

7

Case studies: product development in the food system

The four basic stages in the PD Process are the same for all food product development, but there are significant differences in the activities, techniques and timings for new product development in the primary production, industrial food processing, and food manufacturing industries.

Primary production's product development is based on either a breeding process from cultivated varieties or capturing a new species from the wild. The development of new plants, animals and fish takes a great deal of time and depends on times of growing and harvesting. There can be a general product concept based on perceived consumer or industrial wants and needs, and on technical knowledge to identify the possible parents for the new varieties. But it takes generations to develop the suitable variants. This is described in the first Case Study on starting a new apple variety. The industrial ambience is of a farmers' cooperative fruit processing and exporting enterprise working with a national horticultural research institution. The second Case Study looks at another fresh fruit project, on mangoes. This time the emphasis is strongly on the consumer, using statistical and other quantitative techniques to build up the consumers' preference image, and then to use this consumer image and information in assessing current varieties, and moving towards improvements. This is in the framework of government/university research, a national growers' organisation and private exporters and marketers.

Industrial food processing's product development is very strongly processing-based, both in the ingredient supplying and the buying companies. Food manufacture is usually directed towards providing a wide variety of products for consumers, which is continually changing. There are major differences between the activities in the PD Process for industrial and consumer products, as shown in Fig. 7.1.

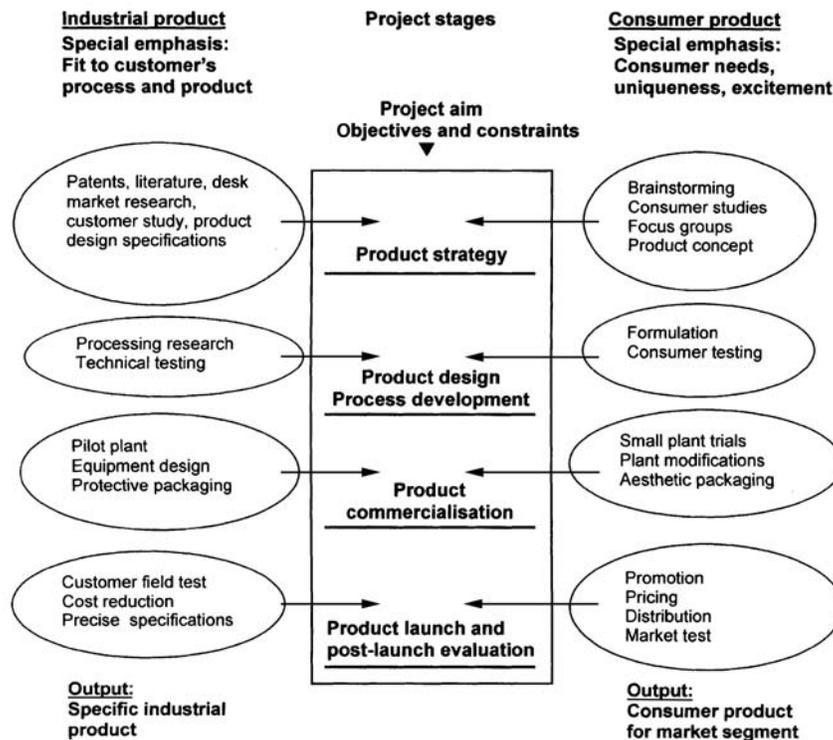


Fig. 7.1 PD activities for consumer and industrial products (From Earle and Earle, *Building the Future on New Products*, © LFRA Ltd, 2000, by permission of Leatherhead Food RA, Leatherhead, UK).

The industrial product, a food ingredient, is usually developed in collaboration with the processors or manufacturers who are going to use the ingredient in the production of their product. These companies may provide the product design specifications or may indicate some of the qualities they need; therefore the PD Process is highly concentrated on process development and the customer does the field-testing. This is illustrated in the third Case Study in which development of an ingredient, a whey protein isolate, sophisticated both in its processing and in its market, is described. Research is carried out by an industry-wide research institute working with a university and a large farmers' cooperative dairy company and dairy marketing organisation.

The fourth Case Study is the development of a consumer product, a new variety of sauces. The development was to establish a new product platform with a number of individual lines, in a large factory unit of a multinational food manufacturing company, and to sell these sauces initially locally, and then for export to major international markets. This product development was totally private enterprise.

In studying these case studies, differences in activities in the four stages of the PD Process can be seen, caused by:

- markets for which the products are designed;
- technology available and used;
- time taken for product development;
- costs of product development;
- priorities set by the various parts of the food system.

The Case Studies cannot be taken as typical of PD Processes because each has its own special features, but they do illustrate generic features.

7.1 Primary production: creating a new apple variety

Why does a consumer choose a particular apple and buy it, or indeed choose an apple at all rather than a pear or a plum? Maybe because it looks bright and attractive, maybe because it looks fresh and crisp, it is available or cheap, or it looks much the same as it always has and earlier experience was favourable. Or maybe because, over and above lots of positive attributes, it is novel and cries out to be tried. And then having bought it, if eating impressions are favourable and it is indeed appealing in taste, flavour and crispness, then the favourable image is retained and it is the variety that goes on being bought especially if the apple is distinctive. So in the striving and seeking to secure and gain market share there is a great potential premium from a desirable new variety.

7.1.1 Product development for a new apple

The area for product development was first identified and then the possible parents chosen. In the next generation, there were many variations, screened on technical analysis of:

- product qualities such as sensory characteristics, nutritional value, composition, use, safety;
- production qualities such as production difficulties/ease, disease resistance, yields;
- handling qualities such as deterioration after harvesting and on storage.

The cultivars in the first generation were screened, and the most suitable for further development chosen for growing in the next season. This further generation grown in the next season was again screened. This time, not only was there technical screening but also the production and marketing experts selected for suitability for production and marketing. This growing and screening took several generations and significant time, in the order of years. On reduction to a few selections, the qualities were related to the market conditions at that time. While senior people in the company made the final selections, they were assisted and guided by consumers and distribution/retail customers who evaluated the new fresh products. Production was started, multiplied with commercial growers/farmers and then the first crop test marketed on a small scale.

Creating a new and successful horticultural variety is a long search through genetic possibility, inheritance, disease resistance, keeping quality, followed by the trade-offs of one attribute with another; and so all of these aspects had to be gone through. This went on over many generations of seedlings which, after the final selection was narrowed right down, has then to grow to trees and bear and proliferate. So the exercise was very much one of seeking to establish just what it is that the target consumers ask from their ideal apple, and then trying to match this against what nature, aided by the skill of the plant breeder, will allow. All this took 15 years or so, making it an especially long-term undertaking. It is also an expensive one in that beyond the visible costs is the inevitability that money risked and spent now can receive no return for all those years. As a project this injects its own special features, while at the same time all the standard routines are still just as necessary as in any other development of a new product.

New Zealand for many years had a 'single desk' exporter and marketer of bulk apples working cooperatively for all of the apple growers. The Horticulture and Food Research Institute of New Zealand Ltd (Box 7.1) carried out its variety development and licensed ENZA as a company to market its varieties.

Box 7.1 Horticulture and Food Research Institute (HortResearch)

HortResearch is extensively involved in developing new plant varieties. We have expert breeding capability in a range of fruiting, ornamental, and agro-forestry crops. Our plant breeders work with industry in order to develop new varieties and rootstocks to provide cultural or market advantages for growers. These activities are backed by extensive in-house scientific capability in sensory science, genetics and plant physiology to assist in making selections to suit the environments, end uses and tastes of different cultural groups both within New Zealand and around the world.

The fruit breeding programmes aim for variety, flavour, texture, storage life, appearance, productivity, pest and disease resistance and climatic adaptation.

HortResearch is a world leader in apple cultivar development. Examples of our success are the Pacific apple series ('Pacific Rose', 'Pacific Beauty', and 'Pacific Queen') marketed by ENZAFRUIT. This new variety development is also well supported by technical back up in orchard production, integrated pest management, postharvest handling and associated capabilities within HortResearch.

