

Chapter 4

Case studies

The following case studies are intended to exemplify the contribution that food product innovations can make to the financial well-being of a business. They are also intended to exemplify critical success factors for innovation and the impact that the innovation might have to the particular firm, industry or country.

FLAVOURED FRUIT PIECES²

Cranberries gained popularity when the American navy used them as a good source of vitamin C against scurvy. However, the suppliers had to depend on wild cranberries. Cranberries require unusual soil: a poorly drained, highly acid combination of peat and clay. This type of soil is found where glaciers have scoured the earth. The wild cranberry was eventually tamed by spreading sand over cultivated plants, after it was observed that the biggest and juiciest wild cranberries grew where the wind blew layers of sand over the plants.

Thanks to a series of more and more efficient mechanical harvesters, cranberry production became increasingly automated. Two main process innovations, however, came from studying the natural properties of the fruit. First, good cranberries bounce and float due to internal air pockets. This bounce property is used for the automatic sorting of the fruit.

Cranberry sauce is mostly consumed at Thanksgiving and Christmas. To spread demand for their production capacity Ocean Spray looked for other products to make from cranberries that could be sold all year. Juice was one; however, there was a challenge to get people to buy the product. Ocean Spray focussed on the newness of the drink in bars and on how cranberries can help to cure bladder and other infections. This type of demand-building efforts encouraged people to taste the product; brand-building held them to loyal to Ocean Spray. Dried cranberries were also sold to bakers and cereal producers.

In their search for diversified food products Ocean Spray determined that cranberry hulls, which were normally smashed when juice was made, could be emptied and re-filled with juice from blueberries, mangoes, raspberries or any other juice using the principle of osmosis. Distilled water was forced into the hulls and cranberry juice was removed. The result was a whole, water-filled hull. Next, the process is reversed; the hull is filled with another fruit juice. This gave Ocean Spray their 'flavoured fruit pieces', which are cranberries with the taste of orange, cherry or any other fruit taste. The advantages of this product are that it is durable, with a shelf-life of two years, while keeping a chewy texture when baked, unlike the fruits whose flavours they mimic. Another recent product innovation is gelatine-treated fruit pieces that stay soft and chewy for two years. This is perfect for breakfast cereals.

The dynamic that is relevant in this case is behind many mass-produced goods. Growing demand provides the incentive to create cheaper and more reliable supply. Cheaper and more reliable supply, in turn, creates incentives to find new markets, which requires new products. Success in new markets increases demand again. This helps to maintain growth and profitability.

Lessons

- The ability to conceive an idea for a new product is crucial; creative genius was required to recognise the role that cranberry hulls could play.

² This case study is drawn from an article in The Economist, 28 April 2005.

- Existing technologies were able to be used for the processing, thus reinforcing the importance of the concept for the new product.
- Processing waste can be a valuable source of raw material for new products.
- Ingredients for food products also form an area of business that can benefit from innovations. The flavoured fruit pieces can be used as an ingredient in bakery products or breakfast cereals, for instance.

CASSAVA PROCESSING

Cassava is an important staple food in tropical Africa and is also a cash crop in many African countries. Traditional products, such as *udaga*, *ugali* and *makopa* can be produced relatively cheaply using simple equipment. However, the processing methods are too labour intensive for commercial use and the quality of the flour does not meet market expectations Oirschot *et al.* (2004).

The Lake Zone in Tanzania is poor and many people earn less than US\$1 per day. It was anticipated that a market for cheaper, locally produced cassava flour might exist since approximately 70,000 tonnes of wheat flour were imported each year to the Lake Zone. Many farmers were also interested in cassava processing.

First, manual chippers with equivalent cost to a bicycle (\$100) were assessed and deemed to be appropriate. Farmers received information about the chipping technology via the local research institute. Second, improved product quality was attained when new elevated drying tables were introduced. This replaced the use of canvas sheets placed on the ground, thereby reducing contamination from sand and animals.

