERIA* analysis. Extensive efforts are now underway to acquire Agriculture Canada accreditation.

Sensory Analysis
Formal sensory analysis is conducted at FTC to quantify differences in the properties of foods which cannot be measured by instruments. Through the use of an advanced sensory analysis software system, trained sensory personnel evaluate food in terms of taste, texture, colour, and odour, thereby assuring that products provide the sensory characteristics required to meet consumer expectations.

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Food Safety and Quality Assurance

Food safety issues continue to pose the greatest threat to the agri-fish sector. In 1990, a Food Safety Quality Assurance (FSQA) program was launched to study pesticides for the potato industry, and microbial issues for the lobster processing industry. The program also establishes and provides routing quality control support services. Over a six month period, the Centre recruited microbiology, analytical chemistry, seafood processing and management staff. In 1991, a major comprehensive pesticide survey was conducted on behalf of the Potato Producers Association. This data will be kept in strict confidence, but the resulting database will provide the potato industry with accurate technical data. Processes to eliminate *LISTERIA MONOCYTOGENES* have been established for PEI lobster processors. Appropriate thermal processing and equipment retrofits are underway in cooperation with the PEI Seafood Processors Association.

Companies are assisted on an on going basis in identifying risks and developing an appropriate risk management system through Hazard Analysis and Critical Control Point (HACCP) Inspection. Seminars are presented to managers and line employees on sanitation, and lab and food microbiology. Extension services are offered for microbiological and chemical analysis, thermal processing audits, retort verification, and residue testing.

Technology Transfer

Technology transfer is another significant aspect of FTC's work. The Island's limited financial and human resources dictate that, rather than build an extensive research and development capability, it concentrates on the transfer of technology. The Centre has world-wide contacts in food science and technology. Through this network, it has access to technology appropriate to its clients. FTC can select the technology needed, and after assessing and determining the "appropriateness of fit", can work to retrofit the technology for a client.

Current examples include work on Modified Atmosphere Packaging (MAP) technology for small fruits and vegetables, commercial scale production of ready prepared mariniere sauce for frozen cultured mussels, installation of a soya bean roaster for local producers, and the adoption of innovative packaging technologies for Island potatoes.

Research & Development

Most projects carried out by FTC are in response to the needs of industrial clients who approach FTC for solutions to their problems or to pursue new opportunities. However, FTC is also involved in in-house research to develop new products or identify industry solutions.

The conversion of waste products into useful products is of particular importance to FTC researchers. The recent growth in the PEI potato processing industry has sparked interest in potato waste research and efforts are also being made to use fish waste in animal feed.

INDUSTRIAL INVOLVEMENT

Professional food scientists are available for consultation on all aspects of food processing and development. They are actively involved in fundamental and applied research activities, primarily on behalf of Island food manufacturers and processors.

The cost of projects is absorbed by FTC in the early stages, but once the potential of the project has been demonstrated, external funding is sought. FTC staff assist clients in obtaining funding through granting organizations such as the National Research Council and ACOA to assist in funding their projects. An NRC Industrial Technology Advisor is on staff at FTC to assist clients in obtaining the necessary funding.

UNIVERSITY/INSTITUTE INVOLVEMENT

Through the Atlantic Food Research & Development Association (AFRADA), FTC maintains ties with other food research organizations within the Atlantic region.

- Technical University of Nova Scotia
- Nova Scotia Research Foundation
- Memorial University
- Marine Institute of Newfoundland
- New Brunswick Research & Productivity Centre
- Université de Moncton
- Nova Scotia Agricultural College

FTC has also conducted joint projects with the Atlantic Veterinary College (University of Prince Edward Island). A good example of a cooperative effort between the two groups is a successfully completed project on the removal of Domoic Acid from contaminated mussels.

RESEARCH CAPABILITIES

KENTVILLE RESEARCH STATION

Agriculture Canada Research Station
Kentville, Nova Scotia
CANADA B4N 1J5

Dr. Wade Johnson

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Facsimile: (902) 679-2311

NATURE OF RESEARCH

The Kentville Research Station of Agriculture Canada carries out a comprehensive research program on horticultural crop breeding, production, protection, and a poultry study project. In addition, the station has a well established program of research on the postharvest handling, storage, processing, and packaging of food products.

