



Department of
AGRICULTURE
FISHERIES &
ORESTRY -
AUSTRALIA



**Innovative
Food
Business**

RECIPES FOR SUCCESS

**CASE STUDIES
ILLUSTRATING
SUCCESSFUL
INNOVATIONS
BY FOOD
BUSINESSES**



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July 2001

Acknowledgments

Recipes for Success was developed by Agriculture, Fisheries and Forestry - Australia (AFFA).

The publication represents the culmination of a joint research project between Howard Partners and AFFA. The project aims to improve the competitiveness of Australia's processed food industry by focussing on the importance of innovation and its management as core business activities.

Howard Partners and AFFA extend their appreciation to the managers and staff in the food companies and organisations involved in the food industry who agreed to have their innovative activity documented in this publication.

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FOREWORD

As the Federal Minister for Agriculture, Fisheries and Forestry I am proud to launch this comprehensive collection of case studies highlighting the importance of innovation to the success of the Australian food industry.

Australia's food and beverage industry boasts a significant contribution to the economic welfare of all Australians. The industry is Australia's largest manufacturing industry, employing a substantial number of workers throughout the country, along an extensive value chain involving the primary production, biotechnology, packaging, transport, marketing, retail and food service industries.

The success of the food industry, in an increasingly competitive and globalised market, will depend on dynamic businesses actively pursuing growth and development over the entire length of the food value chain. Australian food businesses are renowned for their ability to provide quality services and products, to anticipate market developments and customer requirements and to adapt swiftly in a rapidly evolving business environment.

Most members of the food industry acknowledge the benefits and significance of conventional innovation — the novel product or process development, resulting from science, bright ideas and inventions. But business innovation plays an equally significant role in the industry's success and sustainable growth, and I would like to encourage greater recognition of this fact.

Innovative Food Business shows how many novel products and processes evolved and contributed to business success. It also illustrates the importance of innovation as a core business endeavour — a continual activity involving all members of the business, from the inventors to managers and marketers.

The range of case studies presented here is directly relevant to the many food industry businesses, large and small, that are involved in activities along the value chain, on both domestic and global scales. These studies provide messages and ideas for all businesses seeking to increase profits and growth.

I commend this book. I believe it will make a useful contribution to the better understanding of the importance of business innovation and the vast opportunities yet to be explored by the Australian food industry.



The Hon Warren Truss, MP
Minister for Agriculture, Fisheries and Forestry

July 2001

OVERVIEW

John Hamilton-Howard, Director, Howard Partners

The following case studies¹ seek to identify the sources and processes of innovation in the agri-food and food-processing sector. Overall, the case studies point to a number of critical factors in innovation success, including:

- A deep understanding of the market and its customers
- A knowledge of the market environment, including the regulatory framework
- A commitment to a 'customer' in terms of quality, consistency and continuity in supply
- Selection, retention and education of key people
- Access to international markets through joint ventures and strategic alliances with established processors and distributors
- Being able to move quickly on opportunities arising from gaps in the market, changing consumer tastes, preferences and perceptions
- A willingness to take a business risk (entrepreneurship), a passion to succeed, as well as a discipline of managing risk
- Being able to access and embrace the technologies that are appropriate to the business
- A willingness to change from past practices and procedures
- A high level of cooperation and collaboration between small and large organisations, between business units in large companies, and between companies and research organisations
- An ability to do business on a continuing basis with suppliers, research managers, financiers and distributors
- A willingness for hard work and to get involved in the detail, but at the same time hanging on to the big picture.

Defining innovation

Innovation can be interpreted to mean, quite simply, the supply of 'better and more economic goods and services'.² In a practical sense, innovation can be thought of in the following terms:

Innovation may take the form of a lower price — the form with which the economist has been most concerned, for the simple reason that it is the only one that can be handled by his quantitative tools. But it may also be a new and better product (even at a higher price), a new convenience or the creation of a new want. It may be finding new uses for old products . . .

Innovation goes right through all phases of a business. It may be innovation in design, in product, in marketing techniques. It may be innovation in price or service to a customer. It may be innovation in management organisation or management methods.³

Innovation is not just a single action — it is a process that involves the conception of an idea, invention of a new device/product/service and the development of a new market. It relates to the commercial and practical application of ideas and inventions. Invention is the conception of an idea, whereas innovation is the subsequent translation of an invention into the economy.⁴ Thus:

$$\text{Innovation} = \text{Theoretical Conception} + \text{Technical Invention} + \text{Commercial Exploitation}$$

Within this framework —

- Theoretical conception — New ideas, whilst interesting, exciting and often motivating are merely thoughts or collections of thoughts. Ideas may stem from a range of sources, from discovery research to perceived gaps in the market
- Technical invention — The process of converting thoughts into a tangible artefact (a product, service or process). This is where science and technology may play a significant role
- Commercial exploitation — Turning inventions into products that will improve company performance, involving the combined efforts of R&D professionals, management and marketers.⁵

Innovation is the complete process and requires top management attention, involvement and commitment. For businesses to survive in a competitive environment, they must be continually involved in the process of innovation.⁶

The case studies of successful innovation included in this Report reflect all these characteristics.

Sources of innovation

The case studies reveal that innovation is not confined to engineering or research or to manufacturing businesses alone. It extends across an organisation and throughout the value chain. Successful businesses are those that approach innovation on a systematic basis.

Systematic innovation consists of the purposeful and organised search for changes and in systematic analysis of the opportunities such changes might offer for economic or social innovation. It rarely occurs as a result of a single ‘bright idea’.

The case studies indicate that in established businesses successful innovations exploit changes that occur both internally and externally to the business. Major science driven innovations were exceptions and fairly uncommon. However, science is often used to exploit an innovation opportunity through the application of an existing or recently developed technology.

It is also apparent that novel and breakthrough technologies may take many years to achieve a commercial outcome. Substantial investments may be required in product development, market research and promotion. Few research organisations and small businesses have the resources or the skills to undertake these investments.

Smaller businesses were looking to owners of the intellectual property (IP) in a technology to share some of the business risk in its commercialisation in a collaborative arrangement or joint venture. There was also some resistance to the ‘fee for service’ contract research approach of the public research organisations.

The case studies confirm that innovation requires an understanding of an existing, changing or emerging market and a commitment to exploit opportunities. These are essentially business issues and require entrepreneurship, a strong element of management capability and a passion to succeed. This applies in both small and large organisations.

In small businesses these components are vested in one or two individuals, whilst in large organisations innovation is likely to occur through processes of cooperation and collaboration between the marketing, product development, internal and external research capability, operations, and the general management components of a business. This gives rise to important management issues (see below — *Management and Innovation*)

Either way, and as these case studies demonstrate, innovation is associated with commitment and support by business owners and collaborators over an extended period. It is, in effect, a *discipline*.

The discipline of innovation

According to one of the foremost thinkers on innovation, Peter Drucker, innovation (and the knowledge base of entrepreneurship) is a diagnostic discipline: a systematic examination of the areas of change that typically offer entrepreneurial opportunities. In this respect, systematic innovation means monitoring several distinct sources of innovative opportunity⁷:

- Unexpected successes (or failures) that arise from events outside the frame of reference of a business and which create both problems and opportunities
- Incongruities that emerge between business reality as it actually is and reality as it is assumed to be (or as it ought to be)
- A need for change in a process due to considerations of cost, quality or customer satisfaction
- Changes in industry structure and/or market structure
- Changes in demographics — such as age, income and lifestyle that impact on the pattern of demand
- Changes in consumer perception, mood and meaning
- New knowledge — both scientific and non scientific.

Each source requires separate analysis, as each has its own distinctive characteristics. They are, however, listed in descending order of reliability and predictability for innovation outcomes.

For, contrary to most universal belief, new knowledge — and especially new scientific knowledge — is not the most reliable or most predictable source of successful innovations. For all the visibility, glamour, and importance of science-based innovation, it is actually the least reliable and least predictable one. Conversely, the mundane and

*unglamorous analysis of such systems of underlying changes as the unexpected success or the unexpected failure carry fairly low risk and uncertainty. And the innovations arising therefrom have, typically, the shortest lead-time between the start of a venture and its measurable results, whether success or failure.*⁸

These observations are particularly relevant to the food industry. The case studies undertaken in this project identify the broad scope of innovation sources.

Scientific and technical knowledge, acquired through discovery research, has not been a driving factor in many of the case studies. It has, however, been an important enabling factor that has allowed market opportunities and process pressures to be developed and exploited.

It is, nonetheless, important to have a strong science and research base that is capable of generating new knowledge which can be adapted and applied in the development of new products and manufacturing processes.

There should be no expectation, however, that more scientific knowledge and technologies will of themselves result in innovation. Quite often, technologies developed in relation to one possible application will be used in another, quite distinct product.

Management and innovation

The importance of management and organisation to innovation has been recognised for many years. The difference between ‘mechanistic’ and ‘organic’ forms of organisation in sustaining innovation was addressed in the outcome of studies published in 1961 in what has become known as a management classic, *The Management of Innovation*.⁹

Mechanistic, or bureaucratic, forms of organisation are characterised by functional specialisation, a focus on process (means) rather than results (ends), a hierarchic structure of control, authority and communication and a location of ‘legitimate’ and organisationally relevant knowledge at the top of the hierarchical pyramid.

Mechanistic organisations, which are typical in the military, the public service and many large businesses are not seen to be conducive to innovation and change. However, the mechanistic organisation is generally regarded as the ‘most efficient’ form of organisation for getting a job done. The essential management tasks are to ‘command and control’.

Organic forms of organisation, by contrast, are typified by:

- Continual adjustment and redefinition of tasks through interpersonal interaction
- A network structure of control, authority and communication
- Entrepreneurship — looking for, and exploiting, opportunities and where necessary, taking risks
- A culture of cooperation and collaboration reflected in internal teamwork and external alliances
- An overall emphasis on the importance of people working collectively with an overall sense of mission and purpose.

The essential management tasks are to lead, motivate and communicate.

Organic forms of organisation are seen to be appropriate to changing conditions that ‘give rise constantly to fresh problems and unforeseen requirements for action which cannot be broken down or distributed automatically to functional roles defined within a hierarchical structure’.¹⁰

It is important to note that organic forms of organisation can exist in large as well as small businesses. In large organisations, however, the task of managing in an organic framework presents difficult complex challenges for management. A number of large organisations included in the case studies were addressing this issue.

Over the last 15 years economists, accountants and business consultants have advocated management practices that are aimed at increasing efficiency and productivity and rewarding individual performance.

In particular, corporate ‘downsizing’, business process re-engineering, activity based costing and similar practices, have been directed towards reducing costs and increasing efficiency and productivity. Performance based incentives and rewards for senior managers focus efforts on individual rather than team based performance.

Economists, and particularly organisational economists, have promoted a view that the market is the ideal way to organise all economic activities and that organisations are a ‘special case’ to address problems of market failure due largely to limited information and a propensity for people to behave ‘opportunistically’.

The focus on efficiency, productivity, individual performance and contracts subverts the cooperation and collaboration that is essential for innovation, both internally and external to the business. It is in this context that three leading management thinkers recently called for a ‘new management philosophy’¹¹. They argue that:

*In terms of static efficiency, much of what happens in a company is inefficient. That’s the point. It exists precisely to provide a haven and (temporary) respite from the laws of the market in which humans can combine to do something that markets aren’t very good at: innovating.*¹²

They argue for managers to move away from an ethic of value ‘appropriation’ to strategies based on a ‘value creating logic of continuous innovation’. They point to evidence that successful companies have created innovations through a spirit of collaboration among people that markets, and companies that think of themselves as markets, cannot engender¹³. This observation is borne out in a number of the case studies included in this Report.

Innovations should be seen to create value for not only owners, but also for customers and an industry. Globalisation, competition and market dynamics in the processed food sector point to the need to address ‘non-price’ factors as the basis for generating value for both companies and consumers.

Long-term success is associated with a quality product, consistency over time and continuity in supply. The case studies point to the importance of value relationships in both domestic and international markets. These are built around reputation, trust, ‘brands’, personal relationships, and a commitment to continuous innovation.¹⁴

While making something that is technologically brilliant is a good thing to do, at the end of the day, it is the brand that will deliver longevity and ultimately a sizeable export market. Alternatively, companies may develop a strategic alliance to provide key ingredients for a brand that is already established in a market.