Source: Adapted from a publicity letter from Dr Ian Warrington, CEO, HortResearch.

Table 7.1 Timetable for the development of Pacific Rose apples

1st cycle (product strategy)		
6 months	Discussion from 'Pacific' markets of need for blush apples	
	Grown in glasshouses	20,000 seedlings
18 months	Expert selection	
	Grown in open ground Selected on resistance to 'blackspot' and 'powdery mildew'	8000 seedlings
2nd cycle (product design and process development)		
4 years	Grown in fruit selection orchards	5000 seedlings
	Selected on fruit characteristics Grown on two sites	100–200 seedlings
2 years	Selected by plant breeders, pomologists, on fruit and growing characteristics Judged for market suitability	10 seedlings
3rd cycle (product commercialisation and product launch)		
2 years	Growing expanded	1 variety selected
1993	Seedlings distributed to growers	1000 cartons
1994	Pomology developed, storage trials	5000 cartons
1995	Multiplied by commercial breeders/growers	22,000 cartons
1996	Commercial production	104,000 cartons

The stages and approximate timing of the development of Pacific Rose are shown in Table 7.1. This indicates the very extended time scale, arising from the intervals necessary for the seedlings of each successive generation to grow so that their fruit can be evaluated.

Plant breeders normally talk about development cycles and these have been arbitrarily related to the PD Process. Because of the nature of developing apples there is not an exact date for launch, but the market is expanded in a rolling launch as the fruit becomes available.

7.1.2 Stage 1: Product strategy

Management decided that the existing varieties had been on the market for long enough, and to provide an edge and a stimulus a new variety was needed. To some extent this is a continuing search. But it gained added stimulus as the older varieties were a bit stale, and market share would surely dwindle as the competition sought to kindle its own novelties. Apart from the very broad concept, a new apple, plant breeders thought back over the whole gamut of experience with apple varieties. They tried to single out characteristics that

might be applied usefully to build a new creation. This was reinforced by market insights such as possible gaps in present offerings, fashions as revealed by sales trends, problems exhibited by present varieties, competitors' activities, and so on. They did not know exactly what was wanted but formulated a group of attributes, built on a range of good qualities, and sought to assess these and maximise them by selection from trial seedlings of defined types (cultivars).

For example appearance is a major purchase determinant, and so a target colour and configuration were selected. In this case it was decided that the new apple should be a 'blush' apple, one in which red and yellow colorations shade into one another rather than uniform colour or stripes. Decisions were taken of targets for sweetness, acidity, and acid/sugar ratio, flavour, fruit shape, texture and crispness. Added are those properties that are central concerns to the growers and handlers such as: disease resistance, yield and size consistency, and keeping and storage qualities, and these must be optimised for all apples. A major consideration was the time scale, commitment to perhaps 10–15 years of work overall to build a new variety to commercial market success.

7.1.3 Stage 2: Product design and process development

The first cycle of selection was rapid screening of seedlings, from about 20,000 in glasshouses (six months) reduced to 8000 in the open ground nursery through selection for resistance to blackspot disease (18 months).

In the second cycle, about 5000 per year, after selection for resistance to powdery mildew, were planted out in the fruit selection orchards (4 years). About 2% were selected for fruit characteristics and these were then carried forward to the next cycle. A selection index was set up, and made into a scoring regime. The various desirable attributes were first established and then scored by members of the team as illustrated in Table 7.2, generally on a scale of one to ten, with ten being most desirable. Table 7.2 shows the scores for one apple cultivar. All those cultivars with an 'overall quality rating' less than seven, when aggregated and averaged, were discarded.

In this particular case, the designation moved from a concept, to a tree number, to the final name Pacific Rose (technically the variety name was Sciros, marketed as Pacific Rose). The particular chosen characteristic factors, plus the desirable and more general factors, were pursued through all the generations and the selections. Some of these factors had sometimes, and regrettably, to be traded off to a degree as the selections evolved. To cope with such problems value hierarchies were established, and used to guide selection, and reviewed from time to time.

7.1.4 Stage 3: Product commercialisation

As well as consumer and grower characteristics, consideration had also to be given to vital genetic aspects. These included factors such as the heritability of selected attributes such as mildew resistance, because at some stage large

Table 7.2 BreedBase Report

Family	A040	Seedling R04T119
Crop type	<i>Apple</i>	
Fruit shape	<i>Flat</i>	
Colour		
Background colour	<i>Yellow</i>	
Overcolour	<i>Red</i>	
% Overcolour	0% _____ 3 _____	100%
Colour pattern	<i>Stripe</i>	
Colour intensity	Light _____ 2 _____	Heavy
Lenticel:	Inconspicuous _____ 3 _____	Very Conspicuous
Flesh		
Flesh colour	<i>Cream</i>	
Flesh firmness	Soft _____ 7 _____	Hard
Flesh crispness	None _____ 7 _____	Very
Flesh grittiness	Soft 0 _____	Hard
Flesh flavour		
Juicy	Dry _____ 8 _____	Very juicy
Sweetness	Nil _____ 5 _____	High
Sourness	Nil _____ 5 _____	High
Aroma	Delicate _____ 5 _____	Rich
Astringency	Nil 0 _____	High
Bitterness	Nil 0 _____	High
Skin		
Skin thickness	Thin _____ 5 _____	Thick
Skin greasiness	Dry _____ 2 _____	Greasy
Skin texture	Non-chewy _____ 4 _____	Chewy
Skin flavour	_____	
	<i>Not significant</i>	
Harvest Date	12/3/96	
Storage Days	107	
Weight	176 g	
Maturity	OK	
Eating Quality	Very good	
Attractiveness	Poor _____ 7 _____	Very good
Overall quality	Very good	
Comments		

Note: The numbers and comments inserted represent assessment of a particular seedling.
Source: From HortResearch, Goddard Lane, Havelock North, New Zealand.

numbers of plants will have to be propagated from the successful selection and then established and grown in orchards. Although the key participants were the plant breeders, it was thought to be very important that the scoring be done by a wider-based group. For practical reasons in the initial stages it tended to be a laboratory team but as soon as the earliest stages were completed a wider group was used. The work was monotonous and repetitive so that team numbers are limited but, by their working to a standard scoring system, numbers of selected candidates were reduced to the order of one hundred.

For the Pacific Rose, these selections were then grown in duplicate on two sites and the product apples held 100 days at 0 °C in a cool store and for 7 days at ambient temperatures, to observe storage characteristics. Meetings were held, bringing in other fruit scientists and ENZA staff to widen the vision, and including fruitgrowers and supermarket operators to seek feedback, but still on a largely local basis.

Then in the third cycle the best 10 out of 200 were selected for consumer trials and finally characteristic clusters were assembled where 75% or more of the panel opted for a particular attribute, such as acidity combined with sweetness.

Finally, one variety was chosen by senior management for launching. Trials were then run with selected supermarkets, taking about a thousand cases and trying the market (3–5 years). Pomology work was accelerated, assessing the required optimum growing environment and the hazards. Another important consideration at this stage was naming. The final choice, after a good deal of investigating and agonising, was Pacific Rose. This name seemed to have very many positive overtones and manageable problems. (After its endorsement by the market, it became the forerunner of a 'Pacific' platform of similar apples as the general name and style were clearly found to be very attractive and distinctive.)

During the last two years or so of the commercialisation phase, as well as being checked out locally, small parcels of fruit were dispatched on a trial basis to agents overseas. ENZA has main agents in the UK, Belgium for the rest of Europe, the USA, and in Singapore for the Asian market. These were used for distribution, and also for market intelligence and feedback. The message from these people was very positive. In fact from the marketing viewpoint it was somewhat too positive and was too widely disseminated. This generated an enthusiasm among growers in particular, which stimulated plantings. So in time production threatened to flood the local market and in turn to push the overseas market beyond its powers of initial absorption.