The Kentville Research Station is administered by the Federal Department of Agriculture, Research Branch. The Station also houses inspection staff from the Food Production and Inspection Branch of Agriculture Canada, as well as staff of the Provincial Department of Agriculture and Marketing.

DESCRIPTION OF RESEARCH

The Kentville Research Station Food Research Program consists of a program of basic and applied research, plus collaborative research with industry which is aimed at improving the efficiency and competitiveness of the sector.

Pilot Plant Processing and Packaging

The research unit features a well equipped pilot plant. The capabilities of this plant include: pasteurization; homogenization; aseptic processing; spray drying; freeze drying; reverse osmosis/ultrafiltration; freezing; conventional canning; flexible retortable pouch processing in steam/air mixtures; thin profile retortable plastic trays; and modified atmosphere packaging in lidded trays and bags. The plant's research focus is on modified atmosphere packaging (MAP) of fresh and minimally processed products of horticultural crops. Close ties are maintained with the thermal processing group at the Technical University of Nova Scotia; some of their equipment is located in the pilot plant facility.

Food Engineering

Food Engineering focuses on the development of unit processes and their application to commercial processing systems. Studies of temperature abuse in the fresh/processed food distribution system, and the development of mensuration equipment to determine packaging film characteristics are also undertaken.

Sensory Evaluation

The evaluation program involves an intensive examination of sensory and physicochemical properties as they are influenced by cultivar management systems, preprocessing treatments, processing and packaging systems, and storage.

Food Chemistry

A well equipped Food Chemistry laboratory researches the effects of various production, storage, handling, processing, and packaging practices on the quality of horticultural crops.

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Food Microbiology
The microbiology research program focuses on aspects of microbial growth in chilled and minimally processed food systems; the research program emphasises the safety and spoilage aspects of fresh and processed horticultural crops.

Crop Storage
The storage research program examines methods of maintaining quality, reducing postharvest losses, and extending storage and shelf life for pome and berry fruits and vegetables. The effects of maturity, production method, cultivar, handling, sorting, storage, and packaging technologies are also evaluated.

INDUSTRIAL INVOLVEMENT

Agriculture Canada actively encourages collaborative research efforts with industry. Over one million dollars of collaborative research funded in this way is currently underway.

UNIVERSITY/INSTITUTE INVOLVEMENT

Close ties are maintained with other Food Research organizations within the region.

- Technical University of Nova Scotia
- Acadia University, NS
- Food Technology Centre, PEI
- Research & Productivity Centre, NB
- Université de Moncton, NB
- Nova Scotia Agricultural College
- Nova Scotia Research Foundation
- Memorial University, NF
- Marine Institute, NF

RESEARCH CAPABILITIES

BRITISH COLUMBIA FOOD AND TECHNOLOGY CENTRE (BCFTC)

3650 Wesbrook Mall
Vancouver, British Columbia
CANADA V6S 2L2

Irwin Woodrow
Coordinator

Telephone: (604) 224-4331
Facsimile: (604) 224-0540

NATURE OF RESEARCH

The BCFTC combines the technical capabilities of the British Columbia Research Corporation (BCR), the Department of Food Science, University of British Columbia (UBC) and the Food Technology Program, British Columbia Institute of Technology (BCIT), to provide a uniquely comprehensive R&D resource for the Food, Beverage and Fish Processing Industries within and outside British Columbia.

BCR is a private corporation which carries out research projects for industry and government.

All research conducted by BCFTC is applied and tailored specifically to the needs of the client. Areas of research include product development, process development, waste management and quality assurance.

The Centre's staff includes professionals in fisheries and food technology, analytical chemistry, microbiology, operations management, process engineering and waste management.

DESCRIPTION OF RESEARCH

Nutritional Studies

A major study on the differences in nutritional values of various veal cuts and the effect of different cooking methods was undertaken. Nutritional analyses have also been conducted on a wide variety of food products including soya milk products, breads, and tomatoes.

Shelf Life Studies

Information is required as to a food product's stability during and after packaging. Shelf life studies, utilizing microbiological and sensory evaluation, determine product performance and serve as a basis for recommendations for improvement. Studies have been done with oxygen scavengers in the packaging of bakery products, nitrogen purged packaging for cereals, heat treated sauces and pates that have been cooked by different methods.