For Australian food producers and processors it is vitally important to have a corporate presence in the market that is being developed. It is not possible to rely on agents and third parties that typified the commodity approach to export.

Innovation categories in the food industry¹⁵

Innovation can be segmented into a number of different groups, which have different risks and rewards according to the business focus. These groups also attract differing levels of public sector interest, involvement and support. The case studies have been organised into the following categories:

PRODUCT INNOVATION

Product innovation basically deals with the development of new products, including new plant varieties. The food industry is assisted in science-based research and development by the Rural R&D Corporations, Food Science Australia (FSA), Grain Technology (the old AWB Laboratory), BRI Australia Limited, CSIRO Divisions and State Agriculture Research Institutes and Food Development Laboratories.

Innovation in the food industry is very much ‘business driven’, arising from market opportunities. Several of the case studies indicate that strategies to address gaps and opportunities that arose in a business environment generated new scientific and technical knowledge.

PROCESS INNOVATION

Process innovation deals with cost reduction, efficiency improvement and/or quality enhancement within a plant through new equipment or process applications.

Many of the case studies involved significant process innovation by applying and adapting existing knowledge to opportunities that had emerged in the business environment.

CHAIN AND LOGISTICS INNOVATION

Chain and logistics innovation includes critical areas such as distribution methods and transportation, packing materials and processes, and innovations which examine the supply chain and the relationships which enable non-price factors to be developed.

The significance of cooperation, collaboration and networks

It is clear from the case studies that innovation requires cooperation and collaboration within an organisation as well as with organisations external to it through alliances, partnerships and joint ventures.

On the basis of many years of research, experience and observation, the current Dean of the MIT Sloan School of Management has concluded that:

Innovation is not the consequence of a moment of brilliance. Rather, it is the fruit of an integrative approach — the melding of strategy, marketing, production, R&D and finance. Innovation is the result of a participatory process coupled with a relentless determination to make things happen (planning, control, follow through, prototyping, revision).¹⁶

He supports the argument that real innovation starts with a strategic outlook — the product of many minds and diverse inputs — then proceeds to a consideration of technology, and then to product and service design.

Another recent study has pointed out that a high proportion of all innovation occurs at the interface between innovative suppliers and customers and that ‘companies have found that proper attention to outsourcing interfaces up stream and cooperative arrangements downstream lowers innovation costs and expands the value to customers’.¹⁷ In the beverage sector, outsourcing new product innovations was found to avoid huge investments, time lags and risks.

In the case studies it was generally the companies that identified the problems and the opportunities that led to innovation in both product and process areas. Universities and research organisations became involved in developing solutions on the basis of projects and programs initiated by companies.

A research director of a multi-national corporation has observed that, increasingly:

... there are formally designed interactions of university-based researchers with business people, venture capitalists, patent lawyers, production engineers, as well as research engineers located outside the university. This invariably involved shared use of academic and industrial facilities. Under these conditions, technology is more likely to be trans disciplinary, and to be carried out by people who are able to rise above disciplinary and institutional loyalties.

These and similar changes and transformations are advancing so rapidly that their impact on traditional institutions and attitudes has just begun to be understood.¹⁸

The form of collaboration and interaction between organisations is becoming increasingly important in the context of globalisation, the cost and complexity of research and development, and the importance of supply and distribution channels. Those arrangements are moving from a ‘contract’ to a ‘partnering’ structure and involving Australian and overseas organisations.

Conclusion

There is a tendency to interpret innovation as something that is driven by scientific research and development (R&D). Expenditure on R&D is regarded as a major indicator of innovative effort. This places an emphasis on the generation of new ideas and knowledge through R&D, but it may actually understate the amount of innovation that is taking place in areas such as product development, marketing and distribution.

It became clear from the studies that food companies that are trying to build a brand as opposed to producing unbranded product need assistance with marketing and advertising to be able to compete with the international brands that have very large promotional budgets. It is the brand that will deliver Australia its manufacturing wealth.

In 1996 Specialty Cereals realised the potential for seed products to be used in commercial cereals, to produce new functional foods for the health-conscious market.

SPECIALTY CEREALS

FUNCTIONAL FOODS

Specialty Cereals is an Australian owned manufacturing company, established in 1988, that uses the latest research and technology to produce innovative, top-quality cereals and snacks. Its specialty is developing cereal-based ‘functional foods’ that taste great, are wholesome and nutritious, and appeal to the health-conscious consumer. A functional food is the result of combining beneficial ingredients in a natural format to produce a whole food product. Many companies take purified extracts and add them separately to food products or market them in tablet form. Functional foods focus on the synergistic effect of beneficial ingredients.

Specialty Cereals used innovative techniques to develop new functional foods and build a successful company.

The Opportunity

In 1995 Specialty Cereals installed packaging equipment to service a number of Kellogg’s brands. It seemed logical to further develop Specialty Cereals by establishing its own brands and preparing retail-ready products. Specialty Cereals purchased a licence to market products under the Vogel’s brand. The company continues to pay royalties to Vogel’s for the use of their brand name and also continues to manufacture and package for Kellogg’s.

In 1996 Specialty Cereals realised the potential for seed products to be used in commercial cereals, to produce new functional foods for the health-conscious market. It held discussions with the large cereal companies for marketing support, but although there was some interest, these larger companies did not offer support.

Development of the Opportunity

Following collaboration with Food Science Australia, the CRC for Food and Nutrition and a number of nutrition research organisations, including centres at Monash and Adelaide Universities and the Smart Foods Centre at Wollongong, Specialty Cereals developed formulations for their cereal products.

Specialty Cereals launched the first soy breakfast cereals into the Australian market — Vogel’s Ultra Bran Soy & Linseed and Vogel’s Soy-Tana. The latest addition to its product range is LycoSoy CrispSticks, a functional food based on the combination of lycopene and soy. Scientific research has shown that naturally occurring lycopene can reduce the risk of health disorders such as prostate, breast, skin and gastro-intestinal cancers and cardiovascular problems.

The company maintains a strong interest in research and the commercial opportunities associated with the impact of functional foods in many health areas including neural cognitive function, eye disorders, cancers, cardiovascular diseases and skin protection. By staying abreast of scientific findings, especially in nutrition, Specialty Cereals are able to develop new products accordingly.

Critical Success Factors

The Company is committed to a strategy of developing new customers, as well as nurturing existing ones. Through continuous innovation, they are able to focus on good credible ingredients and producing functional foods that look and taste good, and also provide nutritional benefits.

Impact

Specialty Cereals plan to produce LycoSoy in the US under contract manufacturing arrangements — there are no large-scale contract manufacturing establishments in Australia. The Natural Health Expos in the US and academics in the area of nutrition research consider the products to be some of the best functional foods in the world. Specialty Cereals is also looking at developing new products in the rapidly growing ‘breakfast bar’ market.

The co-operative identified the need to change its structure to a public company and this was completed in December 1989. The result was a more flexible structure with capital-raising opportunities.

BUDERIM GINGER

GINGER PRODUCTS

Buderim Ginger Ltd has earned its place as a world leader in ginger processing and boasts superior knowledge, consistent quality and innovative product lines. Ginger is a unique commodity as it can be processed to deliver a variety of products, from jams, confectionary, sauces and bakery items, to marinades, ice creams, drinks and health treatments. Ancient remedy information and recent research indicate that ginger has significant health benefits.

When the Chinese supply of ginger was interrupted by World War Two, a group of enterprising ginger farmers in the Buderim region formed the Buderim Ginger Co-operative Company Limited, later to become Buderim Ginger. The company acted as the agent for the Queensland Ginger Marketing Board, and processed the region's produce.

The company gradually grew and by 1987 Buderim Ginger had about 150 staff. It was a world-renowned producer of quality ginger, but there was very little innovation in product development, production techniques, or marketing, and it became clear that the business operation relied simply on supplying orders.

Buderim Ginger increased sales of ginger by changing from a commodity-based to a value added product-based company and developed a wider variety of consumer products to appeal to a growing market.

The Opportunity

The co-operative identified the need to change its structure to a public company and this was completed in December 1989. The result was a more flexible structure, with capital-raising opportunities expected to better secure the future of the business and the industry.

As a recognised industry leader, the company championed the creation of a larger market for ginger products. Ginger as an ingredient for end manufacturing (ie raw or powdered ginger) usually loses its identity, however it was realised that Buderim Ginger could be more easily differentiated as a retail product. The potential to increase sales of ginger by increasing the awareness of the versatility of ginger products, across a wide range of food styles, was finally recognised.

Development of the Opportunity

In 1994 the company engaged the Queensland University of Technology (QUT) School of Marketing to assist with the development of a more dynamic marketing strategy.

The decision to enter the retail market through supermarkets was taken during the 1990s. Supermarket profit margins, presentation and delivery are not always attractive and they are limited to stocking fewer products than the Buderim Ginger range. Buderim Ginger decided it would benefit further from operating its own retail outlet in a shopping centre.

The company is currently working with the Centre for Food Technology in Brisbane. Research is being undertaken on a number of different aspects of ginger, including its perceived ability to relieve or treat inflammation, various forms of pain, digestive problems, and to aid in the reduction of cholesterol.

The Centre is aiming to prove these claims and to identify the amount of active ingredient needed to deliver the benefits. Buderim Ginger plan to relate this information back to their existing products or develop products to gain registration to enter the nutraceutical market.

Most recently Buderim Ginger has diversified into the organic market following authorisation by the Biological Farmers of Australia (BFA) to process organic ginger, and official certification, in October 2000, by the Australian Quarantine and Inspection Service. Buderim Ginger has applied to export the organically grown and processed product to the UK, based on BFA certification.

Critical Success Factors

Innovation requires a degree of risk. Buderim managed their risk by bringing the existing management team together in-house. They also recruited an expert consultant to help with business guidance, sourcing suitable brokers, packaging and pricing. The consultant was also critical in outlining the expectations of future developments and providing the confidence to go forward. The final critical factor was the timing.

Impact

In 1994 there was very little branding of ginger and the majority of retail product was only available under customers' brands. The company decided that they should distribute crystallised ginger throughout Australia under their own Buderim brand. As a result, crystallised ginger sales have more than doubled. This was their spearhead product and was primarily successful due to availability and awareness.

The company then developed a range of jams — they reformatted, repriced and re-branded the products and found a food broker who would support the products nationally. Buderim Ginger now produces over 15 different ginger products and can resource packaging, pricing and retailing more effectively.

Buderim Ginger exports about 60% of its products, which is a level they have maintained for many years. They sell to major jam manufacturers in Europe — Holland and Germany are their traditional customers but they also sell to other European countries and North America.

The USA is currently their second largest export market and was identified as offering significant growth potential. Their current market, which they are working to expand, is broadly built on selling to gourmet food companies and re-packers of crystallised ginger.

Buderim Ginger has traditionally used a master distributor in California to service the US market. Now the company is endeavouring to fast track growth by employing a manager and incorporating a subsidiary company in New Jersey. The manager's brief is to get product to major industrial customers. They start with product development, then look forward with market development.

Freedom Foods was essentially developed due to the allergy-related difficulties experienced by one of the founding partners, and her belief that there was an untapped market for people with special dietary requirements.

FREEDOM FOODS

NATURAL DIETARY FOODS

Freedom Foods, a company formed in the 1980s, provides a range of natural foods suitable for consumers with food allergies, intolerances or with other special requirements.

The range of natural dietary foods includes products from which typical 'problem' ingredients such as gluten, dairy, refined sugars, saturated fats, salt, yeast, artificial flavours, colours and preservatives have been eliminated or reduced. The foods then meet the needs of diabetics, coeliacs, candida sufferers, asthmatics, people with high blood cholesterol, those who need to lose weight, athletes and those on a low-salt regime.

Traditionally these products have been expensive and sold only in health foods stores. One of the Freedom Food strategies was to make these products at a cost effective price and distribute them through supermarkets.

The Opportunity

Freedom Foods was essentially developed due to the allergy-related difficulties experienced by one of the founding partners, and her belief that there was an untapped market for people with special dietary requirements.

With further research it became clear that people with food allergies and other intolerances often had to travel extensively to find safe foods and/or ingredients. These consumers were being overlooked by the mainstream retail outlets.