In pilot trials, customers in urban markets came back for more the next day. In a rural market it took longer to sell the chips. In one case, the chips were sold to a supermarket that milled them into flour. The branch manager commented that the flour was of good quality because of its white colour.

It was noted that some farmers were restricted by their lack of access to transport to bring the cassava chips to the market. In addition, better results were obtained when farmers were organized in groups.

Lessons

- In the context of The Lake Zone, it seemed to be useful to start being innovative with processed foods that were similar to the products the people are familiar with. Customers at urban markets are more likely to buy new products than customers at rural markets.
- Transport can be a problem when markets need to be reached.
- Simple processing techniques can be the basis for incremental change innovations.

MILK FOR LACTOSE-INTOLERANT³

Valio (*best* in Finnish) is Finland's biggest dairy company. The company seeks to develop innovative products for consumers who are interested in food that increases health and well-being. For instance, Valio has acquired the global commercial rights to the bacterium *Lactobacillus GG* (LGGTM). Now, the company has licensed dairy products containing LGG to markets in more than 25 countries and this is seen as an innovative procedure in the industry [Tetra Pak, 2004].

Between 15 and 20 percent of the Finnish population is lactose intolerant. In Mediterranean countries the proportion is closer to 50 percent, while in parts of Asia the entire populations are lactose intolerant. Individuals who are lactose intolerant find that their stomachs do not accept any milk, so most of them have stopped drinking milk.

³ This case study is drawn from Tetra Pak, 2004

Today, Valio produces and sells more than 100 different products that are lactose-reduced dairy products. However, Fins have never liked the sweet-tasting low-lactose milk.

The challenge to Valio was to produce milk that could be tolerated by the lactose intolerant, but which was also acceptable in terms of taste. After a long period of research and development, Valio was able to perfect a unique process to produce lactose-free milk (< 0.01 percent) that tasted just as milk should. They use, among things, chromatographic separation.

At first, Valio was not allowed to call the product ‘milk’, as one of its natural constituents had been removed. Finally, it was launched as ‘light milk drink’. Even though the price is twice as high as normal milk, consumers were not deterred. The desire for milk among lactose intolerant was obviously far higher than expected. In 2004, sales of 40 million litres were expected. The milk was to be supplemented by a fat-free version in 2004 [Tetra Pak, 2004].

Lessons

- The case underlines the importance of taste preferences. Lactose-free milk with a sweet taste was not appreciated in Finland and therefore it was unsuccessful. Consumers were willing to pay a price premium for a unique product that met their needs.
- Processing innovations may be required to develop a new food product. In which case investment in research and development was necessary.

NEW ZEALAND KIWIFRUIT INDUSTRY⁴

The following timeline shows the evolution of the industry and the innovations that supported its growth and development.

TABLE 3

Date	Happening	Comment
1904	In 1903, Isabel Fraser, a school headmistress in New Zealand, sailed for Japan. In Japan, Isabel met her sister Katie, and the pair left for the mission in Yichang, China a month later. (Ichang or Yichang as it is now known, lies on the northern bank of the Yangtze River about 1600km upstream from Shanghai.) Isabel returned to New Zealand in January 1904, bringing with her the seeds of the Ichang gooseberry.	Recognition of a fruit that might be of interest to consumers and hence growers.
1910	Then called "Chinese gooseberries" New Zealand's first kiwifruit vines were recorded as bearing fruit on Alexander Allison's property, south of Wanganui.	
1920	Chinese gooseberry plants were offered for sale by a number of nurserymen, including Duncan and Davies, Bruno Just, Hortons of Hastings, Frank Mason and Hayward Wright. Plantings were recorded in Auckland, Fielding, Wanganui and Tauranga.	Private sector recognises commercial potential of the fruit.
1924	Auckland nurseryman Hayward Wright developed the green-fleshed kiwifruit variety that bears his name and has become the most commonly grown around the world.	Investment in product improvement (although the absence of plant variety rights at the time precluded Mr Hayward from reaping significant rewards from his development).
1934	Jim MacLoughlin planted his first seven acres of Chinese Gooseberries on his property in the Bay of Plenty region	Investment in commercial production for domestic consumption.
1952	Jim MacLoughlin and Graham Bayliss exported the first commercial shipment, 13 tonnes of Chinese Gooseberries to England	First efforts at export.
1959	Auckland-based fruit packers Turners and Growers briefly named the fruit "melonette," but changed it to the Maori word "kiwi" when they learned of import tariffs applied to melons.	A new market is tried.