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Product Development
Companies engage the BCFTC to develop new products, primarily for line extension and import replacement. Products developed with the help of BCFTC include a high fibre waffle (which allowed the company to obtain a major copacking customer); an instant fudge mix (as an import replacement); soft cookies, tofu dressings, a juice beverage, and organic jams (for product line extension).

Quality Assurance
Because of the global economy, Quality Assurance procedures must be documented and follow international standards in order to ensure that products are safe. The Quality Assurance Manuals prepared for clients in the bottled water, fruits and vegetables, and processed meats businesses, follow the International Standardization Organization 9000 series and include hazard analysis and critical control points (HACCP). Seminars have been given to firms which are interested in HACCP, and in 1991, a two day seminar was presented to the Food Industry.

Specialized Laboratories
These consist of temperature controlled rooms, analytical laboratories, bioassay facilities, a microbiological laboratory, sensory evaluation facilities and a test kitchen.

Specialized Instrumentation
The laboratories have specialized equipment such as a gas chromatograph/mass spectrometer, a thermal desorption unit, a freshness meter, an atomic absorption unit, a flame emission spectrophotomer, liquid chromatographs, instron, colour instrumentation, and a water activity meter.

Pilot Plant Processing
These facilities are located at UBC and BCIT with capabilities for pasteurizing, homogenizing, canning, retorting, comminuting, concentrating, ice cream making, fermenting, packaging, gas mixing and spray, roller and freeze drying, .

UNIVERSITY/INDUSTRIAL INVOLVEMENT

British Columbia Research Corporation (BCR)
University of British Columbia (UBC)
British Columbia Institute of Technology (BCIT)

RESEARCH CAPABILITIES

FOOD RESEARCH AND DEVELOPMENT CENTRE

3600 Casavant Boulevard West
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Dr. Claude B. Aubé
Director
Dr. Gilles Doyon
Section Head, Food Preservation Technologies
Mr. Steve Bittner
Section Head, Communications and Technology Transfer

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NATURE OF RESEARCH

Since its founding in June 1987, the St. Hyacinthe Food Research and Development Centre has become one of the most prestigious food research and development facilities in the country, and its reputation now extends beyond Canada's frontiers.

Recognizing the needs of the Canadian food sector, the Centre's mandate involves two main objectives. The first is to engage in basic research. By studying food systems and developing new technologies, the Centre is gaining the knowledge necessary for the growth of the food processing sector. The second objective is to assist Canadian food industries in undertaking research and development activities.

The St. Hyacinthe Food Research and Development Centre is especially well known for its unique industrial program, which allows industries to perform research and development projects on their own or in collaboration with the Centre's technical and scientific staff. Through its Planning and Industry Services Section, the Centre encourages the execution of industrial projects, and establishes relations with the food and beverage manufacturing sector in Canada and abroad. Technology transfer and communications are also among the Centre's priorities. The Centre promotes technology transfer through patent applications, and the protection of intellectual property and technologies developed at the Centre. It also publishes an industrial liaison bulletin, Alimentech.

The priorities of each research section follow:

- The Bio-ingredients Section: to refine food ingredients production processes and to enhance the quality of fermented foods;
- The Meat Industry Section: to develop new technologies for improving and evaluating meat products and manufacturing processes;
- The Dairy Industry Section: to develop new uses for dairy products and ingredients, while ensuring their safety and nutrient value, and to develop the scientific and technical background to increase the efficiency and profitability of dairy and bakery processing; and
- The Food Preservation Technologies Section: to study basic phenomena involved in the degradation of perishable foods, as well as the mechanisms controlling food stabilization and preservation processes.

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Food Preservation Technologies Section

The main objectives of this research section are:

- To acquire understanding and control of the mechanisms responsible for the degradation of fresh and processed foods; and
- To assure and/or increase the quality and chemical safety of foods by a judicious choice of technologies.

The Food Preservation Technologies Section's priorities are as follows: testing of packaging materials, food-package interactions, postharvest physiology of produce, food quality measurements, processing and preservation technologies, food stabilizers, and heat and mass transfer. The Section is composed of six research scientists, four professionals (polymer chemist, food engineer, microbiologist and food sensory chemist), and five research assistants.