7.1.5 Stage 4: Product launch and evaluation

Finally the trees of the selected variety were multiplied to the extent that commercial growers could enter into production of the quantities needed for initially the launch, and then be ready for the full-scale farming, of a successful new variety. Commercial quantities of the new apples were dispatched to the overseas agents. They in turn fed them to wholesalers and retailers, initially

Table 7.3 Production of Pacific Rose apples (thousands of 10 kg cartons)

1992	1993	1994	1995	1996	1997	1998	1999	2000
0	1	5	22	104	120	173	353	950

selected as those, and in those areas, likely to be most receptive. It was commented that little direct consumer testing was carried out, as results from sample trials correlated highly with agents' opinions which were quicker and cheaper to obtain. The apples were then sent to the trade buyers in retail markets and supermarkets.

The first great hurdle was to get them on the supermarket shelves: once on, customer demonstration and tastings intensified their visibility. It was found that the most receptive area was Asia, the next North America, with the UK a little less enthusiastic. The rest of Europe tailed with comments seeking more consistent fruit quality and more flavour. The customer balance settled to about 40% Asia, 30% North America, and of the remainder most to the UK. The quite dramatic build up of production of Pacific Rose apples is shown in Table 7.3. This also indicates the pressures that arose to move such rapidly increasing quantities through the markets.

It was important to seek to safeguard, as far as possible, the commercial aspects of the development. So plant protection rights were sought for the variety. This essentially was so that the considerable costs of the development could be recouped and also reasonable returns made on the investments of resources and time. It became evident that this protection was significant. Even lawsuits and cloak-and-dagger stuff followed, with some overseas competitors seeking to cash in, unauthorised and without paying, on an obvious success.

It was evident early on that in order to maximise the returns it would be desirable to have overall control of production and marketing. Enthusiasm had brought large early production, with risks of drowning the market and on occasion prices had to be shaded to clear fruit. In hindsight this served to spread and deepen overall consumption, but at the time it looked like expensive advertising if not just losses. Closer matching of production to market would also have allowed more time for the details of growing the variety, with attention to fruit quality and consistency, those prime demands of good supermarket operators. The balance of production and demand is the great intransigent imponderable of all agriculture, and the build-up of supply of Pacific Rose created supply pressures which later variety releases will seek to reduce by closer control of the growing of new varieties.

Another interesting further extension of the development was to seek out, license and harmonise with selected overseas growers, particularly ones who could produce to complement New Zealand production. For example, by spreading some of the growing to the Northern Hemisphere, year-round production was organised so as to even-out supply to satisfy and sustain customer demand.

Later, feedback from the markets was used as a base for the breeding of further members of the variety, and so to build the offering and the acceptance and the sales over an extended platform of similar, but distinguishable, apples. The platform name, 'Pacific' was retained, moving to 'Pacific Queen' and 'Pacific Beauty' to differentiate newcomers as they appeared.

Domestic sales were built up simultaneously, but though important they were only part of the overall business of the industry. They could also be used as a vehicle for sizes, shapes and configurations less attractive to the main line demand which could therefore be selective of premium fruit. So a national and international market was established which became considerable and satisfactory.

This example illustrates how a substantially long-term development of a product with particular problems, those of setting up and evaluating a new horticultural variety, still follows the general principles of product development. One of the problems in developing new plant products for the consumer market is the input of the consumers. At one time the marketing people and the breeders decided that they knew what the market wanted and therefore all testing up to the small test market was done by them or other people in the research station and the company. In recent years, great efforts have been made to bring the consumers in earlier. Obviously they cannot test the many hundreds of samples, but they can determine the concept for the new product. Therefore it is to them that the greatest effort is directed, trying to understand as precisely as possible what it is that they might want from a variety which still has to be produced. Then there is the slow process of selecting and building up fruit, recalling the time consumed between selecting and actually growing the next generation of apple.

Think break

1. Consumers determine market success— reflect on this statement, its accuracy and its implications for fresh fruit product development.
2. Consider carefully and weigh the relative advantages and disadvantages of using available local and expert opinion, contrasted with randomised consumer research, in exploring the required eating characteristics, flavour and appearance in the PD Process for fresh fruit.
3. This study is of a very long-term exercise for a corporate entity, with increasingly limited product flexibility as the development progresses. What are the implications of this for product development management, organisation and operation?
4. How important do you think metrication is as a determinant in decision making in the PD Process? Therefore, because metrication is often difficult, and sometimes very difficult, how much management and technical effort should be devoted to it relative to the exercise of less formal and more qualitative judgement? Short term for a product? Long term for an organisation?

7.2 Development of Thai mango products and their competitive advantage in export markets

Mangoes are an attractive traditional fruit produced in quantity in Thailand. Many Thai varieties have been produced, and from time to time overseas varieties have been grown. In addition to the major local market, quite a substantial export trade has grown up which is of economic importance to the country. The export trade had grown up somewhat arbitrarily. So a clear opportunity was perceived to look more systematically at what was available, and to seek, using quantitative techniques, to describe and determine those varieties that were most attractive to overseas customers, so that overseas sales could be further expanded and marketing improved. It was product development through systematic selection and improvement, with particular reference to consumers and their preferences.

Planning of the development was a collaborative undertaking between the Thai Departments of Agriculture and Agriculture Extension, researchers at Khon Kaen and Kasetsart Universities, and large mango growers and exporters. After discussion, the main brief for the study was determined as:

- select the most suitable ripe and fresh varieties for export to three markets, Japan, China, and the Middle East;
- find the best potential distribution channels; and
- develop suitable brand names for the selected varieties.

This was to be based on consumer preference studies, and also supported by characterisation of the chemical properties such as aroma and volatility, and physical properties such as shape, and stone size and distribution, which would be correlated with the consumer preferences. The outcome would then provide information on the relationships between customers' preferences and measurable attributes of the fruit, which could be used by growers, plant selectors and breeders, and exporters and marketers, to develop the Thai mango export industry.

7.2.1 Study design and development

Both to handle such a substantial project and to distribute tasks to appropriate people, the study was divided into ten activities. Each activity was allocated to a group of researchers, though some members were common to several groups. They worked in appropriate localities, laboratories and departments, and under the overall guidance of the Mango Project Leader. The activities are listed in Table 7.4.

Five varieties of Thai mangoes, major ones being commercially grown, were studied, along with two introduced varieties. Using the same batches of mangoes, tests were carried out on the chemical properties, physical properties, aroma volatiles and consumer preferences, correlating these with the measured properties. These in effect combined into one aspect of the case study. Another

Table 7.4 Mango product development study workgroups

1. Mango variety and industry survey
2. Physical properties – size/shape/colour
3. Chemical analysis – constituents/ripening
4. Chemical properties – analysis and flavour
5. Quantitative descriptive analysis – relationships of sensory attributes
6. Consumer preferences – shape/colour/texture/flavour
7. Consumer preferences – correlation with sensory/analytical
8. Consumer preferences – national likes/dislikes
9. Commercial – target markets/channels/distribution
10. Marketing descriptions – brand names/slogans/labelling

separate aspect looked at the best brand name and attribute descriptions, for commercial and marketing purposes. Consumers studied were from Thailand, Japan, China, Hong Kong and the Middle East.

For various practical reasons, principally availability of suitable subjects and materials, the numbers of consumers testing varied in different parts of the tests. There was always account taken of the statistical basis and needs of the study, and the results were statistically assessed to justify the conclusions.

7.2.2 Study implementation

Selection of varieties

To start the study, a group gathered information on the varieties of mangoes that were produced in Thailand and also overseas. These were then carefully considered with respect to usage, production technologies, transportation and storage durability, and eating characteristics. The available literature was inspected, and mango growers and the trade were canvassed to gain requisite information so that the group could select the most promising varieties, those most likely to form the basis of a viable and growing industry, for further investigation in detail.

Physical properties of the fruit

One group looked at physical properties which were fruit weight, fruit size, seed size, seed weight and thickness, skin and flesh weight and thickness, skin and flesh colour, and flesh texture.

Chemical analysis

Another group looked at chemical contents and measured moisture, total soluble solids, acidity, sugar, beta-carotene (vitamin A). Also the sugar/acid ratios were noted.