Development of the Opportunity

Market demand for dietary specific foods was quite strong with medical support groups like Diabetes Australia, the Coeliac Society, the Asthma Foundation, and allergy units, all looking for food products. The wholesale business developed quickly, distributing over 2,500 agency lines to health food stores. At this stage the partnership registered a brand and trademark and initiated Freedom Foods.

Working capital was secured by selling agency lines to a competitor in health food distribution. Freedom Foods began to produce its own range of specific dietary products, catering for those with food intolerances and lifestyle needs. Capital expansion occurred by the issue of shares to four new working partners.

Freedom Foods then began to market its own product through supermarkets. This increased consumer awareness of, and access to, healthy alternative foods allowed the products to be retailed at a reasonable price. In addition, the supermarket distribution allowed the company to sell off the traditional business of distributing over 2,500 agency lines to health foods stores. The proceeds of sales enabled the development of the concept and the creation of 50 new Freedom Food lines.

The success of Freedom Foods also allowed it to extend into manufacturing by building its own bakery.

Critical Success Factors

One of the major factors which contributed to the success of Freedom Foods was the absolute belief in and passion for the concept of providing foods for those with allergies and intolerances. There was no compromise on standards as far as this underlying concept was concerned.

It was also critical to understand supermarkets and their financial demand for product support prior to negotiating deals with them. Recognising the gaps in the market place and creating new opportunities demanded hard work and persistence.

Other factors identified includes market intelligence, business strategy, technology strategy, internal technological capability, cooperation with suppliers, understanding the nature and extent of business process problems, general management capability and workforce cooperation.

Impact

Freedom Foods began as a small enterprise, with a two-member partnership. It now has a team of 19 and supplies stores all around Australia and, increasingly, overseas. Sales have also grown significantly, from \$2 million to \$5 million over the past eight years.

CHERIKOFF PTY LTD, THE RARE SPICE COMPANY

NATIVE AUSTRALIAN FOODS

Cherikoff Pty Ltd, formerly Bush Tucker Supply Australia, was started in 1983 by Vic Cherikoff, as a pioneer venture to supplement his native food nutritional research. The company is now a leader in an industry it has virtually created.

Native foods are foods and/or ingredients, once only present in the Australian bush but now cultivated organically. They offer nutritional and functional attributes as well as novel and distinctive flavours for integrating into modern cuisine. In particular, Cherikoff Pty Ltd supplies spices as ingredients for food manufacturers and processors to market products with unique taste characteristics. The regular gourmet range of native foods includes fruits, herbs, spices, seeds, nuts, and distilled food oils, as well as a range of retail products and value-added goods.

The Opportunity

Following a Bachelor of Applied Science specialising in biochemistry, industrial microbiology and environmental science, Vic Cherikoff spent five years researching clinical pharmacology. He then worked for six years analysing the nutritional composition of native foods, particularly foods used by Australian Aborigines. He devoted his research to analysing and promoting native foods and travelled extensively throughout Australia, collecting food material and traditional information. At the same time, he was passing on the relevance of the nutritional data to outback Aboriginal communities and health workers.

Development of the Opportunity

In 1988, the public interest in Cherikoff's work had grown sufficiently to support a successful cottage industry, which provided native foods and relevant application information on a small scale. Cherikoff Pty Ltd recognised the increasing appeal of native Australian food for modern cuisine, both locally and overseas, and also the potential to easily process and add value to the products. By 1990, the market was growing dramatically and the company moved away from the cottage industry focus to mainstream status in the production of native foods. A major breakthrough came when the company entered into an agreement to provide three flavours for the Goodman Fielder range of Bush Breads.

To promote native foods, Cherikoff wrote school and trade curricula to educate qualified and apprentice chefs on the availability and uses of a myriad of native foods and supplied samples of various 'novel' Australian ingredients to chefs. Cherikoff also published several books on native foods and ran regular courses for professionals, presenting the use of native foods to over 450 chefs in the first year of the courses.

Cherikoff Pty Ltd has an ongoing commitment to research and development focussed on the functional properties of native foods and works in joint venture arrangements with the CSIRO and Universities to develop and apply food science technologies. Vic Cherikoff also supervises research students at

To promote native foods, Cherikoff wrote school and trade curricula to educate qualified and apprentice chefs on the availability and uses of a myriad of native foods and supplied samples of various 'novel' Australian ingredients to chefs.

several universities on projects. The universities are involved on a collaborative basis through his involvement in Cooperative Research Centre arrangements.

The company's most recent innovative developments include the adoption of a strategic and incremental approach to introducing ingredients into food manufacture. It is currently positioning its range within the envisaged 'new millennium' spice trade of the industrial ingredient market. This offers a significant competitive edge for food manufacturers seeking product differentiation.

Critical Success Factors

The first thing Vic Cherikoff suggests that innovators have is persistence. They also need to carefully select business partners and ensure tight contracts which ensure confidentiality.

The 'Godsend' sale is one thing but the ability to guarantee supply over an extended period is also required.

Finally, an innovative marketing focus, through public awareness and the internet, is complimented by effective business and general management capabilities.

Impact

It is not only the dedicated Australian style outlets using native foods — Chinese, Italian, Thai and French cuisines are embracing the Australian flavours and matching them with their respective, traditional cooking methods. Cherikoff Pty Ltd now supplies over three dozen native foods — all harvested in a sustainable way — in many different forms, to the global food industry.

Its products are used extensively in breads, biscuits, jams, seasonings, sauces, desserts and beverages and the company is currently growing opportunities in the cosmetics and pharmaceutical markets.

Cherikoff regularly supplies 400 restaurants with native food products, as well as several airlines, railways and cruise ships. Mainstream and boutique bakeries are marketing native flavoured breads and pastries, and major retail spice companies are marketing native seasonings.

Numerous native influenced products are now available nationally in supermarkets, including ready-to-use sauces, syrups and seasonings, as well as value-added products produced by boutique and mainstream manufacturers.

There has been a successful launch of Cherikoff flavours in 330 Sainsbury supermarkets in the UK and an amazing response to the products in the US, where the penetration of food service, manufacturing and retail markets is imminent.

As well, the native ingredients have performed strongly in an anti-arthritis preparation for a US customer, taking this manufacturing client from a new customer to the largest single client in five months.

In addition to its own R&D centre, Bonlac funds research institutions, including Food Science Australia, Melbourne University and state agriculture departments, to conduct research on dairy products or related ingredients and processing techniques.

BONLAC FOODS

RECALDENT™

Bonlac Foods is an Australian company owned by 2300 dairy farmers in Victoria and Tasmania. Since it began in the 1880s, the company has been developing dairy-based ingredients and foods. Bonlac Foods comprises three business divisions — Consumer Products, Ingredients and Bioscience.

Recaldent is the first product of Bonlac Foods' Bioscience division. It is a complex of casein phosphopeptides and amorphous calcium phosphate (CPP-ACP), a bioactive ingredient that has been shown to remineralise, or rebuild, tooth enamel.

The Opportunity

Sugars consumed in the diet are converted into acids by plaque bacteria that occur commonly in the mouth. These acids act on the teeth to dissolve, or 'demineralise', areas of the tooth enamel, which is composed of calcium and phosphate. Over time, these demineralised areas become larger, resulting in tooth decay.

CPP-ACP prevents and actually repairs the early stages of tooth decay. The casein phosphopeptides (CPP) have the ability to maintain calcium phosphate (which is normally highly insoluble) in a soluble, 'amorphous' state. Only in this form is the calcium and phosphate able to diffuse into the tooth enamel and remineralise areas that have been demineralised through the activity of acids. In addition, the CPP readily binds to the surface of the tooth, and to the bacteria in the plaque surrounding the tooth, thus presenting a high concentration of the amorphous calcium phosphate (ACP) in close proximity to the tooth surface.

This inhibits demineralisation and promotes remineralisation. Staff at the University of Melbourne Dental School, where the peptides were first identified and isolated from milk in the 1980s, have extensively researched and patented the CPP-ACP technology. Recaldent™ is the result of close cooperation between the University of Melbourne, Bonlac Foods and the Victorian Dairy Industry Authority (VDIA).

Development of the Opportunity

Bonlac Foods licensed the technology, constructed a commercial manufacturing facility and provided the technology to market Recaldent. The VDIA supported the University's development of the technology and CSIRO's Food Science Australia assisted in the scale-up of the manufacturing process.

Bonlac operates an R&D centre that is based in Dandenong, Victoria. The centre has approximately 12 staff, who are responsible for the development of products and processing techniques. By having its own R&D centre, Bonlac is able to readily update to and modify the latest in high technology, develop its products and provide information for its customers.

In addition to its own R&D centre, Bonlac funds research institutions, including Food Science Australia, Melbourne University and state agriculture departments, to conduct research on dairy products or related ingredients and

processing techniques. By maintaining close alliances with independent research organisations, Bonlac Foods is able to be pro-active in product and processing development, rather than reacting to market trends or customer comments. Through consideration of independent research that it may not have otherwise explored, for example dental care, Bonlac Foods maintains innovative development of its products.

For other projects, Bonlac Foods has received an R&D START Grant from the Commonwealth Government and has also taken advantage of the Dairy Research & Development Corporation matching funds.

The intellectual property in the CPP-ACP rests in three areas — the technology itself, the manufacturing process, and the Recaldent trademark. The University of Melbourne and the Victorian Dairy Industry Authority patented the CPP-ACP complex. Bonlac Foods Limited has exclusive manufacturing and marketing rights for CPP-ACP and is the owner of the trademark.

Critical Success Factors

Critical to the success of Bonlac Foods is the dedication of the company to both its own research and that of independent institutions. The Bioscience division specifically focuses on Research and Development for the company to develop high technology processes and products and to build a sustainable competitive advantage.

They have done this by entering new markets and attracting new customers, patenting technology, and developing a commercial manufacturing process that potentially enables the further development of Intellectual property.

Impact

Bonlac Foods have worked with a number of organisations both here and overseas to develop products containing Recaldent and in early 1999, the US Food and Drug Administration accepted the status of Recaldent as GRAS (Generally Recognised as Safe).

Recaldent was introduced as an ingredient in Warner-Lambert's Trident Advantage™ and Trident for Kids™ sugar-free chewing gums in the USA and Europe in late 1999, and in Japan in early 2000. A sugar-free mint containing Recaldent (Trident Advantage™ Mints) was launched in the USA at the end of 2000. The Recaldent logo is carried on the front of all packaging and the dental care benefits of Recaldent are the primary feature of advertisements for the product.

The addition of Recaldent to other oral care products and the use of the CPP technology in other applications are expected to follow in the coming years and potential customers are already evaluating the product.

GOODMAN FIELDER FRESH

TOP NOSH CONVENIENCE MEALS

Top Nosh is a range of fresh chilled meals launched by Goodman Fielder Fresh during August 1999. Goodman Fielder Fresh (GFF) was established in 1998, as a division of the Goodman Fielder company, to tap into consumer demand for fresh, high quality, convenient meal solutions. The Top Nosh range covers 25 varieties of meals, across Italian, Indian, Asian and modern Australian cuisines, including pasta, pilau rice, chicken korma and Thai curry. Top Nosh contains no preservatives and has a shelf life of nine days.

The fresh chilled meals segment is tiny compared with sales of other chilled meals that contain preservatives and have longer shelf lives. However, the research company, BIS Shrapnel, estimates that the total market for fresh chilled meals could reach \$600 million within five years.

The Opportunity

In Europe chilled meals are big sellers, particularly in Britain where Marks & Spencer introduced the first range of fresh chilled meals more than 15 years ago. European sales of fresh chilled meals exceed \$2 billion a year and are growing between 20–30% annually.

Previous attempts to lure Australians to fresh chilled meals have failed. However, GFF believes it has ‘cracked the code’ with Top Nosh’s quality, which it claims is vastly superior to anything currently available.

Development of the Opportunity

GFF carefully chose supermarkets to stock Top Nosh products based on demographics and ease of supply. It targeted stores similar in characteristics to the successful British fresh chilled meals retailers, restricting initial distribution to Sydney and Canberra. The company tested the products extensively with consumers before the launch, with very encouraging results.