The Section's research priorities are subdivided into eight programs.

1. Research the biochemical and biophysical phenomena involved in the degradation of fresh and processed foods (e.g. artificial and cellular membranes, glycolysis).

2. Characterize the structure of fresh and processed foods (e.g. microscopy and surface properties measurements).

3. Control the degradation of fresh and processed foods by applying an appropriate technology (e.g. irradiation, modified atmosphere packaging (MAP), sterilization, pasteurization, electrotechnologies).

4. Characterize food ingredients (e.g. proteins, polysaccharides).

5. To measure food quality by evaluating physicochemical and sensory properties, and to develop methodology.

6. Characterize natural and synthetic packaging materials.

7. Research food-package interactions (e.g. mass transfer, sensory evaluation and modelling).

8. Utilize modelling and optimization techniques to understand food degradation phenomena and the impact of processing and preservation on food quality.

Industrial Involvement

The Centre's industrial program promotes and encourages the development of an "R&D Culture" within the food industry, with the hope that R&D will become an integral part of any firm's strategic planning in the future.

Over the past five years, more than fifty projects dealing with material (film or rigid containers) testing for gas permeability were confidentially completed by Canadian companies, universities, and foreign companies with partners in Canada. The main purpose of these projects was to measure permeation of oxygen, carbon dioxide, water vapour, and ethylene.

Retail and bulk modified atmosphere packaging (MAP) for medium to long term storage of strawberries, blueberries and raspberries, was also studied with university and industrial collaborators. Computerized model systems are also being developed to assist food industry professionals in packaging development.

A Cobalt-60 irradiation pilot plant is used for material and food commodity testing, and joint R&D projects in our laboratories.

As of June 1992, over 630 industrial projects were registered by some 260 companies in the Centre's pilot plants. Research agreements between the Centre and its clients are defined by the Industrial Services Access Policy. This policy enables the Centre to guarantee that its resources are effectively and judiciously made available to the industry, and that Centre clients are kept well informed of available support aimed at industrial development. The policy defines eligibility criteria, the types of technological and scientific support available, access procedures, and each party's responsibilities. The accent is on well defined research and development activities, consultation, cooperation, partnership, technology transfer and cost sharing.

The St. Hyacinthe Food Research and Development Centre has implemented a fee structure that will be phased in over four years, starting September 1992. This program aims at ensuring, through a proper rate structure, recovery of the costs incurred by the Centre in supporting the industrial program. The recovered funds will be used to maintain and update pilot plant equipment, to acquire new technology, and to allow the Centre to better fulfil its mandate to support the food industry, so as to always offer a state-of-the-art facility to its client.

PARTNERSHIPS SOUGHT

- The Centre is interested in partnerships with research establishments and private firms interested in R&D or strategic involvements in food related projects.

RESEARCH CAPABILITIES

ORTECH INTERNATIONAL

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Mississauga, Ontario
CANADA L5K 1B3

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Manager, Food Science and Technology

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NATURE OF RESEARCH

For more than sixty years, Ortech scientists, engineers, and support staff have worked with the food industry to help meet its technical and business needs. Ortech's unique internal network of multidisciplinary expertise provides up-to-date and cost effective solutions to the project at hand with complete client confidentiality. Projects range from the development and incorporation of new technologies, to problem solving and the development of new ideas.

DESCRIPTION OF RESEARCH

From detailed chemical or physical characterization of process, package or product, to routine nutritional analysis, Ortech's professional teams provide a broad spectrum of services to the food industry.

Ortech has the flexibility to apply its technical skills at any stage in food processing, including the determination of raw material quality, process assessment, and final product evaluation.

Drawing on a comprehensive list of in-house technologies, for instance, Ortech can assist clients in addressing all aspects of the food packaging question.

Industrial design
The industrial design group offers clients a strategic weapon against the competition. The group is involved in all stages of package design and/or modification inclusive of concept design, prototyping, and product development, as well as manufacturing specifications and production.