Chemistry of flavours

Flavour constituents were measured including sugars, acids and aroma volatiles. For example, they showed the extent, as the fruit ripened, of the decline in the

sucrose content and the increase in fructose and glucose. Succinic acid was the most prominent acid, while malic and citric acids were also important; individual contents of these acids varied and could be used as indicators of varieties. Aroma volatiles were measured by gas chromatography. Detailed contents were explored, and the total volatile contents were found to vary with varieties.

Consumer preferences

Consumer preferences to determine the degree of liking on a nine-point hedonic (liking) scale, were carried out in a central location test, on varieties of Thai mangoes using Chinese, Hong Kong, Japanese, Middle East and Thai consumers, settled in Thailand. The objective was to select the best Thai mango for export, based on the sensory characteristics most preferred by the target consumers. The sensory characteristics used, for the fruit and the flesh of the mangoes, were skin colour, fruit size, flesh texture and overall liking for the flesh. Overall the results showed that the fruit shape, fruit aroma and skin appearance were more highly correlated with overall liking than the other attributes. A single variety emerged as the preferred one overall, though to some extent rankings of mangoes varied with the attributes.

National preferences

The degree of liking and disliking for sensory characteristics of the ripe fruit and the flesh of two varieties of the mangoes were explored with about 600 Chinese and 400 Japanese tourists in Thailand. Attributes such as skin appearance, fruit colour, fruit size and shape, flesh colour and flavour, and fruit aroma were covered, as well as overall liking; using hedonic scales. From this emerged attribute profiles for the varieties, and one variety preferred by both groups.

Systematic attribute relationship analysis

A systematic comparative technique known as quantitative descriptive analysis (QDA) was employed by another group to look at six of the mango varieties and to build associations between the sensory attributes of the varieties. The results indicated that the difference among fully ripe mangoes was most pronounced on the perception of fruit size, weight, thickness and fruit aroma strength. This showed, for example, that the variety that was emerging as the preferred one was the smoothest, juiciest and most tender, but not the biggest, heaviest or thickest, nor did it have the heaviest fruit odour.

Conclusions about the fruit

Overall from these experimental results a variety emerged which on balance was preferred by the majority of consumers from each of the countries sampled. The preferred variety, both fruit and flesh, was the Num Dok Mai See Thong mango, followed by Rad and Ma Ha Cha Nok. Additionally, and importantly, this choice was for reasons that could be differentiated and substantiated. The sensory results were supported by extensive information on the fruit, the flesh and the

association of desired mango attributes. The study results therefore provided clear signals statistically based on consumer responses. The signals were to the growers for plant selection and cultivation, to the trade for technical details in handling, storage and exporting, and to the plant breeders for selection of characteristics on which to concentrate and for further experimentation.

7.2.3 Commercial aspects

Brand image

A strong brand name and image is commercially powerful, so one group was given the task of carrying out consumer research that would enable these to be created most effectively in the target markets. Brand names and brand concepts on the fresh fruits in the market were collected from the literature, from the trade by interviewing experts and exporters, from market observation, and from group brainstorming. The brand concepts so obtained were then used to develop questionnaires for the field survey. The design of artworks, building selected brand names into logos, brand stickers and label materials for packages, was then explored by a group of experts, and referred to the orchardists and exporters. The survey showed that significant attitudes included health, nutritive value, colour, convenience of buying, texture, ease of preparation and of course price. The brand investigation showed that the sensory characteristics concerned with the fruit were the most significant, followed by aspects concerned with the consumer such as nutrition and price and prestige. Box 7.2 indicates the general conclusions that arose from consideration of the brand name image. From this work the preferred brand name that emerged was ThaiMango, and the selected slogans 'Your Fresh Taste' and 'The Fresh Taste'.

Market channels

Another group investigated distribution channels. Their interest took in the target markets:

- potential physical distribution channels;
- patterns of marketing of mangoes;
- volumes and values of these products; and
- potential market channels and the role of fresh mangoes.

Information came from documents, opinions of exporters and mail surveys of importers. Patterns of distribution and delivery investigated included land, sea and air transport. Channels of sales to agents, to trading companies, to institutions, to retailers such as supermarkets, convenience stores and fresh markets, to domestic consumers and to institutions were all investigated. Finally management and financing alternatives, such as joint venture companies, were identified. These patterns of trade often differ from one country to another, and so it was necessary to look in detail at these in each of the countries. Government regulations were very important. Applicable regulations took many forms and included inspection, treatment and certification measures, and also

Box 7.2 Mango brand name research conclusions

The results from a literature review, and observing both local and overseas commercial fruit brands, showed that the important concepts of creating brand name are the source of fruit, good quality, good taste, freshness, nutritious properties and relation to the environment. From interviewing Thai managers and exporters, the important concepts of creating brand name should be merit (goodness), scale, enterprise or company name, and levels of quality.

Experts said that ‘no one has created a brand name which is unique and relates to the mango. Most brands have been created for remembering, without adequate concern for the mango characteristics. However brand names may or may not be necessary because they also depend on the selling system.’

Marketing experts suggested that the brand name should be easy to pronounce and remember, the brand mark should be a Thai-identified symbol, and the slogan should relate to buying decision factors.

Attitudes to mango and buying decision factors of Chinese, Japanese and Middle East tourists were surveyed. The results showed that they think of mango in the following ways:

- Mango consumption is good for health
- Mango is nutritious
- Mango is suitable to consume at anytime
- Mango is suitable for everyone
- Mango is available at all times
- Mango is suitable for consumption in every season
- Mango consumption indicates good taste
- Mango is a worthwhile gift

Positive buying decision factors included: without toxic substances, smell of the fruit, taste, colour of the fruit, price, convenience to buy, texture, nutrition, ease of consumption, and availability at anytime.

Source: From Ngarmsak, 2000.

fiscal rules such as entry taxes and tariffs which were generally specific to each country.

7.2.4 Launch

The equivalent of the launch for this case study was a combination: of presentations of results and conclusions, of publicity, and of consequent action by officials and by the various elements of the mango trade.

The first presentation was to the Mango Round Table, on which were experts from the Thai Departments of Agriculture and Agriculture Extension, from Kasetsart University, from large mango orchard owners, and from exporters. After the presentation, and based on the results of the study, the Mango Round Table made the selection of two varieties for the top markets, and allowed one other variety with selected grades only. Subsequently the work was presented to the public, including media and other exporters and orchardists, and it led also to the formation of the Mango Growing Association of Thailand. Other meetings were called, at which planning was started for extension of the areas of production and for continuation of the research. So this product development has injected a new dimension into the mango export programme for Thailand.

Think break

1. Many product development programmes are conducted, sometimes with successful outcomes, using little or no consumer research. They rely instead on historical data and expertise and experts, to provide market predictions. Review the case for and against this approach.
2. One of the problems in consumer research for the food industry is to secure a true 'population' sample. In this case some use was made of expatriates and tourists rather than home residents for the sampling. To what extent might this make the results skewed in some way and less valid?
3. Producers of raw materials, and in particular agricultural raw materials, have some special difficulties with new product development. To what extent do you feel that their needs can be fitted by a standardised PD Process, and to what extent might it be better for them either to have a standard process of their own, or to set up *ad hoc* processes with each particular situation?
4. This and many other consumer surveys reveal cultural differences, which should be taken into account in the PD Process as they may influence the success of the outcomes. Reflect on whether cultural differences should, or need to, influence the management of product development, and if so in what aspects?

7.3 Industrial products: PD Process and management for whey proteins

The New Zealand dairy industry is basically a farmers' cooperative. Within it there are dairy companies which process the milk, and they are represented on the NZ Dairy Board which markets the dairy products worldwide. There are several subsidiaries but two important marketing companies are New Zealand Milk Ltd and Whey Products New Zealand Ltd. The latter is responsible for marketing milk proteins as industrial products. There are several industrial milk protein categories, for example, caseins and whey proteins; these are divided into further categories according to their properties and also their uses.