Under the pilot program, 48 Sydney supermarkets stocked Top Nosh by the end of 2000. Getting the products into supermarkets quickly is critical when shelf life is limited to one week. Current wastage levels of 20 percent are expected to fall once retailers are better able to estimate consumption rates.

Recognising the risks involved in launching a new brand, GFF has made only a modest \$3 million investment to ‘tool up’ an existing plant in Sydney. The factory is operated by a dedicated business unit and draws on support services, such as Logistics and Accounting Services, from Goodman Fielder’s Shared Services facility. Goodman Fielder’s logistics network is critical to delivering fresh products efficiently and cost effectively. Marketing support and a year of product development accounted for a further \$7 million investment.

GFF’s capital investment has been primarily directed at importing the latest British equipment needed to produce meals by the ‘cook chill’ process incorporating full segregation of high and low risk food preparation areas. The company claims to be the only food manufacturer in Australia making meals using this technique, which is widely employed in Britain and Europe.

At this stage, Top Nosh’s introduction is a low-key exercise. Full-scale production will only occur if the concept succeeds. GFF considers it will be at least a year before the company sees any return on its investment. The purpose of the first two years is for GFF to gain experience and knowledge

from the smaller-scale production and to enhance its confidence to scale up if appropriate in the future.

Goodman Fielder's full technical resources have assisted the launch and the achievement of 'category best' product quality and food safety standards. These include HACCP programs, microbiological testing and sensory panel testing and analysis. CSIRO has been involved in auditing the local plant and believes the GFF factory is setting new standards in food safety and manufacturing processes. GFF have also developed relations with the UK's Campden and Chorleywood Food Research Association Group, who are internationally renowned for their experience and technological resources in the chilled meals industry.

Critical success factors

Understanding consumer preferences and requirements is considered by GFF to be vital to the development of their product categories. Meticulous attention to Food Safety and Product Quality and a keen awareness throughout the company of Supply Chain mechanics are also critical success factors.

Immediate response to consumer demands or concerns requires a whole-of-company approach to all aspects of research, marketing and manufacture. A collaborative working environment and positive team management, supported by high level company management, are also considered very important aspects of a successful and innovative business.

Impact

The fresh chilled meals segment is tiny compared with sales of other chilled meals that contain preservatives and have longer shelf lives. However, the research company, BIS Shrapnel, estimates that the total market for fresh chilled meals could reach \$600 million within five years.

According to retailers, the new Top Nosh range of meals has been very successful. Coles worked with GFF to develop the range and is the primary retailer of the products. Woolworths aims to increase awareness of the category among consumers, and is increasing its distribution with GFF on progressive and meaningful expansion of the trial. Woolworths sees the shorter-shelf-life quality fresh products as reflecting the consumer's needs.

The Wave project shows that research and development is important for innovation, especially in making sure the product is competitive in all areas. There was investment in the people and pilot trials to determine the product formulation. The investment in plant trials and scale up was also critical.

BONLAC FOODS

WAVE™ PROCESSED MILK

Bonlac, one of the nation's leading dairy groups is fully Australian owned and controlled by 2300 dairy farmers. Bonlac brands include Western Star (Australia's best-selling butter), Bodalla, Allowrie, Perfect Italiano, Bega, Diploma, Spring Valley and Gatorade.

The Opportunity

The flavoured milk market is worth around \$350 million annually. Fresh milk brands such as Moove, Oak, Dare, Breaka, and Big M, compete heavily for this market. Bonlac wanted to open up new markets for long life, fresh tasting, flavoured milk.

Developing the opportunity

In December 1997, Bonlac's Technical Services Division product development team approached the board for approval to develop a flavoured, long-life dairy beverage. The objective was to produce and market a dry goods distribution product that tasted like fresh milk. The product was designed to expand the flavoured milk sector rather than to take market share from existing fresh brands.

The company has invested an enormous amount of intellectual property to get the product's flavour right. Bonlac purchased this intellectual property from universities, the Dairy Research and Development Corporation and Food Science Australia. The technology and equipment needed for long-life dairy products is expensive. Milk must be processed in a sterile environment and packaging must be sterile at the filling point.

Bonlac spent \$33 million on a purpose-built ultra-heat treatment (UHT) facility to take supply from its main milk-processing plant at Cobden in western Victoria. The new equipment was ready for commercial production in March 1999.

The Wave project shows that research and development is important for innovation, especially in making sure the product is competitive in all areas. There was investment in the people and pilot trials to determine the product formulation. The investment in plant trials and scale up was also critical.

Bonlac Foods' launch of Wave in April 1999 was seen as a daring step in a crowded market. Although many UHT products are available, Wave differs from its competitors by being Australia's first long-life fresh tasting dairy drink.

Critical Success Factors

Four factors were critical to the project's success. Having a sound integrated business and technology strategy was backed up by having a strategic approach to identifying opportunities. As well as having the internal technological capability, internal financial resources were also required.

Impact

Consumers are continuing to support Wave, giving Bonlac a significant advantage over its rivals, as they are unable to produce a similar flavoured UHT dairy product without a large capital investment.

Bonlac has spent more than \$45 million developing its beverage division. Since buying Spring Valley in 1997, it has also taken over the licence for the Gatorade sports drink from Lion Nathan. Wave is now Bonlac's main drink brand.

Sales of Bonlac beverages are expected to reach \$100 million in 2000–01, and projected total group revenue is \$1.2 billion.

The company initially aimed for Wave to take less than five percent of the market. However sales have exceeded all expectations and the five-year pay back period on the Wave investment will be easily achieved.

Wave enabled Bonlac Foods to enter the milk based beverage market without the constraint of short shelf life. It also increased the company's presence in the single serve beverage market.

Bonlac Foods views its investment in research and development as an investment in future revenue streams for the company. It has increased its research and development budget annually for the past three years. The strategy has paid off with greater company revenue and profits.

ARNOTT'S BISCUITS LIMITED

BAKERY VISION SYSTEMS PROJECT

Each site has a champion who co-ordinates the collection of data for new products, supervises routine calibrations and trains manufacturing personnel.

The Bakery Vision Systems project was initiated by Arnott's to develop and implement technology for automated assessment of visual quality properties in baked products. The project is part of the Process Optimisation and Sensing Technologies Program conducted by the Co-operative Research Centre (CRC) for International Food Manufacture and Packaging Science, which also has the goal of developing such techniques for overall food manufacturing and packaging. Arnott's developed and implemented colour digital imaging technology to monitor and control the degree of baked-colour of biscuits.

The Opportunity

Commercial baking requires consistency in product properties such as flavour, texture and colour, to enhance customer satisfaction and retain product recognition. Assessment of these properties, especially final baked-colour, can be very subjective.

Arnott's recognised the need to make the process of assessing the uniformity of colour among baked products more objective and measurable.

Development of the Opportunity

In 1992 Arnott's commenced a project to explore digital imaging baked-colour assessment of biscuits as a method of improving the consistency and quality of manufacturing. The objective was to capture digital images and store them for comparison. The company approached a consulting firm, which in turn approached the consulting arm of Macquarie University, Macquarie Research Ltd.

In 1993 Macquarie University and Arnott's Biscuits established a baking curve that enabled the characterisation of colour development in baked products. In the case of Sao biscuits, the colour distribution for individual product samples is spread widely along the baking curve because of the differential browning of blisters and base portions of the biscuit. However, the colour distributions for samples with differing overall bake levels all lie along the single characteristic curve. It is therefore possible to measure baked-colour in terms of the distribution of sample colour along this curve.

This discovery led to the development of the self-organising neural network map to quantify the baking curve. Colour histograms along this curve are used to measure baked-colour with a further neural network trained to produce the bake assessments.

In 1995 Arnott's joined the CRC for International Food Manufacture and Packaging Science on a fee-for-service basis. The CRC is supported by government and the project qualified for the 125 percent tax concession for research and development.

During 1997–99, Arnott's gradually deployed the first prototype bake inspection instrument across a range of 70 biscuit products made in its Virginia (Queensland) plant. During this time, the research team developed the

neural networks within the bake inspection system based upon data collected by Arnott's personnel. Arnott's quality and manufacturing personnel are also trained on the use of the system, which is constantly improved with feedback provided by bakers.

Deployment of the technology in Arnott's three remaining plants follows a protocol developed from the lessons learnt at Virginia. Each site has a champion who co-ordinates the collection of data for new products, supervises routine calibrations and trains manufacturing personnel.

Critical Success Factors

The transfer of research to an industrial environment introduces many challenges. Equipment must be robust and acceptable to workplace regulations as well as easy for bakers to use. New systems need to be seen as assisting quality assessment rather than threatening the livelihoods of quality assessors.

These challenges are met and overcome by close co-operation within the CRC between Macquarie University, Arnott's Biscuits Limited and the Arnott's Virginia manufacturing team through regular meetings, joint identification of project goals and objectives and joint development of the research plan. Good communication and regular meetings between those involved in using the system and the research team ensures timely resolution of problems.

Ownership of the process by Arnott's personnel is a significant key to the system's high level of acceptance in the operating environment.

Arnott's Virginia plant manager took a personal interest in introducing the system to his plant, selecting a production line for the initial deployment where the bakers expressed interest in this new technology. He promoted the system as a way to help overcome debates about acceptable biscuit baked-colour.

Arnott's employ people specifically to champion the deployment and accept responsibility for the operation of the system. Initially performing the baked-colour assessments alone, the champion then trains bakers who find the simple user interface easy to learn.

Impact

The first industrial prototype baked-colour inspection instrument was deployed by Arnott's Biscuits Ltd in their Virginia plant in 1997. It is now routinely used to assess the bake quality of more than 80 different biscuit products. Bakers perform hourly machine inspections of product samples and use the results to adjust oven parameters or to identify and correct other problems that can affect final bake colour.

Arnott's has recently deployed further inspection instruments in other plants Australia-wide, designing them to specifications developed during this project.

Arnott's is currently establishing baked-colour standards to be used by the instruments for the products manufactured in these plants. The laboratory procedures and a fully documented software environment for establishing baked-colour standards have been delivered by this project to Arnott's, allowing Arnott's personnel full control over the process of establishing baked-colour standards.

The high fibre white bread segment is now worth \$86m in supermarket chains and comprises 16 percent of all bread sales. Wonder White is a category leader in the high fibre white bread segment, accounting for 55 percent of all sales.

GOODMAN FIELDER MILLING & BAKING

BUTTERCUP WONDER WHITE™

Buttercup Wonder White was launched in April 1994 as a true innovation in the white bread market. It was the first white bread to deliver the nutritional benefits of high fibre combined with the taste benefits of soft white bread.

Wonder White is made using Hi-maize, a natural source of dietary fibre rich in resistant starch. Hi-maize is sourced from an Australian-bred maize variety and provides the first commercially available resistant starch product in the world. The fibre is virtually invisible and is ground to a level so fine for baking that most consumers are unaware of its presence in the final loaf of bread.

The Opportunity

Goodman Fielder Milling and Baking (GFMB) commenced research into high amylose starch in 1975. The objective was to change the balance between amylose and amylopectin in starch by increasing the amylose component from the usual 25–30 percent to 70 percent.

The research involved a plant-breeding program using conventional techniques and technologies, to develop a revolutionary Australian maize starch (later to be known as Hi-maize), with an amylose content of up to 82 percent.

The research team established that the starch does not gel when boiled — it requires a temperature of 170°C to gelatinise. When bread containing the starch was ingested, the starch remained resistant to digestive enzymes throughout the human intestine, until it reached the bowel where it functioned as a fibre source with significant benefits.

In September 1993, GFMB established a taskforce to address technical, legal and nutritional issues relating to the commercialisation of Hi-maize. The taskforce identified an opportunity in the market for tasty, high fibre white bread. Consumer interest was demonstrated through a national dietary survey and consumer research.

Development of the Opportunity

Product development was based on a concept of ‘soft and fluffy’ to be attractive to children, with no perceived difference from other white bread products. This was intended to assist parents interested in enhancing dietary and nutritional intakes. Initially, in the baked product, the fibre was present in large particles that were detrimental to the bread’s keeping properties. Existing technologies were used with various enzymes to overcome the problem and this resulted in a loaf with the same softness as normal Buttercup white bread.

The GFMB marketing group observed that New Zealand had been making larger loaves using larger baking tins and consumer research indicated there was also a demand for larger loaves in Australia. It was decided to experiment

with larger tins and expand the dough in baking. The result was a bigger loaf with improved softness and texture over normal white bread.

