

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

THE DESIGN OF A NEW BACON PRODUCT

A thesis presented in partial fulfilment of the requirements for the degree of Master of Technology in Food Technology at Massey University, Palmerston North, New Zealand.

Brian Herbert Patrick Wilkinson

1975

ABSTRACT

An initial examination of the New Zealand domestic meat market showed that the bacon industry was most in need of help from the development of new products. Per capita consumption of bacon and ham, products which provided almost 70% of the bacon industry's revenue, were shown to be declining. The aim of the project was to design new cured meat products which would replace bacon as the major revenue centre for the industry.

A market survey and two consumer surveys were carried out in Palmerston North with the aim of determining the reasons for the apparent decline in bacon and ham consumption. The three surveys were extended to include beef, sheep meat and pork cuts as well as ham, bacon and smallgoods so that the most consumer-acceptable cuts could be identified.

The market survey showed that the industry was in fact selling their bacon and ham through the most important retail outlets and while poor advertising and packaging might have been partly responsible for the decline in per capita consumption of bacon and ham, they did not appear to be the major cause.

The first consumer survey was carried out to see whether any changes in socio-economic factors such as household size, gross income of the household head or age of the housewife were responsible for the decline in consumption of bacon and ham. Trends evidenced in the New Zealand society since 1966, rather than contributing to the apparent decline in consumption of these products, were in actual fact favouring the consumption of these two meats.

The second consumer survey evaluated the attitudes of thirty Palmerston North housewives towards bacon and ham as well as a number of other meats. This survey identified the reasons for the apparent decline in consumption of bacon and ham. Bacon, in particular, was seen to have intermediate properties, intermediate between fresh meat and smallgoods.

The data from this second survey was examined by way of Principal component factor analysis and the following variables were isolated as being common to all meats: preference, nutrition, flavour, prestige and length of cooking. An analysis of main meal and snack meats identified additional variables which were unique to each meat group and still other variables were isolated for individual meat cuts. Together, these were hypothesised to be the blueprints for the individual products which enabled consumers to identify each meat product from a whole host of other meat products.

The consumer-acceptable meats were examined and the attributes responsible for the success of these products were identified and new cured products were designed, and these attributes were built into them.

ACKNOWLEDGEMENTS

This work was supported in the main by the Mauri Brothers and Thomson Award of Massey University.

The work was made possible by the guidance and encouragement of my major supervisor, Dr Mary Earle, to whom I shall always be grateful.

I am indebted to the good nature and inspiration of my wife, Helen, who made this project possible in more ways than meet the eye. I should also like to thank her for proof reading the manuscript.

I am also indebted to many others whose good nature I prevailed upon during the course of this project. In particular, I should like to thank:

The Food Technology Department, Massey University, for the use of their facilities.

The Computer Unit, Massey University, for computing facilities and help in programming.

The Library Staff, Massey University, for excellent reference material. Allan and Stuart for the many fruitful discussions which helped to crystallise many problems and Allan for his programming help.

Finally I must express my appreciation of the speed, skill and efficiency of my typist, Marion Trevor, in the preparation of this thesis.