Traditionally whey is the liquid remaining when curd for cheese making has been strained off, taking a proportion of the milk proteins. It contains a number of useful constituents including lactose or milk sugar, a little fat and the whey proteins, together with nearly 20 times their weight of water. In manufacture of whey powder, both the lactose and the water can be separated from the proteins. Because the proteins are not a single entity they themselves can be fractionated. So, specific protein fractions can result, each with special characteristics. These specific fractions can be characterised in terms of physical, chemical, functional and nutritional properties that offer the potential for new food products (Huffman, 1996).

Product development, in this case, lies in the scope for both designing the processing, which can include separation of protein fractions and other manipulation, and in finding worthwhile markets. Thus the product concept is essentially technologically defined as technical product characteristics and processing capability. The first of these uses the knowledge that whey proteins have been shown by research to be nutritionally important and desirable in the human diet, and the second the capacity to produce in quantity a range of these proteins to a close functionality specification. These protein products have then to be tailored in the PD Process to meet the needs of a market, which is identified and explored.

The main development group was the New Zealand Dairy Research Institute at Palmerston North, which also has overseas laboratories including one in California, and which is a substantial research and development unit of the NZ Dairy Board. To supplement their technical resources and skills, they worked with Massey University through the Food Technology Research Centre on technology, including product evaluation and model testing, and through the Chemistry Department on ion exchange resins. They cooperated with regional companies of the NZ Dairy Board in the USA, Europe and Japan particularly for market assessment, and with a dairy company, Kiwi Dairies Ltd, on aspects of the processing. Coordination was strategically vital, because of the long development period and so many groups involved in the development, and was effected by Whey Products New Zealand Ltd, another NZ Dairy Board subsidiary. The sequence of the development and the activities of the different groups are shown in Fig. 7.2.

7.3.1 Stage 1: Product strategy development

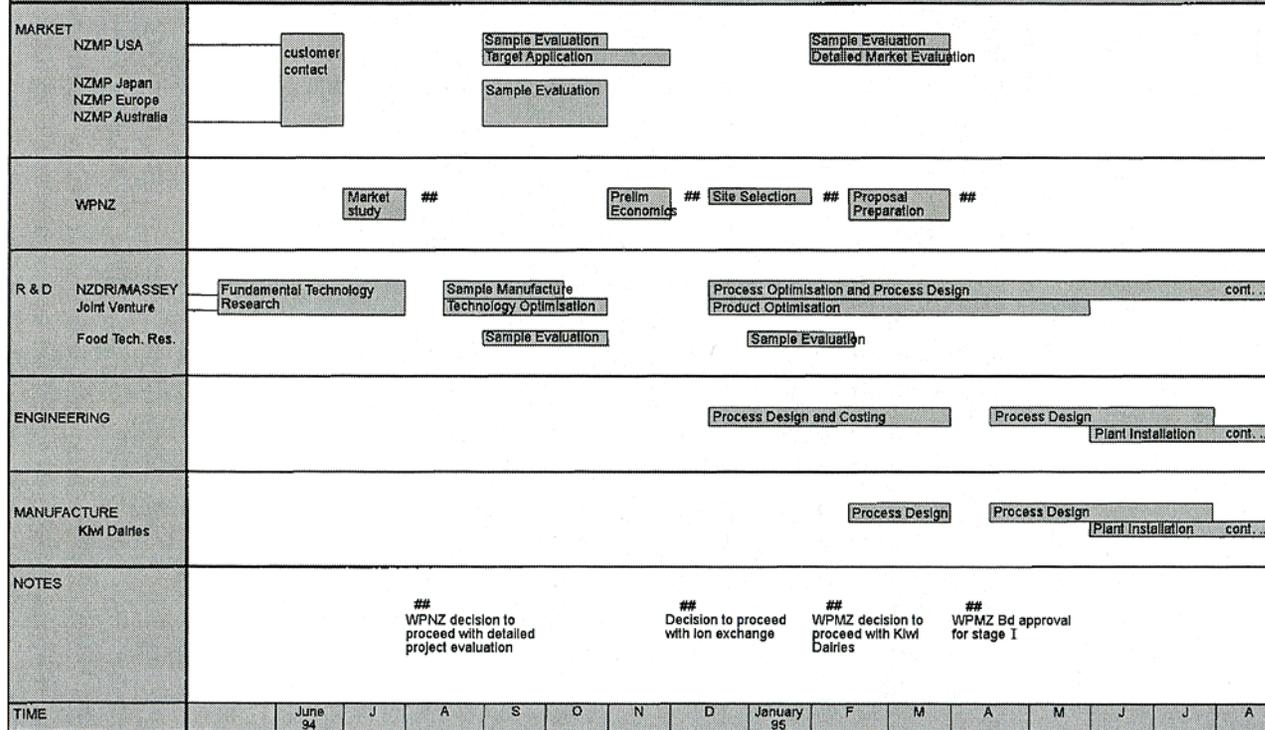
In the pre-design and development phase it was necessary to assemble knowledge, tacit and written, from a variety of sources within the various parties. This included:

- On the technical side –
 - (a) heat behaviour of whey proteins,
 - (b) properties and potentialities of ion exchange resins, which could separate even more tightly defined protein constituents,

ALACEN-895 PROJECT TIMELINE

page 1

cont.



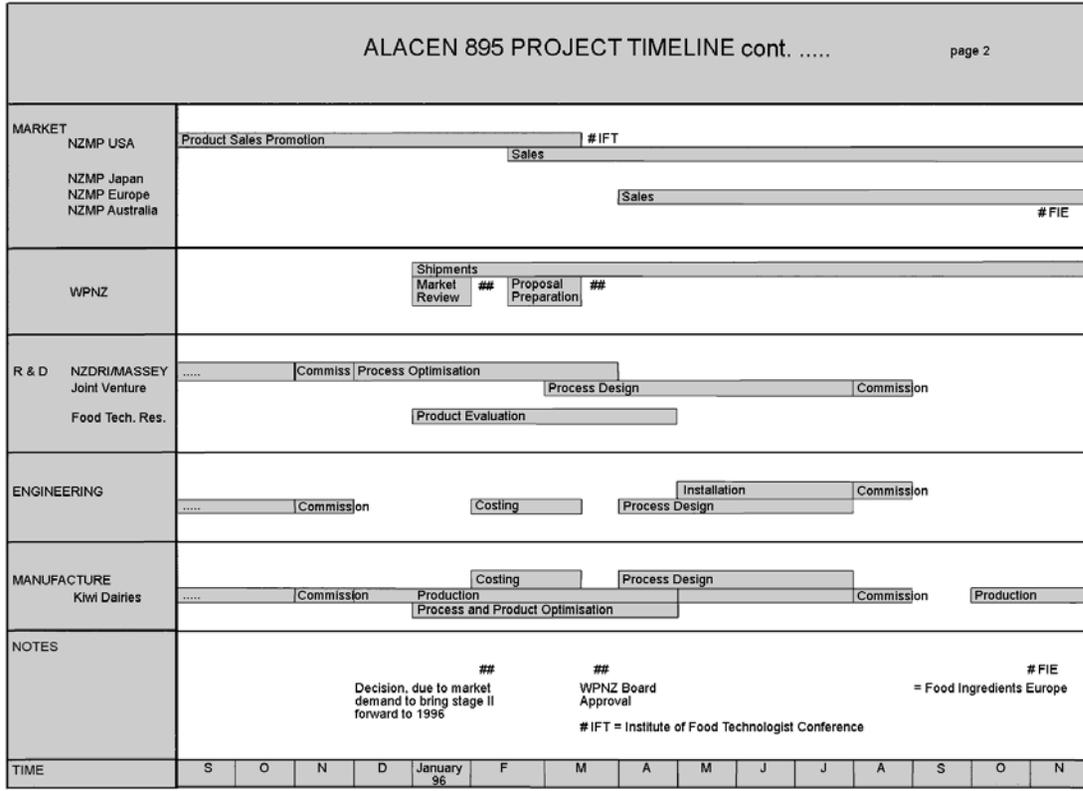


Fig. 7.2 Whey protein isolate time line.