Materials Selection and Application
Appropriate materials selection is one of the keys to the chemical, physical, and textural stability of a product during storage. Polymer and product specialists, in conjunction with the food team, can assist in these critical decisions.

Package Distribution and Shipment Qualification
By simulating the entire shipping path, Ortech's packaging experts can evaluate container performance at each distribution stage. This often leads to recommendations regarding alternate materials, construction methods, or product protection systems that reduce costs and improve product quality.

INDUSTRIAL INVOLVEMENT

Ortech serves more than 2,000 industrial clients yearly – more than any other independent, not-for-profit industrial research organizations in North America.

While manufacturing dominates, the client base also includes the services, wholesale, retail, and public sectors.

RESEARCH GROUP PROFILE

Ortech's staff of more than 380 includes 114 professionals, of these 30 are Ph.D.s, 118 are technicians, and 120 are support personnel. In addition to revenue generating projects and programs, the staff contributes to the overall advancement of technology by serving on various boards and committees of more than seventy organizations, many of them international in scope.

UNIVERSITY/INSTITUTE INVOLVEMENT

Ortech is a member of APRO, the Association of Provincial Research Organizations and maintains working liaisons with similar organizations in North America and Europe.

In addition, a close working relationship is maintained with universities and community colleges in the area.

RESEARCH CAPABILITIES

SUMMERLAND RESEARCH STATION

Summerland, British Columbia
CANADA V0H 1Z0

T. Beveridge, Ph.D.

Telephone: (604) 494-7711
Facsimile: (604) 494-0755

NATURE OF RESEARCH

Food research at Summerland consists of basic and applied studies in the composition, processing, and storage of horticultural produce. Jointly funded collaborative work transfers world-wide technological developments to the industry, improving its competitiveness and the quality of the products produced.

DESCRIPTION OF RESEARCH

Food Processing Pilot Plant
The food processing pilot plant is equipped to perform process development in wine products and other horticultural produce. Summerland's capabilities include aseptic processing, ultrafiltration and reverse osmosis, conventional press and centrifugal juice extraction, and conventional canning technology. The pilot plant specializes in processing fruit and vegetables, and most innovative and conventional processes can be duplicated on a small scale. Cooperative work with the University of British Columbia on thermal processing of vegetable products and the development of drying technology are on-going projects.

Food Processing
Fruit and vegetable juice extraction, drying technology, and blanching are important projects. The development of practical packages for modified atmosphere packaging (MAP) of lettuces and herbs is an important on-going development. The study of the effects of processing and storage on the flavour of foods accesses the latest expertise in the sensory and analytical sciences.

Food Microbiology
The processes whereby microorganisms attach themselves and cling to surfaces, and their relationship to sanitation and hygiene is an important focus of this program. Work on controlling invasive spoilage of MAP fruit and vegetable material is progressing with the other elements of the MAP program at the station.

Sensory Evaluation
Flavour descriptor profiling of apple cultivars using principal component analysis is the principal work of the sensory evaluation unit. Correlation of these sensory profiles and their chemical composition is an on going, developing program.

Printed in Canada 08/94

Food Chemistry and Analytical Methods

The study of respiration parameters of MAP and the gas permeability of plastic packaging films are part of the MAP program. Other important work centres around mechanisms of formation and measurement of haze development in apple juice. Shelf life studies and non-enzymatic browning of fruit juices and concentrates are another important focus.

Postharvest/Storage

Research in this domain is directed to determining the storage behaviour of new cultivars of apples and pears, and alleviating problems associated with or resulting from storage. The postharvest/storage research program also studies the effects of skin coatings applied to produce, fumigation processes and sweet cherry morphology due to rain splitting on the storage of fruit products. One particular approach to these storage problems currently being researched is the foliar application of calcium salts to alleviate these disorders.

INDUSTRIAL INVOLVEMENT

Over the past two years, the station has actively collaborated with several individual companies on projects ranging from waste disposal to MAP of green vegetables.

UNIVERSITY/INSTITUTE/GOVERNMENT INVOLVEMENT

Ties are maintained with other local, national and international food research organizations.