Brian Wilkinson  
Palmerston North  
New Zealand

October, 1975

## CONTENTS

	<u>Page</u>
Abstract	i.
Acknowledgements	iii.
Tables	ix.
Figures	xi.
1. NEW PRODUCT DESIGN	1
1.1. Why Develop New Products	1
1.2. Requirements of Successful New Products	2
1.3. The Design of a Successful New Product	3
1.3.1. Planning	5
1.3.2. The design of the product	6
1.3.3. Product development	8
1.3.4. Evaluation	9
1.4. The Design of a New Meat Product	10
2. AN EVALUATION OF THE PALMERSTON NORTH MEAT MARKET	14
2.1. Meat Consumption in New Zealand	14
2.2. Market Survey of Palmerston North	20
2.3. Importance of Retail Outlets in the Sale of Meat in New Zealand	21
2.4. Manufacturers Supplying the Palmerston North Market with Meat	25
2.5. Processed Products Available in Palmerston North	29
2.6. Brand Preference and Brand Awareness	31
2.7. Pricing and Packaging	32
2.8. Meat Consumption Data - A Comparison Between Survey Results and the Official New Zealand Consumption Statistics	34
2.9. Conclusions	36
3. CONSUMER SURVEY OF PALMERSTON NORTH MEAT CONSUMPTION	39
3.1. Survey Procedures	39
3.2. Selection of Households for the Sample	40
3.3. Data Reliability	42
3.4. Sample Appraisal	44
3.4.1. Comparison of survey sample characteristics with the 1971 Census	45

3.5.	Red Meat Consumption	48
3.6.	Consumption of the Different Meat Cuts	51
3.7.	Frequency of Consumption of the Different Meats	56
3.8.	Frequency at which Consumers Bought Their Meat	57
3.9	Expenditure on meat per week	58
3.10.	Retail Outlets from which the Consumers Bought Their Meat	59
3.11.	Summary	62
4.	THE EFFECTS OF SOCIO-ECONOMIC FACTORS ON MEAT BUYING	64
4.1.	Effects of Household Characteristics on Food Buying	64
4.1.1.	Household size	65
4.1.2.	Income	65
4.1.3.	Household composition	65
4.1.4.	Other household variables	66
4.2.	Survey Procedure and Analysis	67
4.3.	Household Size: Its Effect on Meat Consumption	67
4.4.	Income of Household Head: Its Effect on Meat Consumption	75
4.5.	Age of Housewife: Its Effect on Meat Consumption	80
4.6.	Other Socio-economic Variables and Their Effect on Meat Consumption	85
4.7.	Summary	86
5.	CONSUMER BEHAVIOUR IN THE BUYING AND EATING OF MEAT	89
5.1.	Visual Preferences	91
5.2.	Eating Preferences	95
5.2.1.	Tenderness and texture	95
5.2.2.	Juiciness	96
5.2.3.	Flavour and odour	96
5.2.4.	Meat preferences	98
5.2.5.	Meat prices and budgets	99
5.2.6.	Consumers' meat buying behaviour	100
5.2.7.	Intangible meat preferences	100
5.3.	Overall Meat Preferences	100
5.4.	Methods Used in the Survey and Population Studied	104
5.4.1.	Questionnaire	106

5.4.2.	The sample	107
5.4.3.	Interviewing	108
5.4.4.	Analyses	108
5.5.	Meat Preferences	111
5.6.	Product Profiles - a Comparison of Meats	119
5.6.1.	Beef cuts	120
5.6.2.	Sheep meat cuts	122
5.6.3.	Pork cuts	122
5.6.4.	Ham cuts	126
5.6.5.	Bacon products	128
5.6.6.	Four sausage products	130
5.6.7.	Cooked sausage products	132
5.7.	Comparison of the Product Profiles of Rump Steak, Hawaiian Ham and Boiling Bacon	132
5.8.	Comparison of the Product Profiles of Slice Ham, Side Bacon and Luncheon	135
5.9.	Comparison of the Product Profiles of Rump Steak, Pork Sausages, Luncheon and Salami	137
5.10.	Comparison of Corned Beef and Side Bacon	139
5.11.	Discussion of Survey Methods	139
5.12.	Conclusions	142
5.13.	Recommendations	143
6.	IMPORTANT VARIABLES IN MEAT CONSUMPTION	146
6.1.	Quantitative Techniques and Use in Variable Analysis	148
6.2.	Analysis of Attitude Variables	150
6.3.	Isolation of Variables Common to All Meats	153
6.3.1.	Variable isolation by factor analysis	153
6.3.2.	Importance of variables common to all meats	155
6.3.3.	Conclusions	157
6.4.	Isolation of Variables Common to Groups of Meat	158
6.4.1.	Variable isolation by factor analysis	158
6.4.2.	Variable isolation by multiple regression	160
6.4.3.	Conclusions	164
6.5.	Isolation of Variables Associated with Individual Products	164