Manufacturing with larger baking tins required substantial investment in the 37 bakeries across Australia. In addition to the capital investment, there was also substantial investment in communication and awareness of the opportunities with the new product. Once the final product was agreed, there was a concerted approach to understanding and overcoming possible resistance to change. For example, larger baking tins resulted in less bread in the ovens, changes to baking procedures and variations to protocols and guidelines.

The product was launched in April 1994. Television advertising on a theme of 'Great Taste. Invisible Fibre.' has consistently supported the product and the message is reinforced through magazine advertisements.

Critical Success Factors

The major factor in the success of Wonder White and Hi-maize was an integrated approach involving the research, marketing, product development and manufacturing (baking) teams.

The development process was highly collaborative and iterative. There was also strong and visible support from top management. The managing director of GFMB made it clear that the project was important and the project leaders were passionate about its success.

Impact

In the first six months of retail, Buttercup Wonder White increased sales of white bread in total by seven percent and the total bread market for Buttercup by two percent. Wonder White now contributes a third of sales for the Buttercup Brand, the 10th largest grocery brand in Australian supermarkets.

The use of Hi-maize has been extended to McDonalds buns, with the Hi-maize content serving to meet the food standard requirement of three grams of fibre per serve.

The high fibre white bread segment is now worth \$86m in supermarket chains and comprises 16 percent of all bread sales. Wonder White is a category leader in the high fibre white bread segment, accounting for 55 percent of all sales.

Goodman Fielder holds international patents for Hi-maize. The research and development for Hi-maize commenced as an in-house project, however Food Science Australia were involved through the CRC for Food Innovation (currently being wound up) and Goodman Fielder is still involved in research with the CRC for Food Packaging Science.

THE HOUSE OF WINSTON™

CHILLED FRESH PRODUCTS

The House of Winston specialises in fresh products — soups, fresh pasta sauces and Asian meals in a fully automated, cook-chilled system — as well as Bircher muesli. The company used innovation to develop and introduce a new product range to the Australian market.

In 1994, before any contracts had been won, the company built a \$2 million fully automated factory using technology that gives products a longer shelf life. The company combined a significant amount of equipment to produce fresh products with the relevant shelf life, which meets world standards.

The Opportunity

The owner of the company, a former Merchant Banker in London and Tokyo, recognised there was a fresh food revolution in the UK, with consumers wanting the convenience of fresh, ready to eat food. The owner had survived in London eating a Marks and Spencers soup product.

On returning to Australia, he recognised an opportunity in the Australia market for similar products.

Development of the Opportunity

To develop the product, the company committed to just under a year of market research — they started by assessing classic soups around the world. Research on the cook-chill system was undertaken at the Australian Institute of Food Science (Food Science Australia) at Werribee. The founder hired a lab, and spent four months with a food technologist. They looked at soup recipes, shelf life and the technology and process required to make soups. This gave him the initial understanding of how the product could be taken to market and the confidence to take it further.

The company was built up using expertise from local and international technology, but its uniqueness lies in how it was combined. Its unique production facility and distribution chain enabled the company to go forward in an innovative way.

Other research and development activities included studying many different factories and equipment around the world and bringing engineers from many fields to work on the various components of the production line.

In 1994, before any contracts had been won, the company built a \$2 million fully automated factory using technology that gives products a longer shelf life. The company combined a significant amount of equipment to produce fresh products with the relevant shelf life, which meets world standards. It allowed for both domestic and export distribution in ways that retain the products' quality. Shortly after building commenced the House of Winston won a contract with Ansett to provide soup to economy class passengers. This gave the company the necessary cash injection to sustain, maintain and pay for the factory.

European designed packages suitable for microwaving were used to brand the product. The House of Winston was the first to use them in Australia for soup products. The look of the packaging also defined what the product stood for and the type of products that could be launched under the House of Winston brand. The products were developed to be 'fresh, cooked-chilled, feel good foods' for busy individuals. Branding was built around identifying these core

values. The brand conveyed the essence of convenience — hassle free, ready to go, no can opener, and at the end of eating, people feel good. It has also captured a ‘home touch’ and ‘just cooked feel’.

Not only does the product have to look right and taste good but because it is a chilled product, made from fresh ingredients, it needs to be delivered quickly. This required strong relationships and processes to be established between suppliers, production and distribution. The ‘cold chain distribution system’ necessary to achieve this involved alliances with supply companies and distributors (using refrigerated transport) who deliver direct to supermarkets, including Coles and Woolworths. Strong links were established at all stages of the supply chain.

The company was producing fresh soups for the retail market in late 1994.

Critical Success Factors

People are often reluctant to innovate because of the potential risk. Europeans have a different attitude. Observing how they do business, manage risk and the constant stream of new ideas they are exposed to was a significant success factor. The success of The House of Winston demonstrates the importance of passion and commitment to an idea as well as the capacity to work effectively in cooperative and collaborative arrangements.

Winning the contract with Ansett was a critical success factor.

Impact

The House of Winston competes with international companies, such as Heinz and Nestle, with its soup range. At one stage, in 1998, Campbells Soups wanted to buy the whole company.

The House of Winston is the largest fresh soup manufacturer in Australia. It is now looking to expand to the United States where it hopes to build a plant. The House of Winston has supplied soup to Ansett economy class passengers for five years. The company also exports soups to Hong Kong for the ex-patriot market.

Through a number of innovations MLF has been able to turn consumer preferences around to the point that today most nutritionists, general practitioners and other opinion leaders comfortably talk about healthy fats.

MEADOW LEA

HEALTHY FATS AND OILS

Goodman Fielder is the largest Australian-owned food company, producing many of Australia's and New Zealand's brands. Major product areas include flour, bread and other baked goods, cereals, snack foods, margarine, edible oils, sauces, dressings, Asian cuisine, pasta, cake mixes, desserts, gelatine, starch and food ingredients. Goodman Fielder brands include Uncle Toby's cereals, Buttercup bread, White Wings cake mixes, Bluebird snacks and Meadow Lea margarine.

The Opportunity

During the late 1980s, fats and oils used in snack foods, fried foods and other foods were made almost exclusively from palm oil and tallow which are classed as saturated fats. Saturated fats are regarded as unhealthy and a widespread belief grew among consumers that all fats were unhealthy.

However, by being aware of research developments, Goodman Fielder and its Meadow Lea Division could see the potential opportunity for products using healthy fats. This enabled them to implement a significant development program and market a range of products targeted at consumer health interests.

Developing the Opportunity

Meadow Lea Foods (MLF) adopted a step by step process towards innovation and product development. Each step made a contribution before the next step was taken to embark on a new initiative.

For example, Meadow Lea's awareness that packaged food manufacturers required products with long shelf life and an ability to bear temperature movements encouraged and helped the company to develop oil with good nutrition and long shelf life. Having achieved success in this area, the next step was to develop the technologies further for use in food. This led to the development of the Healthy Fats Program and a range of MLF products, Gold'n Canola, Sunola and Logicol.

There were a number of events that facilitated the development of the Healthy Fats Program, foremost being the support from the Grains Research & Development Corporation who agreed to match Meadow Lea's research program dollar-for-dollar. Other events included the changing of dietary guidelines for Australia in 1992 from 'avoid eating too much fat' to 'eat a diet low in fat, particularly saturated fat'. The National Health and Medical Research Council also recommended using omega-3 and omega-6 polyunsaturates. Further research showed that omega-3 polyunsaturates improve the cardiovascular and immune systems.

The launch of the Gold'n Canola brand was based on the health properties of canola oil, which is low in saturated fats and contains a good balance of both omega-3 and omega-6 polyunsaturates, and the use of medical researchers to inform consumers.

MLF then worked with Pioneer Hi-Bred Australia Pty Ltd and Cargill Australia Limited to establish an industry based on a variety of sunflower oil (high oleic variety) called Sunola. Sunola was launched in 1995 and sales have grown steadily.

In 1999 MLF was the second company to launch spreads containing plant sterols. Plant sterols block the absorption of cholesterol. Many consumers concerned about their cholesterol levels now use these spreads. A range of products has also been launched under the Logical brand and this is giving MLF the opportunity to enter the functional food area.

Through a number of innovations MLF has been able to turn consumer preferences around to the point that today most nutritionists, general practitioners and other opinion leaders comfortably talk about healthy fats. A health segment within the margarine category has been established and continues to grow.

Clinical studies at the CSIRO and various hospitals, product development and marketing combined to build MLF's reputation as the healthy fats company.

Critical Success Factors

Goodman Fielder's approach to innovation has involved a 'step by step' strategy for technology and product development that integrates science and marketing capability. It has been a collaborative process, requiring the involvement of people who can understand technology and marketing aspects both inside and outside the company. This took time to develop.

MLF's cooperative development program involves 10 research collaborators. Competitors have now taken up MLF technology in their own brands. The challenge is to keep innovating and maintaining a 'speed to market' advantage. The 'staircase' approach has been successful in MLF staying ahead in a highly competitive sector.

Impact

The success of the MLF Healthy Fats Program has not been a single innovation but a combination of steps to position Meadow Lea as the 'Healthy Fats & Oils Company'.

Gold'n Canola is the third largest selling brand in Australia and continues to grow market share with sales currently in excess of \$25 million.

In 1999 more than 50,000 tonnes of high oleic sunflower grain was grown. This is more than 50% of the total sunflower crop and has helped to sustain the Australian sunflower industry.

GOODMAN FIELDER MILLING & BAKING

NATURES GOLD™

Nature's Gold is a nutrient-rich extract of a by-product of wheat milling that has been developed as a functional food ingredient. It is the result of combining beneficial ingredients in a natural format to produce a whole food product.

The success of Nature's Gold reflects an ongoing commitment over a 15 year period. The business unit management provided a great deal of encouragement to keep the project going.

After many years of research in the alternative uses for the bran layer of wheat, Goodman Fielder Milling & Baking (GFMB) perfected a novel milling system for capturing the nutritious components of the milling by-product.

The Opportunity

It is well known that the bran layer surrounding grain, historically discarded after milling, is a rich source of nutrients. Unfortunately, the fibrous nature of bran makes it difficult to consume as a raw product and in the past it was so unpalatable it was often not even added to cereals. In 1985 GFMB, keen to find a use for the bran by-product, began examining possible methods of extracting the nutrients from the fibrous tissue, for easier human consumption.

Development of the Opportunity

Within the bran husk, surrounding the grain seed, is the layer called aleurone. GFMB initially concentrated on establishing the nutritional benefits of bran, in particular, the beneficial health impact of vitamins and minerals contained in aleurone. Aleurone contains many vitamins, including the B-complex vitamins folic acid (folate), thiamine and niacin, and the minerals zinc, iron and selenium. It also contains several of the lipid organic compounds.

A technique was developed to isolate the aleurone which involved cutting through the aleurone cell walls to unlock the nutrient contents and then separating the contents from the fibrous grain layers. Simultaneously, the wheat germ is ground to small fragments and recovered with the aleurone cell contents.

It was discovered that although whole-grain foods provide a certain amount of the aleurone nutrients to the consumer, by isolating the aleurone cell contents, the nutrients, especially folate, are concentrated into a highly nutritious and easily absorbed ingredient.

Isolating aleurone involved some changes to the milling technology. GFMB had to be able to grind the bran finely enough to release the nutrients. Once isolated, the aleurone was difficult to handle as it was sticky and didn't flow, so new material-handling systems were also created to recover it in commercial quantities. Further, a stabilisation process was developed to ensure the nutrients remained bio-available.

When aleurone is exposed to air, quality usually deteriorates. To ensure the bran remains stable, a light steaming process was developed to protect the nutrients. Following steaming, the aleurone is converted back into a dry form and stored at room temperature in 25-kilogram bags. The recovery process is

applicable to all wheat types and grades. The resulting product is totally natural and rich in nutrients. Registered and sold as Nature's Gold, it is used in a range of food products.

The characteristics of Nature's Gold are such that it is classified as a functional food ingredient. However, while the role of certain minerals and vitamins in Nature's Gold are well understood, there is incomplete knowledge of the role of other minor minerals and micro-nutrients in the product and their possible synergistic action in influencing human health.