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- (c) expected functional properties of various fractions that might be prepared, and
- (d) existing or achievable manufacturing processes which might be challenged or improved by new ingredients.
- On the marketing/commercial side –
 - (a) selected market, its demands, characteristics and expected growth,
 - (b) available raw material, whey, its increasing supply and competing uses,
 - (c) expected financial returns and their stability,
 - (d) security of the process against competitive inroads if the project proved successful,
 - (e) anticipated profitability of the venture.

So on the market side, the originality and the prospective impact of the product, and its critical formulation were established, together with its relation to technical advantages and to market imperatives. The NZ Dairy Board's international marketing network was used together with the vertically integrated structure which gave access to a very wide range of expertise to work with existing and potential customers, and to find what they wanted and would buy. On the processing side the use of ion-exchange resins for whey protein manufacture had been limited and small, worldwide, so extension of this was an essential part of the scheme and its costs had to be investigated and firmed up.

From these preliminary investigations the product concept emerged as:

- unique, competitively robust, acid beverage component powder;
- high-protein, low-lactose/cholesterol/fat;
- made from a wholly natural product, whey.

This would be designed for the expanding sports market in the USA, Europe and Japan. It would be produced by a process for which the basic data were predictable or accessible, the necessary technical developments should be achievable, and the raw materials were available. The venture should be profitable.

7.3.2 Stage 2: Product design and process development

A number of critical product qualities emerged from the product concept that required process investigation and development. Although some whey protein powders had been made previously, they were a substantial distance from the demanding specification that was deemed necessary for the proposed product concept. This was for a higher (90%) protein content, and for much reduced fat and lactose. To achieve these, increased use could be made of membrane separations. These would be used to remove the larger fat globules, but ran the risk of carrying some protein with the fat that would reduce the yield. So it was necessary to investigate preliminary modification of the flocculation of the fat globules before the microfiltration steps. Lactose, being a small molecule, would pass through the membranes with the protein, but it could be broken down into simpler sugars using

enzymes. Then came exploration of the ion exchange by which, after altering the acidity, the protein could be fastened and removed from the liquid whey on the ion-exchange resin and then subsequently unfastened and detached from the resin by altering the acidity again. All of these steps required careful exploration so that they would not only work in the laboratory, but also could be designed for full-scale plant operation, controlled sufficiently tightly to meet the specifications, and then transferred to a working factory for manufacture.

Along with the chemical composition, perhaps the most vital element of the product specification was the functional properties of the product, those properties that would make it uniquely suitable for its intended use and clearly superior to the competition. Important properties were:

- very high solubility in acid solution, so that a clear, high-protein liquid with an acidic taste would result on dissolving the powder;
- sufficiently bland flavour of its own so that added flavouring can determine the taste of the drink; and
- demonstrated nutritive value because it is this that convinces athletes of performance-enhancing potential.

All of these had to be built into a process that could adjust to a natural raw material, fresh milk, that varies compositionally throughout the dairying season, and still continue to produce from it large quantities of whey protein isolate to the very tight specification under which it would have to be sold.

7.3.3 Stage 3: Product commercialisation

An early survey of the market had indicated that there was a real opportunity in the acid beverage market for drinks, which at the same time as satisfying thirst, offered on a credible base increased endurance or performance to sports people. A prime key target was the USA, a large wealthy market where sports and exercise were widespread and glamorous. Investigation showed a potential business that could grow to over \$10 million of sales annually. Samples were prepared and sent for assessment to markets in the USA, Europe and Japan. These confirmed the concept of initial concentration on the USA and that the financial outcomes should be favourable. A strategy was prepared to pursue a staged plant development programme so that production and demand could increase in parallel.

The Food Technology Research Centre set up a model beverage system, developed by the New Zealand Dairy Board's North American subsidiary, and this was used to screen further samples as they emerged from the technical programme. They were also screened in the prospective markets in North America and elsewhere. Feedback from the screening was used to guide the continuing product and process developments. The feedback also confirmed good market acceptability for the product. With that, the directors of Whey Products New Zealand Ltd approved sufficient capital expenditure for a manufacturing plant at the site of one of the major operating dairy companies.

There was a great deal of design and planning to be undertaken, some of the plant being more or less standard equipment but some of it requiring novel features including high precision in operating and control detail. Engineers were engaged to design and to build and commission the required plant, which incorporated new and proprietary technology to meet demanding specifications. Final development of the ion exchange process was continued to meet the necessary deadlines. Also work was continued on aspects of the product protein functionality that was so critical to success on the market. Activities had to be undertaken in parallel and in sequence, and the necessary information, and a satisfactory trial product, had to be available as and when needed to move smoothly to the ensuing steps of the programme.

Coordination of the entire project was from Whey Products New Zealand Ltd. It was able to call on the vertically integrated New Zealand dairy industry as might be needed from time to time. The team included expertise in customer requirements, marketing, protein chemistry, ion-exchange technology and technical aspects of proteins for acid beverages, industrial whey powder manufacture, and product evaluation and model food system testing. A full manufacturing scale plant was built, installed and commissioned. Production duly started on time and on budget.

7.3.4 Stage 4: Product launch and evaluation

From late 1995 sales promotion information was fed to the chosen market. This was essentially beverage manufacturers. It was expedited through the close relations the NZ Dairy Board subsidiaries overseas had built up with leading beverage manufacturers and with major food processors. Shipments of product were started in about October 1995 so that commercial quantities would be available to US customers in 1996. A major promotion was as a featured product at the (US) Institute of Food Technologists' annual meeting at New Orleans in March 1996 where a group from New Zealand, including technical and marketing staff, was available to explain and demonstrate the product. There was extensive advertising in the food trade literature, and in handouts (see Box 7.3). An article on technical features of the product appeared in the American journal, *The Food Technologist*, in February 1996, setting out the background to the manufacture, and explaining the functional properties of the product, particularly those that were seen to offer major advantages.

The results of this were seen in the sales of 100 tonnes, all of the available product, in 1996. Confidence from this success led to the stepping up of production facilities and capacity towards 700 tonnes per annum at the first site, and the planning of expansions to 1000 tonnes annually. Financially, the returns were significant in lifting the value of standard whey protein concentrate from around NZ\$4000 per tonne to around NZ\$15,000 per tonne. Although the production costs were of course higher, and the development costs to this point were over NZ\$1 million, the overall returns for the industry were very satisfactory from what, not too many years earlier, had been seen as almost a waste stream.

Box 7.3 New Zealand Milk Products unveils whey protein isolates

To meet the growing interest in and demand for whey protein isolates, New Zealand Milk Products will be introducing the whey of the future at IFT (Institute of Food Technologists' Annual Meeting): ALACEN Whey Protein Isolates.

ALACEN Whey Protein Isolates are more than 90% high-purity protein, with less than 1% fat. In addition to superb nutrition, they provide excellent functionality – complete solubility plus acid and heat stability with a bland flavour. Clear RTD beverages benefit from ALACEN Whey Protein Isolates' unique transparency in solution, and foods requiring stringent nutritional labelling benefit from the WPI's low fat and low lactose levels. The instant versions of ALACEN Whey Protein Isolates are ideal for applications such as dry-mix beverages.

Source: Adapted from New Zealand Milk Products *NEWZ*.

Development was continued into both product quality and manufacturing improvements. It came from the technical product and process developments, which continued, and was augmented by comment and experience from customers. A reliable product was built up, with a good market. Whey protein isolate has continued to be a successful major product. As well as being the first of other specialised whey products for the New Zealand Dairy Board, it has, as an ingredient, itself made possible new and innovative products for many beverage and food manufacturers.

Think break

1. Discuss whether this whey protein isolate product was market- or technology-driven. Was this important? Do you consider it made any difference to the development pattern? To the launch?
2. Why do you think the promotion was largely directed to food technologists? Could other promotional targets have been usefully added? Substituted?
3. List the major criteria you think are essential to success in the health food market. Taking your local environment, do you think that a product such as this one would be successful, and why? What developments in the local culture might make it more successful?
4. What special features can you instance that distinguish food ingredient development from that of other food products?