- University of British Columbia
- B.C. Research
- Alberta Agriculture
- Saskatchewan Research Council
- BC Ministry of Agriculture, Food, and Fisheries
- POS Pilot Plant
- British Columbia Institute of Technology
- British Columbia Trade Development Corporation
- National Agri-Food Technology Center, Manitoba
- Centro de Investigacion y asistencia technica a la industria (Argentina)
- DSIR (New Zealand)
- Swiss Federal Institute of Technology
- Institut National de la Recherche Agronomique (France)
- The National Research Council of Canada, Vancouver
- Oregon State University
- Ontario Ministry of Agriculture and Food
- Research Institute of Pomology and Floriculture (Skiemiewice, Poland)
- Science Council of British Columbia
- Technical University of Nova Scotia
- University of Alberta
- USDA/ARS
- University of Guelph
- Université Laval
- Macdonald College of McGill University
- Institute of Food Research (Reading, England)
- Washington State University

RESEARCH CAPABILITIES

TECHNICAL UNIVERSITY OF NOVA SCOTIA

Food Science and Technology
TUNS, Box 1000
Halifax, Nova Scotia
CANADA B3J 2X4

Dr. Marvin A. Tung
Department Head, Food Science and Technology

Telephone: (902) 420-7758
Facsimile: (902) 420-0219

NATURE OF RESEARCH

The Department of Food Science and Technology in the Faculty of Engineering provides graduate training in fundamental and applied research on food systems and fisheries process engineering. Masters and doctoral degrees are granted which combine graduate level course work and research related to fisheries engineering, marine oils, protein and fish post-mortem biochemistry, food process technology, food rheology and texture, and thermal process science.

The Canadian Institute of Fisheries Technology is affiliated with the Department and provides research and development services on a cost recovery basis to industry and government. The Institute promotes technology transfer and the development of advanced technology aimed at a more effective commercialization of fisheries and food resources.

DESCRIPTION OF RESEARCH

Thermal Processing

The Department has a diverse program of research and development in thermal process science. Areas of research include: understanding the fundamentals of convective heat transfer to food particles suspended in liquids during agitated processes; evaluating commercial retort systems, and developing thermal processes for commercial applications. The studies are carried out in a process engineering pilot plant at the university, and at the Agriculture Canada pilot plant in Kentville, where the university and Agriculture Canada carry out joint research projects.

Rheology and Texture

Applied research deals with fluid flow and viscoelastic properties of foods and food related products and the comparison of textural attributes of food materials in order to quantify the effects of variables such as processing conditions and ingredients. Fundamental studies are aimed at understanding the molecular interactions involved in protein and polysaccharide gel formation and the stability of food emulsions.

Food and Seafood Chemistry

The food and seafood chemistry program conducts research concerning spoilage caused by enzymes and frozen storage. The methodologies used include purification, characterization and kinetic analysis. The mechanism of thermal gelation of proteins in the manufacture of restructured seafood products has been the focus of study in another program. Changes at the molecular level are monitored chemically by electrophoresis, physically by rheological methods, and structurally by light and electron microscopy. Attention has been placed on rapid, accurate analysis of spoilage compounds in seafood Work is also being carried out on chemical detection of seafood toxins, including paralytic shellfish toxin and domoic acid associated with the shellfish industry.

Marine Oils Research

Studies are carried out on the profiling of edible fats and oils; the profiles include: lipid class composition, fatty acid compositions, vitamin content, sterol content, and the presence of polymers or *TRANS* isomers of natural *CIS*-form fatty acids in processed oils. Basic research includes molecular structures of compounds present in edible oils and processed foods. Applied studies have investigated petroleum hydrocarbon tainting of seafood, as well as PCB and pesticide contamination of fish and seafood products. Recent projects include methods to purify edible oils for consumer use and to concentrate desirable fatty acids.

RESEARCH GROUP PROFILE

The Department and Institute currently has five faculty members, 12 research scientists and engineers, and an office staff of four. Approximately than 20 M.Sc and Ph.D. students are employed by the department and institute at any one time.

INDUSTRIAL INVOLVEMENT

Research contracts and collaborative studies are being carried out with companies in Canada and elsewhere. Work is conducted in facilities at TUNS in Halifax as well as on-site in food and seafood processing plants in Canada and other countries.