To prove the value of Nature's Gold and conduct further research on the lesser known qualities of aleurone, GFMB is undertaking a \$2 million nutritional study with CSIRO's Food into Asia program to evaluate its potential benefits and nutritional credibility. The research program is also looking at the ability of Nature's Gold to reverse DNA damage and improve bowel health.

Critical Success Factors

The success of Nature's Gold reflects an ongoing commitment over a 15 year period. The business unit management provided a great deal of encouragement to keep the project going. In addition, Goodman Fielder has a very supportive research and development culture, with R&D managers from each of the business units meeting regularly.

Impact

Nature's Gold is used in several Goodman Fielder products, including the very successful Uncle Toby's VitaGold bread and pasta noodles. GFMB is considering including Nature's Gold in more of its branded products such as Healthwise.

The company sells Nature's Gold to commercial customers where there is no conflict of interest in the product range.

Goodman Fielder is pursuing several export opportunities, including discussions with Japanese trading houses as a possible target for Nature's Gold. Several large European retailers are also stocking the product as part of a market test.

MURRAY GOULBURN COOPERATIVE LIMITED

WHEY PROTEIN ISOLATE

Murray Goulburn is Australia's number one exporter of processed food and accounts for six percent of world trade in dairy products. This is a story of how they utilised an innovative approach to convert a potential business liability to a major profit centre.

Whey Protein Isolate (WPI) is a multi-functional food ingredient, produced using ion exchange technology that is exclusive to Murray Goulburn. It provides benefits ranging from general to clinical nutrition.

The Opportunity

Ten years ago the Murray Goulburn Cooperative was making up to 35,000 tonnes of cheese but doing very little with the whey residue. Only 10 to 15 percent of the whey was used in sales and distribution, mainly for pig food.

The unused whey represented a high potential cost to the company because of environmental concerns about disposal of waste products. In 2000 the company is making almost 100,000 tonnes of cheese, recovering and using 90 percent of the whey in manufactured products.

The turnaround came with the recognition that whey is a valuable 'biological cocktail' and processing whey could add to returns. Whey Protein Isolate (WPI) is a multi-functional food ingredient, produced using ion exchange technology that is exclusive to Murray Goulburn. It provides benefits ranging from general to clinical nutrition and assists functional performance in the areas of emulsification, aeration, foaming, water binding and whipping.

It has a protein content of over 90 percent on a product basis and whey proteins are rich in amino acids, which makes them valuable ingredients in formulating foods with a high nutritional impact. The product can optimise total protein utilisation in a specific product or in meal preparation. Its largest use is currently in powdered form in health beverages and is popular among body builders.

Development of the Opportunity

Development of the opportunity required applying new and emerging technologies in a strategically focussed process and product development program. The effective management of limited R&D resources was also required. In 1995, an international market survey commissioned by Murray Goulburn identified substantial market opportunities in speciality dairy proteins.

As a result of this Murray Goulburn acquired the exclusive rights in Australia for the engineering component of the technology required from a US company.

They also entered into a joint research project with Food Science Australia to develop the process technology to achieve efficient protein recovery. The cost of the R&D program over three years was approximately \$3 million. The project received a \$740,000 R&D START Program Grant from AusIndustry.

Critical Success Factors

Critically important also was an alliance between Murray Goulburn and its distribution companies to develop and market the product. Murray Goulburn's business strategy is to concentrate on producing specialty food ingredients rather than retail-ready products for the global market. The company has good technologies for manufacturing milk products, but does not have the marketing infrastructure to support consumer products in global markets. This points to the importance for Australian firms to develop strategic alliances through the value chain.

The success of the project can also be sourced to an effective R&D and innovation management strategy, including effective links with the production and marketing areas of the company's operations.

Impact

Commercialisation of the process began in 1999 at a cost of around \$15 million. The company installed the plant at its Cobram site and presented product to the market early in 2000. Full production started in May 2000.

The company reported in its 1999 Annual Report that customers have responded favourably to the successful commercialisation of whey fractions and additional protein variants. Market interest is growing, with whey fractions and protein variants expected to develop into an important segment of the company's ingredient business.

Murray Goulburn is now moving to the next stage of development of whey protein to try to obtain more of the higher value biologically active components.

AUSTRALIAN FRESH FRUIT COMPANY

TEMPERATURE CONTROL IN SHIPPING CONTAINERS

This project has been exploring ways to ensure that airflow and temperature surrounding the fruit within containers remains uniform and closer to optimum conditions.

Australia's fresh fruit industry is estimated to be worth \$2.9 billion annually. Helping to capture opportunities for everyone in this industry — from nurseries and breeders to retailers and consumers — is the Australian Fresh Fruit Company (AFFCO), Australia's leading fruit network.

The total value of fresh fruit exports within the network is about \$120 million, and these exports are expected to increase in the near future. This increase will be supported by the development of technology to enhance the fresh fruit market chain by improving the transport conditions for export produce. This technology is being developed in a 'Food into Asia' project supported by AFFCO.

Food Science Australia's Dr Nevin Amos, on behalf of AFFCO, has been leading the project. It aims to develop systems to ensure Australia's fresh fruit is delivered into export markets with a higher and more consistent quality than our competitors.

The Opportunity

Following AFFCO's formation in 1995, it became apparent that there was a need to coordinate the export program of Pink Lady and Sundowner apples to the United Kingdom. This Australia-wide export program has the objective of maintaining uniform standards in fruit quality and packaging, and ensuring that Australia provides only premium-quality Pink Lady and Sundowner apples for export.

Development of the Opportunity

A research partnership, involving AFFCO, CSIRO-Food Science Australia, Orient Overseas Container Line Ltd, Visy Board and the Victorian Institute of Horticulture Development has developed technology that will ensure Australian fruit exporters can deliver fruit at a consistent quality, superior to that of our international competitors (eg, New Zealand, USA).

The technology is aimed at allowing exporters to achieve precise control of conditions in 40-foot containers. Currently, while the overall temperature of a container can be controlled, there can be significant temperature variation between regions within the container when stowed with fruit. This project has been exploring ways to ensure that airflow and temperature surrounding the fruit within containers remains uniform and closer to optimum conditions.

OOCL is providing refrigerated shipping containers for trialing within Food Science Australia's Container Test Facility in Sydney, and also providing containers for actual export trial shipments. Visy Board is providing test cartons and will undertake mechanical strength tests in its new Paper and Packaging Technology Centre. The VIHDI has been working with CSIRO-Food Science Australia to develop systems for maintenance of product quality, even over long distances to hot climates.

Trial shipments of fruit have been sent to Asia and the United Kingdom.

The research will also provide the basis for Australian fresh fruit exports to capture a world hygiene advantage into Asian markets through development of non-chemical means to control pests during transit, thus leading to further Asian market access.

Critical Success Factors

The voluntary cooperation among AFFCO growers, packers and exporters, and the coordination of the research organisations and other companies have proved critical to the success of this on-going project.

AFFCO's former Chairman, Bill Joyce, has reported that the project 'achieved a level of coordination never before attained in Australia' (AFFCO News, Spring 1997, p. 3). Without this level of coordination and cooperation it would not have been possible to develop and implement the project.

Impact

AFFCO's involvements with the 'Food into Asia' program and CSIRO-Food Science Australia, OOCL, Visy Board and the Victorian Institute of Horticulture Development, have enabled it to develop another area of competitive advantage and to increase its credibility with customers. AFFCO recognises that there are many areas in the fresh fruit value chain that need to be right to maintain satisfied customers.

Riversun members are spread across the three major growing districts in the southern part of the country, and together with regional grower groups have the ability to communicate and implement rapid change when necessary.

RIVERSUN EXPORTS

CITRUS FRUIT EXPORTS

Riversun Exports Pty Ltd was established by a group of citrus exporters and packers in 1992, to coordinate citrus exports to the newly opened US market. In its first season it coordinated fruit from 10 packing houses and by 1997 that number grew to 37, with its volume representing approximately 98 percent of all Australian citrus exported to the USA.

The Opportunity

The founders of Riversun recognised individual exporters and packers had little chance of being able to supply even smaller segments of the retail sector. The requirement for large volumes, often in restricted size ranges, and the ability of Australian packers and exporters would not have provided the reliability and consistency of product to retailers without a coordinated approach. The requirement for consistent quality fruit provided an opportunity for the members to develop standard quality parameters, providing them to all participating packers in a manual.

Development of the Opportunity

In December 1995, the seven original partners in Riversun commenced discussions with growers in the Riverina and Sunraysia, with a view to expanding the network and increasing the scale of operations.

In 1996 the company obtained support from the then Department of Primary Industries and Energy (now AFFA) to expand the existing network of citrus exporters to increase export volume, and other economies of scale, for the US market. They also worked together to address quality assurance procedures and quarantine protocols required to meet the US market specifications, including an update of the Riversun quality manual. In addition, they refined the marketing and distribution procedures for the US retail sector.

Single brand identification and the need to provide co-ordinated and reliable supplies were recognised as major factors in attaining market acceptance. Packaging is standardised for all fruit in the group, with cartons bearing the Riversun brand as well as identifying the individual exporter in the group.

Riversun makes a substantial commitment to marketing and promotion as part of its commitment to the retailers. Every endeavour is made to secure the confidence and support of the retail sector through the consistent and reliable delivery of quality fruit. Development strategies are based on analysis of opportunities, risk, and exposure. The appointment of an agent and sub-agent to handle all marketing, thereby strengthening the marketing through increased flexibility and reduced competition, is one of a number of benefits to partners.

The company is structured so that all partners know their roles and responsibilities. There are written policy guidelines that outline the specific responsibilities to shareholders. Regularly updated protocols are also set out for shareholders. The arrangements are designed to be flexible enough to accommodate changes that arise out of doing business.

Riversun members are spread across the three major growing districts in the southern part of the country, and together with regional grower groups have

the ability to communicate and implement rapid change when necessary. This allows Riversun to keep its customers satisfied and to stay ahead of the competition.

Technological innovation has also played an integral part in Riversun's success. The company developed a barcode system that scans pallets as they are loaded onto ships, allowing products to be traced from the grower right through to point of sale. The system provides accurate and efficient stock management, and enables Riversun and its members to monitor pallet movements continuously.

Riversun also provides funding for research into post harvest controls and pest management, and is actively involved with the peak industry body Australian Citrus Grower Inc, state citrus organisations and various research organisations, to develop improvements in the growing, harvesting, packing and marketing of citrus for international markets.

The company has made substantial investments in:

- The preparation and distribution of a Quality Assurance Manual to all shareholders covering key attributes of the products such as colours and sizes, and detailing procedures to ensure compliance with quarantine protocols;
- The appointment of QA Inspectors to the three regions with responsibilities including spot audits and training in packing sheds;
- The requirement for all pack-houses to have implemented audited HACCP procedures for the 2001 season; and
- The appointment of an Operations Manager in San Diego to monitor the operational processes of vessel discharge, arrival quality inspections, warehousing, distribution and marketing, and to liaise with the agent and sub-agent on issues affecting marketing plans and strategies

Critical success factors

The major criteria for success have been an overriding commitment to the quality of a premium product and to maintaining continuity of supply. Cooperation and collaboration among the local companies, particularly between Riversun partners and the citrus industry, in participatory decision making strategies was also beneficial.

Riversun exploited an opportunity through product promotion and quality assurance, and used a single US Import license to market into the US. Finally, the availability of dedicated expertise in all areas of Riversun's operations was vital.

Impact

The key results of the project are:

- Sales to the US have gone from 100,000 cartons in 1992 to 1.75 million cartons in 1998 and returns to growers have been not only higher, but more stable;
- Resolution of USDA quarantine issues, including redefining Australian fruit fly zones;
- Introduction of Tangelos, Ellendale Tangors and Murcott Honey Mandarins into the US market; and
- Expansion into other markets, including South Korea.

In 1995, another freshcut salad operation had been established in Bairnsdale in Victoria. The Vegco operation was five times larger than Harvest FreshCuts and utilised state-of-the-art technology, also from France. Harvest realised there wasn't room for two operators in Australia.