7.4 Consumer products: new products and a new platform in variety sauces

For a large food manufacturer with an established market and reputation, a continuing line of new products is a vital dynamic element in strategy for growth and the future. Wattie Industries had been built up over about 30 years as the largest food processing company in New Zealand with also a substantial export business. It had a varied line of products including canned and frozen lines, and a major market share with a solid, quality, customer base. But its success and size then attracted various manipulations and reorganisations, over quite some years, and ultimately the international US company, H.J. Heinz, bought it. Today trading under the name Heinz Wattie's Limited it has become an important part of their international production resource with particular emphasis, outside of its local market, on Australia and Japan.

The activity in Hastings, New Zealand, located over three sites, employs about 1800 people at peak and for example annually produces about 40,000 tonnes of canned soups, baked beans and spaghetti for Heinz, Australia, and about 200,000 tonnes totally. It operates the largest hydrostatic cooker in the world, and the current canned food production rate is about half a billion units per year. A current major growth driver is the Japanese market; about NZ\$100 million has been spent on the plant in the last five years, much of it on sorting and handling equipment but also on up-to-date processing facilities. They have a product development team on site of over 40. The scene is of a large production unit of a large multinational company looking for new consumer food products on selected international markets.

The new product chosen was a line of speciality, variety sauces, and an outline of the PD Process that was used is shown in Table 7.5.

7.4.1 Stage 1: Product development strategy

In mid-1997 it was decided to look for a new sauce product to modernise the brand and open a new platform. At the time, the company had two basic tomato-based sauces with wide sales and a commanding market share, and some hot meal sauces packed in cans. There was nothing on offer in a more up-market, adventurous, range. Brainstorming produced the creative idea from which was born a concept and an advertising campaign; the product was then developed to fit the concept. So a brief emerged for a 'modern, quirky, fun sauce, of premium quality flavours to enhance experience and add some spice to life.' It could be benchmarked to potential competitors, and targeted to enter a smaller, highly fragmented market which at the time in New Zealand displayed 300 separate products from 31 brands. A different product was needed; more up-beat and up-market with several variants and designed to fit the concept. Six flavours were started, and the original six, with some slightly altered benchmarks, were what finished as market products. For a company that had built its reputation on dependable quality, everyday, best-value, products, it was a major marketing

Table 7.5 Activities in sauce PD Process

Product brief: 7 July 1997

Product strategy – inception of initial concept – preliminary product development work and planning – formulation of product development brief and project plan.

Decision: Acceptance to proceed as a Project by Product Manager

Product design: 9 July 1997 to 1 October 1997

Product design and process development – preliminary surveys and ball park costings – recipe formation, assessment and refinement – laboratory and ingredient and engineering assessment and experimentation – preliminary packaging – label information – cooking procedures – quality assessment and control procedures – to a full product and process specification.

Decision: Assessment and approval of plant related expenditures and project continuation.

Factory trials: 25 September 1997 **Finished product assessment:** 29 September 1997

Product commercialisation – factory trials – feedback and attention to shortcomings and problems – trial samples prepared and checked – factory operational planning – marketing planning – sales forecasts – final costings.

Decision: Acceptance of formal specifications and Approval to proceed to launch, by Senior Management.

Production: Started 22, 23, 24 October 1997 **Launch approval:** 22 October 1997

Launch: November 1997

Product launch and evaluation – factory production – presentation to sales and trade – marketing of products.

Review and continuation – feedback from sales, marketing, retailers – review of lines – withdrawal of less successful items and planning of additional items on the platform – further development and launches.

excursion. It was also a substantial challenge to their traditional formulation and packaging patterns though it seemed it would not present too many new problems in production. The brief therefore demanded an unusual product, justified unusual packaging, and cried out for an unusual brand name. It was a new platform in an extended environment.

The brief was assigned to a product manager from the marketing group, and presented to a product development team on 7 July 1997. The required time scale was very short, four months.

7.4.2 Stage 2: Product design and process development

Major innovative issues arose in formulation, including product characterisation and scaling up from batches of a few litres at the laboratory stage, through about 500 litres in the pilot plant to the thousands of litres in the batches in the production plant. Maintenance of the chosen desired flavour balance from the initial concept recipes to plant formulation involved much careful experimentation. The maintenance of final acidity after processing was critical to keeping quality and was difficult, especially with some of the sauces. Problems arose in

aspects such as sauce viscosities and behaviour of starches and thickeners, in separation of constituents such as oils in emulsions on standing, and liaison with and checking of suppliers to secure ingredients with low mould counts so that product shelf lives would be adequate. But the solutions were not so obvious and needed a good deal of laboratory and pilot plant work to find them.

Intensive action commenced on preparing the commercial products. Six separate and attractive sauces finally emerged in the initial platform. These had all to be formulated and set up to give a full product specification for production. This work started on 5 August and continued through that and the following month, reaching agreed products and plant procedures on 12 September.

Packaging and package design presented special problems. In the available time, it was not possible to design and make new bottles, so after exploring all possibilities, long fat-necked bottles, from a line of soft drink bottles that were available to the manufacturer, had to be used. Bottle capping with a hot fill containing recognisably large ingredient pieces had to be explored and accommodated, labels needed designing, and a deep anti-tamper sleeve organised. This deep sleeve turned out to have an additional advantage: the capability of the filler was somewhat limited but the deep label concealed any variation it produced. The different sauce varieties had slightly different specific gravities and all bottles were filled to the same nominal volume. This meant that the customers for the heavier varieties received a systematic advantage, or, put another way, the company was consistently giving away product with the heavier sauces, providing a strong inducement for the further development in due course of a more precise filler. Also, following on a product demonstration to the trade, it was decided to move the bottle tray configuration from 4 × 3 to 5 × 2, so as to improve display, and this required a last minute reorganisation and redesign of the corrugated board trays and cartons and their assembling lines. So packaging was a busy scene.

There were effectively three teams in the group working on the project; the product manager's team (in Auckland), and the product technology and packaging technology teams in Hastings. Their work had all to be coordinated and combined, drawing on the full knowledge of all members of the staff with appropriate expertise. Cooperation over a wide range of people and skills was excellent and contributed very substantially both to the successful outcome and to the speed with which it was reached.

7.4.3 Stage 3: Product commercialisation

Product factory trials were conducted, starting on 25 August, using members of the development team along with other local staff, as they were available. Innovation was needed to move from a substantially manual process line to a much more automated one. Some ingredients presented problems, for example plum pulp to maintain the desired consistency for a high-class product. There was extensive testing of the factory product, with the necessary adjustment of detailed procedures and formulation and ingredients to reach the texture, appearance and

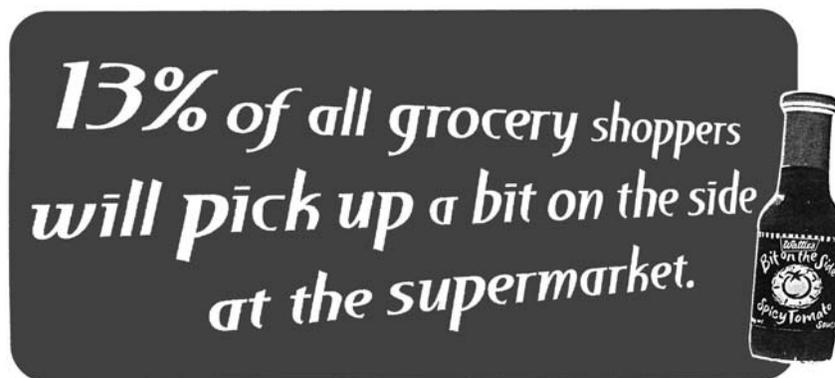
flavours desired for the product. Quality assessment and statistical process control procedures, that were substantially available, could be adapted and changed in detail to accommodate the special features of the new products.