UNIVERSITY/INSTITUTE INVOLVEMENT

NRC-IRAP Technology Advisors
Fisheries and Oceans Canada
Agriculture Canada, Kentville, Nova Scotia
Acadia University, Wolfville, Nova Scotia
St. Francis Xavier University, Antigonish, Nova Scotia
Marine Institute of Memorial University, St. John's, Newfoundland
Université de Québec à Rimouski, Québec
University of British Columbia, Vancouver, British Columbia
Food Technology Centre, Charlottetown, Prince Edward Island
Nova Scotia Research Foundation, Dartmouth, Nova Scotia
Université de Moncton, Moncton, New Brunswick
Université Sainte-Anne, Pointe-de-l'Église, Nova Scotia

RESEARCH CAPABILITIES

POS PILOT PLANT CORPORATION

118 Veterinary Road
Saskatoon, Saskatchewan
CANADA S7N 2R4

Telephone: (306) 975-7066
Facsimile: (306) 975-3766

Ray Carr, President
Don Hrytzak, Director of Administration and Business Development
Dr. Paul Kolodziejczyk, Senior Scientist

COMPANY HISTORY

The POS Pilot Plant Corporation is a not-for-profit research, development and pilot-scale processing facility serving the food and drug industry. Since opening in 1977, POS has committed its resources to being a "practical world-class R&D facility for Canadian and international industry so that Canadian agriculture can be diversified and the secondary and tertiary industry can be started and developed in Canada."

POS specializes in developing and testing new ideas in the processing proteins, starches, fats and oils. A well-equipped plant and labs allows for a wide range of process, research and analytical possibilities. POS has successfully developed new products and process technology using such materials as canola, soybean, sunflower, peanut, palm, flax, jojoba, mustard, marine oils, pharmaceuticals, essential oils and botanicals.

In 1990, POS incorporated Nuvotech Ventures International to commercialize developments from POS's expanding in-house research program. As a wholly-owned subsidiary of POS, Nuvotech will help facilitate the transfer of technology, as well as provide more opportunities for economic diversification for Saskatchewan and Canada.

Sales:: $1 to $5 million in R&D services annually
Employees: 55 – 65

MAJOR PRODUCTS AND MARKETS

POS's internationally experienced staff and world-class facilities provide a turnkey service including information and patent searches, research, analysis, pilot-plant testing, custom processing, and test-market production. POS provides project coordination services by assembling a package of skills, equipment and management tailored to the specific needs of each client. All projects are handled with complete guaranteed confidentiality. Ownership of research resultsresides fully with the client.

The POS plant is specially designed for the processing and analysis of oilseeds; however, equipment and expertise to work in most areas of food, feed, pharmaceutical, and natural chemical processing are available. POS can process materials from the raw state to a finished product and through our commercial subsidiary, Nuvatech Ventures International, POS can arrange for the marketing and management expertise for any product. POS works with clients from across Canada and throughout the world.

COMPANY TECHNOLOGY

POS's variety of equipment means that virtually any processing system can be custom designed to provide the output required by a client. From beans, nuts or seeds, POS can produce oil and meal products. The oil can be further processed into shortenings, margarines and dressings to precise specifications.

Dry-process cleaning capabilities include vibrating-screen rotating indent-cylinder separators. Rotating disc, impact and air-jet dehullers and classifiers produce seed material of the right quality. Cracking, flaking, or heat conditioning treatment may then be applied depending on the raw material. Extraction of oil from meal can be done on either shallow or deep bed extractor units. For degumming, dewaxing, refining, bleaching, filtration, hydrogenation, interestification, winterization, deodorization, vocation, and a variety of drying options, POS is equipped with the latest technologies. Exacting quality-control procedures are brought into play to monitor all processes.

The expertise of POS staff and wide-range of plant and lab equipment means that POS has a great deal of flexibility in the type of research and development work it can carry out.

AGREEMENTS SOUGHT

POS is looking for partners interested in:

- using its Pilot Plant facility to process/test products forthe Canadian/North American market;
- processing new biotechnology products for registration in Canada;
- marketing of their products in Canada or other countries (through Nuvatech Ventures International);
- using POS's analytical services for testing, analysing and quality control of their products; and
- companies interested in test manufacturing and/or joint ventures in the areas of food, feed and animal and human health care products.