HARVEST FRESHCUTS

FRESH SALADS AND VEGETABLES

Harvest FreshCuts is an award winning, leading manufacturer of fresh, minimally processed salads and vegetable stir fries — freshcuts. Rob Robson, CEO of Harvest FreshCuts, has been at the leading edge in supplying fresh produce for more than 25 years. Since establishing a wholesale operation based in the Brisbane Markets with his brother in 1975, Rob and his team have led the way for fresh produce innovation, introducing field representatives at grower level and installing vacuum coolers in Australia's primary growing areas. As the first produce organisation in Australia to establish an in-house marketing and promotions department, Harvest was a step ahead of the rest, marketing products directly to the consumer. Other innovations include tailor-made produce industry computer programs, and personal development and industry based sales training for all team members.

The Opportunity

Harvest has always looked throughout the world for sources of inspiration for innovation. In the late 80's and early 90's, Rob Robson recognised that the traditional produce supply chains in the US and Europe were changing from centralised market systems to direct supply to customers. Harvest knew it was only a matter of time before the Australian produce industry would follow suit. At the same time, Rob's travels introduced him to the world of freshcut salads and vegetables. Minimally processed vegetables were fast becoming a significant proportion of produce department sales at retail outlets in overseas markets. This was the opportunity to establish an operation outside the central market system.

In 1994, a representative of the Australia retail sector stated that freshcuts would constitute 10–12% of fresh produce department sales in two years. An increase from 0–12% in two years represented millions, and suddenly the market potential for freshcuts in Australia was recognised. Harvest realised the need to act quickly.

Development of the Opportunity

In 1993, Harvest undertook preliminary investigations into consumer demand for processed vegetables and salads. This was followed by extensive international freshcut research in countries such as Britain, Europe and the United States. Investigations overseas lead to a Californian wholesaler who had made the transition from wholesaling to establishing a freshcut operation — precisely what Harvest had in mind.

Through this contact, Harvest was introduced to European freshcut technology from Scalime. Investment in Scalime technology would cost millions of dollars, a huge investment for a small Australian company that had a vision.

Further discussions with Scalime resulted in a licensing agreement being signed in September 1994, giving the company exclusive manufacturing rights to the technology in Australia, New Zealand and South East Asia.

After purchasing the land on which a state-of-the-art FreshPlant was to be built, Harvest faced the next challenge of funding the \$4 million required to construct and operate the company. After considering 53 different funding

options, a 50% equity deal was negotiated — Harvest FreshCuts was born. During the first 18 months of operation, consumer demand for these new products was slow and Harvest FreshCuts lost \$3 million. As a result of this slow demand, the equipment was not being fully utilised and the processing line would run for only 20 minutes each day.

It became apparent that profits were only possible if volume increased. In 1995, another freshcut salad operation had been established in Bairnsdale in Victoria. The Vegco operation was five times larger than Harvest FreshCuts and utilised state-of-the-art technology, also from France. Harvest realised there wasn't room for two operators in Australia. The opportunity arose for discussions to begin about the potential for these two organisations to join forces, rather than compete. Vegco had just received venture capital investment from Rothschild Australia.

Harvest FreshCuts and Vegco merged in October 1997 with the two companies exchanging 50 percent each. Rothschild Australia became an investor in the merged entity. Combining the two companies was a major turning point for the business.

The combined strength of the two operations, together with the increased scope to supply major metropolitan centres with product, established Harvest FreshCuts as Australia's only national freshcut operation.

Harvest's commitment to supplying consumers with products they want, rather than products that the grower could sell, sets it apart in the fresh produce industry. Research played a vital role in much of Harvest's success. Harvest FreshCuts undertook market research in 1999, with the assistance of HRDC and Meat and Livestock Australia. Harvest FreshCuts discovered that the majority of meal decisions were made in the meat department of supermarkets and that 65% of consumers bought vegetables once a week to make a stir-fry mix. To maximise this opportunity, Harvest FreshCuts launched four new freshcut stir-fry mixes that are exclusively merchandised in retail meat departments.

Further developing Harvest's research, three team members joined an Australian Government mission to the Netherlands in June 2000 to study Supply Chain Management and Efficient Consumer Response.

Critical Success Factors

By sharing a common vision with all people and partners in the supply chain, Harvest were able to encourage greater collaboration and cooperation from people, particularly with growers. This also made the company very responsiveness to market demands.

Also important was having the passion and commitment to achieve a goal, without being out of touch with reality and the rules of business. It helped that they worked at being world class and supplying a product with integrity.

Impact

Since starting production in September 1995, Harvest FreshCuts has grown its Australian market share to secure approximately 75% of the retail freshcut market and currently supplies major retail chains and food service organisations in Australia.

In 2000–2001, Harvest FreshCuts forecasts \$37 million in sales. The company employs more than 250 people in two processing plants and is the most technologically advanced freshcut processor in Australia.

The corporate strategy and planning process is underpinned by a performance appraisal system that is linked to a bonus system based on individual and to a lesser extent team performance.

NATURES WAY FOODS LTD

LANGMEAD LETTUCE FARM

Natures Way Foods Ltd (NWF) supplies semi-processed packaged salad lines to Tesco grocery stores and McDonalds in the UK. Two entrepreneurial brothers set up the company — one had a background in marketing for global packaged goods and the other had experience in farming lettuce.

The Opportunity

Langmead Farms was recognised as the largest whole-head lettuce supplier and one of the top producers of fresh produce to Tesco retailers in the UK. Tesco invited David Langmead (owner and manager of Langmead Farms) to add the supply of bagged lettuce and leaf salads to their contract.

David realised that providing semi-processed foods to Tesco was going to require more than his skills in quality production and turned to his brother Robert for advice. Together the brothers set up NWF with David and Langmead Farms initially providing most of the produce and financial support for the new venture and Robert managing the company.

NWF agreed to supply one million bags of lettuce per annum to Tesco for a two year trial.

Development of the Opportunity

The first processing plant was established on site at Langmead Farms and the performance of the new plant so impressed Tesco that they offered NWF further opportunities to provide a range of other bagged salad lines to its stores.

Within a few years NWF expanded its production capacity and opened a second processing unit. The first establishment was then upgraded to process even more high quality product.

While consolidating business with Tesco, NWF also sought opportunities in other food sectors. NWF demonstrated successfully to UK McDonalds its commitment to quality and integrated supply linked to full traceability. McDonalds offered NWF a trial to provide the lettuce for 25 Southern England stores.

The control over transport and cooling systems from farm to retail outlet proved vital to the consistent provision of quality produce and enabled NWF to provide bagged salad products with a shelf life of about 8 days.

The company is constantly seeking further extension of the shelf life. Rather than spending money on R&D to produce revolutionary techniques or systems to improve shelf life, the equipment available on the market is regularly surveyed. In particular the success of equipment and processes being used by competitors or related industries is assessed.

NWF regularly undertakes trials of leaf mixes in conjunction with Tesco's consumer panels to meet flavour and texture profiles desired by consumers, while maintaining quality and meeting cost parameters. UK McDonalds approach to maintaining customer satisfaction is based on a whole-of-chain

process, so NWF is involved in developing sound relations with other McDonalds suppliers, for example the meat, cheese and bread providers, to develop 'whole-of-product' solutions to customer dissatisfactions.

Initially the small size of the business and having one key supplier meant management and communication of knowledge was a fairly simple operation. Once the supplier base was extended to ensure the provision of a wide range of salad leaf throughout the year the company had to improve the management and transfer of knowledge. For example, Spanish suppliers were introduced to new farming practices, customer-focussed quality management and traceability systems to ensure year round quality provisions. NWF invested in specialist staff and IT resources to manage the plethora of information required in both directions.

Knowledge about product and service requirements and performance were directed to staff on a day-to-day basis and accurate financial, logistical and quality records were vigilantly maintained to enable NWF to respond immediately to customer enquiries.

Internal communication systems to encourage the flow of information and ideas have been implemented by NWF.

The corporate strategy and planning process is underpinned by a performance appraisal system that is linked to a bonus system based on individual and to a lesser extent team performance. A training program introducing staff to the concept of individual work plans and performance rewards is expected to promote opportunities for individuals to acquire skills and experience in key business areas. A core competency framework has been developed to identify expected skill requirements for managed growth and to achieve the company's goals for the next three to five years.

Critical Success Factors

NWF adopt and adapt the best products and techniques for their consumers and ultimately for the benefit of the company. They rely on their relationships with customers and a clear understanding of customer requirements in order to be as responsiveness as possible.

The company's aim to continually exceed customer expectations is recognised as vital to NWF's development, competition and success. Exceeding customer expectations requires the company to continually question their product and what NWF can do to make a difference (for example, would square leaves for the prepared sandwich businesses be useful to the customer).

Committed staff, who are always seeking better techniques for production, processing and servicing, as well as offering advice for bettering the business management systems are critical to the success of their business.

Benchmarking against competitors and related industries is also an important element of success.

Impact

NWF supplies 40% of Tesco's packaged salad lines in the UK.

The company successfully completed their trial with McDonalds in 25 stores and now supplies 50% of the 'shred' for UK McDonalds in over 500 outlets.

To reduce the expense of replacing or improving processing machinery, Parle Foods bought equipment from multinationals that had been disposed of for scrap material and then adapted the equipment for its own specific uses.

PARLE FOODS

VEGETABLE PROCESSING

Parle Foods has, in a very short time, built scale and applied technology to capture more of the small margin available in the fresh vegetable processing market. The company aimed to be the lowest cost producer in fresh foods by applying innovation to a basic commodity to be more competitive in the market.

The Opportunity

The opportunity for the company to gain success in the competitive processed vegetable industry began with pickled gherkin production and a desire to defeat the challenge of competition by using novel technologies and innovation to dramatically cut operating costs.

Development of the Opportunity

To improve the yield of the cucumbers destined for gherkin production and decrease water wastage, an underground drip irrigation system was designed and installed. This system watered the roots directly and prevented evaporation of valuable irrigation supplies. The computer-controlled drip irrigation system also enabled water-soluble fertiliser to be applied directly to the roots. The result was an increase in yield of 4.5 times that of conventionally grown cucumbers. The increased yield created harvesting difficulties which Parle Foods solved by designing and building a harvester that could harvest three rows at a time — hastening the harvesting process and again reducing the cost of production.

Due to the acidity of the solution for pickling cucumbers, the brining process typically requires the use of specialised tanks made of fibreglass. Parle Foods constructed a ‘purpose-built’ tank at substantial expense and after further consideration of the design and limitations, the tank was superseded by a deep hole in the ground, lined with industrial grade plastic.

To reduce the expense of replacing or improving processing machinery, Parle Foods bought equipment from multinationals that had been disposed of for scrap material and then adapted the equipment for its own specific uses. Similar innovations were developed to reduce overheads in other areas of production.

Parle Foods formed alliances with larger companies with marketing and promotional infrastructures, so they could extend the sales of their lower cost products.

The company quickly realised the need to maintain customer satisfaction to retain their business. One of the most important customer satisfaction criteria is the reliable supply of quality product to satisfy any demand or requirement, regardless of seasonal or regional conditions. To meet this challenge, Parle Foods integrated backwards with a company named AgReserves Australia, to provide most of the raw produce for processing. AgReserves Australia owns, among other horticultural enterprises, Kooba Farm who supply a majority of the raw produce required by Parle Foods. During seasonal and/or regional difficulties, Parle Foods sources supplies from other areas across the country.

Critical Success Factors

The company is driven by the goal of success. The achievement of the task and the returns are seen as the primary measure. Critical to Parle Foods success has been the innovative and pragmatic application of ideas to achieve the lowest cost structures — increasing economies of scale, but keeping overheads small. Alliances with ‘bigger’ partners have increased exposure and extended sales.

Involvement of growers in the business has created an essential link between the grower and the market.

A dedication to maintaining business, by producing reliable commodities on demand, and a passionate and dedicated leader have also been crucial.

Impact

In 10 years from its first pickled gherkin, Parle Foods has replaced the manufacturing of a national corporation and replaced imports from New Zealand with a locally manufactured product. The company has also entered into a joint venture agreement with Heinz-Wattie where Parle Foods owns 40 percent of Heinz-Wattie Frozen Foods Australia. The company processes and supplies the frozen vegetables and Heinz-Wattie markets them. They are now exporting, with Parle Foods having taken over the manufacturing of certain crops on behalf of Heinz-Wattie. Other arrangements have been developed in some vegetable lines for Unilever, Nestle and McCain.