Major attention continued to be devoted to the packaging. The hot-filling of a sauce with particulates into a difficult necked glass bottle was a new experience for the team, as was providing the deep plastic-wrapping round the screw caps. This involved checking and upgrading of skills and equipment, and careful attention was required to the glass capper and the in-line labeller. Finished product assessment could finally be undertaken by 29 August.

During this time there had been major activity on the marketing side. One very significant issue was the generic name of the new product platform sauces. That finally chosen was suggested by design consultants, and was 'A Bit on the Side'. The choice was the subject of some controversy. It was a departure from the tradition of largely straightforward descriptive titles. As a new adventurous product, displaying zip to a younger adventurous age group the title needed pep; but so much? In the event it was the platform name chosen, along with appropriately spicy individual sauce names incorporating rather minimal description, on mildly funky but clear labels, to maintain both interest and distinction for each of the six sauces.

7.4.4 Stage 4: Product launch and post-launch evaluation

The platform name was also strongly incorporated, and somewhat suggestively, in the publicity for the product. This was mainly by prominent billboards in the largest New Zealand (Auckland) market, just prior to and during the actual launch. It used a clever stratagem suggesting all manner of eager candidates for a 'Bit on the Side'; initially without revealing that a sauce was involved at all, and then completing the billboard by adding a picture of the labelled bottle, as illustrated in Fig. 7.3. The promotion certainly aroused curiosity and drew



B.B. Statistics courtesy of the 'You Must Be Asking Research Company'

Fig. 7.3 'Bit on the Side' sauce.

Box 7.4 Wattie's gets saucy

Business category manager, Rose France, says the market was ready for the new range with cheeky perceptions.

The time was right for a product and presentation with an identity of its own ... We wanted to produce something that was fresh, innovative and a little bit of fun to appeal to a new generation of Wattie's consumers – the 18 to 35 year olds and families with older children ... Product development required enormous patience – it's a trial and error process that involves endless cooking and tasting before testing and Bit on the Side tested very well within its target group ... Handling the glass bottles and neck seal was a first for the company and the results really come down to a great team effort ... We wanted something that was truly unique and differentiated our product – but while there might be slight innuendo about the name, it's really about reinforcing the way the sauces should be used and adding extra zest to the tastebuds.

Source: From a Heinz Wattie's house magazine.

attention. The implication was that the competing sauces were everyday. These new Heinz Wattie's products were for 'experiential' eating as illustrated in Box 7.4, which it was hoped would carry buying forward into repeats, and towards habits. There was also some limited TV advertising, featuring on brief cookery clips but at a very prime time spot. It was all well targeted. Sales of the new products rose rapidly, within three months, to brand leader, and the products have held a prime position on the New Zealand market since that time. Obviously a gap in the market was correctly identified, and filled, by satisfying products.

A subsequent development was the withdrawal of two of the sauces. These two were closest to the volume-market, and to Heinz Wattie's previously existing sauces which so many customers had found to be adequately satisfying. Perhaps there was not enough differentiation from these still very popular, and cheaper, products. To add to the offering and coverage however, more new flavours were added to the platform, giving the range indicated in Table 7.6.

After two years' success in New Zealand, 'Bit on the Side' sauce, with four products in the range, was introduced to the Australian market. After trials, the recipes had been modified and the flavours adapted to meet different consumer expectations. There was some both qualitative and quantitative consumer research. But the situation was rather different from that in New Zealand. There was a more advanced variety sauce market, better developed. There was TV promotion at the launch. But the market impact was substantially less than that in New Zealand. Analysis attributed this to the proliferation of sauces available in Australia and the segmentation of the market, to the campaign not building adequate initial awareness, and to the range offered being not large enough on the shelves there to

Table 7.6 Heinz Wattie's 'Bit on the Side' sauce range

<p>New Zealand: Launched 1997 – Sweet Chilli, Java Satay, Oriental Plum, Spicy Tomato, Gourmet BBQ (later deleted), Ketchup later deleted Added, 1999 – Sweet Mustard, Spiced Apricot, Cracker Cranberry Added 2000 – Cool Mint, Absolutely Apple, Salsa (four varieties) Australia: Launched 2000 – Sweet Chilli, Oriental Plum, Java Satay, Gourmet BBQ Added 2000 – Del Gourmet BBQ</p>
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impact sufficiently. Also it did not have the local momentum of the Wattie's brand that had helped carry it forward in New Zealand. The launch and subsequent history showed less impact and yielded smaller market share.

Overall the development has had success, both for itself and for indications of new avenues for further product lines. The impressively tight timetable, which was achieved by the product developers, is shown clearly in Table 7.5. Market share in New Zealand has been well retained, the line is established on the supermarket shelves, and occupies a new slot for Heinz Wattie's. There are intentions to carry the concepts and lines forward to the Japanese market.

Think break

1. Heinz Wattie's put the four new salsa products on to the existing product platform. Would it have been more effective to have started another product platform?
2. How do you see that further innovations could be built from this on to a new product platform?
3. This was an extremely fast, major product development, from brief to launch. What do you consider the essential elements allowing this to be achieved? What, if any, additional activities might have been able to improve the outcome?
4. If you were asked to launch a similar product on your home market, how would you go about it?

7.5 Some brief comments on the case studies

These case studies were selected to illustrate the PD Process in different but common food industry situations. They are not typical in that no one case is ever typical, but they show and demonstrate much that has been considered in this book, reinforce the claims that the concepts are practical, and briefly set out the way in which real product development problems have been handled.

The first case study looked at a fruit, fresh apples, that is quite a major commodity, moving from New Zealand to world markets with relatively little

processing. For fresh fruits, product development into new varieties can be a powerful tool in gaining and retaining market share, and the aim of the project was to develop a new type of apple which could lead to a number of varieties. A great deal of expertise had been built up and this substantially guided the project, though it was appreciated that this has vulnerabilities and increasingly inputs from the consumers are being sought. Modern technology has opened up possibilities for more organised and sophisticated technical developments for the growing processes, but this type of product development has special features of its own and in particular a long time scale which many food companies would find very hard to contemplate.

The second case study looked also at a fruit in which the primary concerns were to bring better returns from a significant export trade. Being very much a consumer product, the work was largely based around modern statistical techniques of consumer research. The study met two major objectives. One was to guide the shorter-term decision making in seeking a product that made the best of available fruit and its organisation on to the markets. The other was to generate information that can be used in the longer term to guide possible future breeding and improvement of the fruit lines.

The third case study demonstrated a step in a continuing programme for the generation of new and more valuable specialised food ingredients from a major food raw material. In this, highly sophisticated processing was employed, which had to be developed so that it was successful not only in production but also in the market. The basic information came from the literature, and this was further generated and extended, and industrially implemented, by the development technologists. There was much technical work to be done, both technical development in the product and in the processing, and in the technical sales. There were also quite major design and commissioning to be undertaken and with them capital expenditures, and marketing development. The resulting high-grade, highly specified ingredient had to be produced and exported to match into expensively promoted manufactured foods with elaborate and demanding acceptance criteria.

The fourth case study was a more typical one of a food manufacturer, a large well-established one, wishing to diversify into a new product and product platform. In this case the information employed was largely in-trade and in-house. A substantial product development and marketing organisation was in place, but there were still plenty of challenges. They included the designing of a rather different product and product image, the setting up and handling of packaging with problems new to this factory, the industrial line reorganisation needed, the possibility of adventurous marketing which was cleverly exploited, and, not the least, a very tight time scale.

7.6 Acknowledgements

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7.7 References

- EARLE, M. & EARLE, R. (2000) *Building the Future on New Products* (Leatherhead: Leatherhead Food R.A. Publishing).
- HUFFMAN, L.M. (1996) Processing whey protein for use as a food ingredient. *Food Technology*, 50(2), 49–53.
- NGARMSAK, T. (2000) *Development of Mango Products and Their Competitive Advantage in Export Markets* (Bangkok: Thailand Research Fund – translated from Thai).