⁴ This case study developed on the basis of information presented at http://www.zesprikiwi.com/history_flash.htm

	The first 100 cases of New Zealand-grown kiwifruit arrived in San Francisco, California.	
1962	Frieda Caplan of Frieda's Inc. and The Oppenheimer Group began developing markets for kiwifruit in the US and Canada.	Partners investing in market development.
1964	Harry and David's Fruit of the Month Club featured a special offer on "kiwi berries." The catalogue warned, "You had better order now; they are scarcer than screen doors on submarines."	Partners investing in market development.
1970	The first successful California kiwifruit crop was harvested. Kiwifruit became a global culinary craze as the signature garnish of nouvelle cuisine.	But now there is competition from US growers.
1977	The New Zealand Kiwifruit Marketing Licensing Authority was created. This organization developed to be a single desk operational and marketing organization, the New Zealand Kiwifruit Marketing Board (NZKMB), in 1988.	Significant investment in market development and R&D to develop improved post-harvest systems to assure fruit quality. As market demand grew, the area planted in kiwifruit grew in NZ and countries such as Chile, Italy and USA. Prices declined over time.
1991	Taste testing took place on an intriguing new gold kiwifruit variety -- then called "Hort16A," the new variety was naturally bred from a vine at the HortResearch orchard in Te Puke. The taste and flesh colour were unique and appealing; rapid multiplication of the single vine was requested for further evaluation.	Investment in R&D produces a new product that, this time, can be protected by plant variety rights. The industry now has a potential new product for the market.
1992	Bio-Gro certified organic kiwifruit was exported by the NZKMB for the first time. The first pack house dedicated solely to handling organic kiwifruit was established in 1994.	Investment in developing growing and handling systems to meet Bio-Gro requirements creates the ability to compete in a niche market.
1997	The NZKMB created the "Zespri" brand name for New Zealand kiwifruit and established "ZESPRI International Ltd." as its marketing subsidiary.	Investment in developing a brand for the NZ fruit to improve competitiveness.
1999	ZESPRI International introduced the tropical-sweet, yellow-fleshed ZESPRI™ GOLD Kiwifruit variety to the world and re-branded Hayward fruit as ZESPRI™ GREEN Kiwifruit	Further investment in product development for the gold kiwifruit refined the product and built knowledge on post-harvest handling. Significant investment in market development followed to establish the product.

Lessons

The case shows how an industry can grow, slowly at first, and then boom when market demand increases rapidly. The key lessons are:

- to introduce a new fruit to a market requires significant investment and the ability to align the product to market needs. In the case of kiwifruit, the nouvelle cuisine practiced by leading chefs represented a market opening for an exotic fruit that could garnish desserts. Broader domestic consumption followed once consumers were aware of the fruit through restaurant dining and use of the fruit was explained in cuisine magazines.
- Success attracts imitators who, in this case, could initially access the plant material because of a lack of intellectual property rights.
- The NZ kiwifruit industry experienced declining returns when competitors entered markets it had developed. The response was to invest in new product development.
- The presence of plant variety rights (intellectual property rights) enabled the industry to realise a return on the investment in R&D.
- New product development for horticultural crops not only requires new or improved crops, it also requires development of post-harvest systems to assure quality and development of market demand for the new fruit or vegetable.