Kooba Farm, of AgReserves Australia, has also purchased 20 percent of Parle Foods. In this way, Kooba Farm is closely involved in the business and knows ahead of time what is required, so Parle Foods is usually able to secure their supply.

A thorough understanding of how co-operatives work and how markets are changing on an international scale is also recognised as being important to competitive success.

FEDERATION OF DANISH CO-OPERATIVES

CATALYST FOR INNOVATION

The Federation of Danish Co-operatives (FDC) represents co-operative organisations primarily involved in the Danish meat, dairy and farming supply industries. The commitment to co-operative business structures is in part the result of a long-standing culture of co-operative development in Denmark. There is also a strong belief that co-operatives deliver better prices to farmers.

The FDC facilitates innovation in industrial sectors by identifying social, business and political factors that impact on the competitiveness of each sector and providing 'model solutions' to improve business outcomes for its members. In particular the FDC focuses its services to members on improving the capacity of the Danish co-operative sector to respond to changes in the external business environment and expand its competitive capabilities.

The Opportunity

A review of strategic industry challenges conducted by FDC in 1996 concluded that innovation in business structures and processes is stimulated by a wide range of external factors.

Retail trade concentration and the trend to support regional supply networks has created a need for processed food suppliers to achieve greater volumes, more consistent quality and substantial product differentiation.

Discerning consumers concerned about animal welfare, organic production and chemical additives in the supply chain have created new preferences and patterns of consumer demand.

Ever-tightening environmental regulation has the potential to significantly restrict the expansion of the Danish agricultural sector, in turn pressuring the food industry.

Competition policy requires Danish enterprises to comply with strict EU competition rules and additional domestic controls under the Danish Competition Authority.

Modern biotechnology and development of Genetically Modified Organisms are areas that the Danish agriculture and food industries will continue to explore as a potential source of innovation in production and processing.

The FDC recognised the need for its co-operative members to understand how to address the external factors affecting their businesses. They acquired information about how to resolve issues related to business structure, equity and collaboration with other co-operatives and enterprises and made this information accessible to their members to facilitate innovation and competitiveness in their industries.

Development of the Opportunity

In response to the external influences identified above, the FDC encourages Danish co-operative industries to remodel their business forms and functions by consolidating to improve their competitiveness and equity, by increasing

their understanding of internationalisation and related market trends and by developing further diversification and differentiation to meet customer requirements. The FDC also highlights the importance of procuring sufficient capital to enable developments and to ensure reliable and responsible governance in co-operative structures.

Danish co-operatives seeking to develop new business opportunities are finding that greater equity capital is a precondition for support of projects such as diversification and/or internationalisation, due to lender perceptions of higher risk and long term commitments. Most co-operatives do not seek external capital options, like investors, owing to apparent conflicts of interests between investors and co-operatives, so increasingly member equity consolidation strategies are being explored by co-operatives. The FDC is actively pursuing procurement models that will ensure a close coherence between the need for capital and the development strategy of the co-operative enterprise.

In conjunction with liberalisation of trade and currency movements, competitive pressures are increasing the focus on how Danish co-operatives can best internationalise sales, production and development. The FDC identified export, alliances, direct investments and trans-national co-operatives as being the four major forms of internationalisation.

Critical Success Factors

Critical success factors for the Danish co-operative sector, including food co-operatives, are the ability to obtain sufficient finance to enable as much strategic freedom as possible, the acceptance of generational change and the development of effective networks.

A thorough understanding of how co-operatives work and how markets are changing on an international scale is also recognised as being important to competitive success.

The FDC also feel their careful relationship management with co-operative members, the Danish Agricultural Council, the Education sector, and international trade organisations are essential to the success of Danish co-operatives. Strong communication capabilities, making use of a wide range of media including the internet, videos, CD-roms, pamphlets and newsletters, to disseminate information to its members and key stakeholders is also considered important.

Impact

Globalisation in the retail trade and the trend to regional supply networks have been identified as a predominant force behind the emergence of transnational co-operatives. The largest of many transnational co-operatives formed in the EU has been the merger between the Swedish Dairy co-operative Arla and the Danish MD Foods. For both co-operatives, the national growth potential had been exhausted, so they continued their development on an international scale. Improved competitiveness has also been achieved by reducing the number of co-operatives. The remaining larger Danish co-operatives have responded to changes in the external environment and followed market trends by initiating various forms of differentiation of products for specific customers and markets. Multiple-string co-operatives now provide a range of product of varying specification to meet discerning customer requirements.

The focus of innovation across CSM's business portfolio reflects its assessment of the relative business potential in terms of growth and profitability, leveraging qualities and the dynamics of competitive marketplace and consumer trends.

CSM FOODS

PRODUCT AND BUSINESS INNOVATION

CSM is a Dutch corporation operating internationally in the development, processing, marketing, and distribution of processed food products and ingredients, particularly within mature sectors of the food industry. The company was established 135 years ago and presently employs about 10,700 people in Holland, other European countries, USA, Canada, China, Japan and Singapore.

The Opportunity

CSM recognises mature sectors of the food industry have limited opportunity for category growth and believe improving market share and driving cost reduction are critical to the achievement of profitable growth in these sectors. CSM also considers accurate assessment of and response to consumer drivers, to be vital in increasing the value of a product category. Overall, innovation throughout the business portfolio is the fundamental element of success and CSM maintains a goal of best practice in food innovation.

Development of the Opportunity

CSM have determined that business success lies in a combination of factors including the timing and quantity of implemented innovations, the support of a brand strategy, effective teamwork across business units, and a common 'language' within the company.

CSM demonstrates both technology based (innovation looking for an opportunity) and solution based (opportunity seeking a solution) approaches to innovation to meet customers' needs better than the current services or products provided. Innovation is not necessarily about a world-first or life changing event for consumers, but often involves 'fusing ideas', or 'stealing' concepts from another market or category. Smart stealing is achieved through effective networking.

To promote market research and enable performance monitoring, CSM developed Value Creation teams of staff members representing R&D, marketing and purchasing, to scan the world for innovative ideas in food (and similar) businesses. The best 'stolen' ideas are forwarded to operational managers and evaluated for further development. The success levels of any further developments are also recorded on a database and create a benchmark to allow assessment of CSM innovative performance.

'Time to market' for an innovation is an increasingly critical element in the competitive marketplace and CSM have determined effective co-operation and teamwork as the critical elements to success. The company production teams (for each product area) comprise an operational manager, a value creation team and an external project manager to ensure implementation of the innovation.

CSM has developed a framework of Centres of Competence, based around technology focussed factory sites throughout the world. These allow CSM production teams to exploit the benefits of accessing international technical expertise for the formation of innovative products, whilst maintaining decision capacities and the achievement of business goals within the local business

group. In addition to optimising internal technical competence, CSM is creating alliances and collaborative partners across industries and national borders.

CSM seek to create new brands and reposition existing brands, as well as improve product functionality. CSM believes there is tension in brand development, particularly in Europe, between supporters of unification and 'global' brands and a growing number of 'nationalist' consumers favouring strong national and regional brands. At the core of CSM's successful growth has been its ability to identify viable areas of the food industry that it can profitably own, respecting the value of local brands as central to its corporate equity. CSM acquisition companies are frequently local or regional brands dominant in the marketplace. Where there is no dominance the company often acquires small (even family based) companies and consolidates to create a local brand leader.

Food safety is a particularly important issue in the fresh food and catering sector. However the detection of contaminants, for example pesticidal, processing or packaging chemicals and natural toxins like aflatoxin, is potentially dangerous to processed food businesses too. As scientific monitoring of food improves, there is also the potential for increasing consumer concerns. Well-developed technology would be required to eliminate any contamination following a food safety threat. Innovative management and public relation strategies would be required to resolve any short-term impacts of the situation.

Distribution channels like food service canteens and petrol stations provide opportunities for distribution innovation. They also illustrate the danger of being in only one channel as patterns and places of consumption change rapidly. To efficiently display products to as many people as possible, as often as possible, supply chains may be 'blurred' by creating symbiotic relationships between suppliers and customers. Some suppliers of inputs to CSM maintain storage facilities and control inventories on its sites. The supplier invoices the company for the amount of material used and CSM no longer maintains the infrastructure or accounts for the operational costs related to this processing input.

Critical Success Factors

The focus of innovation across CSM's business portfolio reflects its assessment of the relative business potential in terms of growth and profitability, leveraging qualities and the dynamics of competitive marketplace and consumer trends. CSM does not view innovation as an additional business activity, but an expected outcome of a well run, successful business. The company seeks to create product innovation (successful for consumers) and business innovation (successful for the company). In implementation of innovation CSM considers their timing of marketing is a critical element in competitive innovation and is achieved by effective co-ordinated teamwork focussed on delivering a timely project outcome.

Impact

CSM has achieved aggressive growth and maintained strong financial performance through three broad innovation strategies — growth through acquisitions, smart 'stealing' of successful concepts, and leveraging technology leadership. These strategies have attributed to CSM's positions as number two sugar confectioner in Europe and market leader of bakery ingredients in the US and Canada. In the 1998–99 financial year net turnover was Euro 2.2 billion and 73% of turnover was outside the Netherlands.

Research Collaborators

Australian Ingredient Centre

Centre for Food Technology — Department of Primary Industries, Queensland

CRC for International Food Manufacture and Packaging Science

CSIRO Health Sciences and Nutrition

Dairy Process Engineering Centre

Food Science Australia

Graingene — AWB, GRDC, and CSIRO

Smart Foods Centre — University of Wollongong

Victorian Institute of Horticulture Development

References

- 1 The case studies were identified in consultation with the Department of Agriculture, Fisheries and Forestry - Australia, Food Science Australia and the CSIRO Food Into Asia Program. The information is intended to inform policy review and development in this area.
- 2 Drucker, P.F. 1955, *The Practice of Management*, London: Heinemann, p.55–56. Subsequently republished and re-stated in various editions over the last 45 years.
- 3 *ibid*
- 4 Trott, P. *Innovation Management and New Product Development*, London: Financial Times-Pitman, p.12. This definition draws on a US Department of Commerce analysis.
- 5 *ibid*
- 6 Management theory suggests that there are two main purposes of a business: to create a customer and to continuously innovate.
- 7 Drucker, P. 1999 *Innovation and Entrepreneurship*, p.286. These points are reiterated in a study by William L Miller and Langdon Morris, *Fourth Generation R&D: Managing Knowledge, Technology and Innovation*, Wiley: New York, p. 287 ff.
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- 9 Burns, T & Stalker, G.M. 1994, *The Management of Innovation*, Revised Edition, Oxford: Oxford University Press, p.120–121.
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- 11 Ghoshal, S, Bartlett, C.A & Moran, P. Á 'New manifesto for management', *Sloan Management Review*, 40:3, Spring 1999, p.9–20.
- 12 *ibid*, p. 13
- 13 *ibid*, p. 14

- 14 These factors are identified and analysed at length in John Kay's *The Foundations of Corporate Success* [published in the US as *Why Firms Succeed*]
- 15 Howard Partners appreciates the contribution of Mr Jim Kennedy, Chief Executive, Supermarkets to Asia Limited, in preparing this section.
- 16 Howard Partners is currently looking at this issue by reviewing R&D funding for food companies.
- 17 Since the abolition of processor levies there has been a substantial reduction in the level of funding for innovation in this area.
- 18 Urban, G. L. 1998, 'Strategic Roots of Innovation' in William Dauphinais and Colin Price (eds) *Straight from the CEO*, Nicholas Brierley, New York, p.266–7.
- 19 James Brian Quinn, 'Outsourcing Innovation: The New Engine of Growth', *Sloan Management Review*, Summer 2000, p. 17–18.
- 20 Ganguly, Ashok, *Business Driven Research and Development: Managing Knowledge to Create Wealth*, Macmillan: London, p. 33.
- 21 The ARC has a number of programs that support university-industry interaction. This issue is also addressed at some length by Gener Allen and Rick Jarman in *Collaborative R&D: Manufacturing's New Tool*, Wiley: New York, 1999.
- 22 The Annual Report of the IR&D Board indicates that very few agribusiness and food processing companies receive assistance under the START Program
- 23 Many management programs in universities are oriented towards management in established businesses — with a heavy bias towards large enterprises.

Innovative Food Business

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