6.5.1.	Variable isolation by factor analysis	164
6.5.2.	Conclusions	166
6.6.	Comparison of Results	166
6.7.	Application of Results to Design	168
6.8.	Conclusions	172
7.	STRATEGY FOR NEW CURED MEAT PRODUCTS	174
7.1.	Product strategy	175
7.1.1.	Target group	175
7.1.2.	Target responses	175
7.1.3.	Financial aspects	176
7.1.4.	Production and engineering aspects	177
7.1.5.	Research and development aspects	178
7.1.6.	Marketing aspects	179
7.1.7.	Product aspects	180
7.2.	The New Zealand Bacon Industry	182
7.2.1.	Structure of the bacon industry	182
7.2.2.	Number of establishments in the bacon industry	183
7.2.3.	Pig numbers and the supply situation	184
7.2.4.	Production by the bacon industry	189
7.2.5.	Financial aspects of the bacon industry	193
7.2.6.	Research and development, technical knowledge and automation by the bacon industry	200
7.2.7.	Problems facing the New Zealand bacon industry	202
7.3.	Consumer Aspects	203
7.3.1.	Target group	203
7.3.2.	Target responses	203
7.4.	Marketing	208
7.4.1.	Quality/price relationships	209
7.4.2.	Number of package sizes	210
7.4.3.	Packaging	210
7.4.4.	Effect on sales of present products	212
7.5.	The Products	213
7.5.1.	Competing products	213
7.5.2.	Product life cycles	213
7.5.3.	Seasonality	214

7.5.4.	Product characteristics	214
7.6.	Requirements of the New Cured Products	215
7.6.1.	Sensual target responses	218
7.6.2.	Emotional target responses	219
7.6.3.	Rational target responses: main meal	220
7.6.4.	Rational target responses: snack meal	220
7.7.	Product Concepts	221
7.7.1.	Main meal	221
7.7.2.	Product suggestions	221
7.7.3.	Snack meal	223
7.7.4.	Product suggestions	223

Bibliography

Appendices

TABLES

	<u>Page</u>
1. Customer patronage of the different retail outlets in the New Zealand meat trade	22
2. Weight of meat sold through each retail outlet	23
3. Relative importance of the city and suburban butcher shops	25
4. Manufacturers supplying processed products	27
5. Processed products available in Palmerston North	30
6. Comparison of meat consumption (bone-in weights)	35
7. Derivation of final sample	45
8. Comparison of survey sample with 1971 Census data	46
9. Comparison of meat consumption by sample with monthly consumption as reported in the New Zealand Official Yearbook (1974)	49
10. Proportion of the sample who purchased each cut	52
11. Comparison of meat consumption by the whole sample with those who actually purchased each cut	53
12. Meat consumption by those people who purchased meat in bulk	55
13. Average consumption frequency of the different meats	56
14. Frequency of meat purchase	57
15. Average expenditure per week on meat	58
16. Trends in retail outlet patronage	60
17. Popularity of the different retail outlets	60
18. Popularity of the different retail outlets in the sale of ham and bacon	61
19. Size of households (includes families and non-families)	68
20. Characteristics of households according to household size	69
21. Percentage of each household size actually purchasing each cut	71
22. Meat consumption per person by household size	73
23. Percentage of total work force in each income bracket	75
24. Comparison of nominal and effective wage rates	77
25. Characteristics of the households according to gross annual income of the household head	77

26.	Meat consumption per person by gross income	78
27.	Characteristics of households according to the age of the housewife	81
28.	Per capita consumption of meat by age of housewife	83
29.	Meat preferences in Columbia, Missouri	99
30.	Bi-modal distribution for the different factors	109
31.	Spread frequency distribution on the various factors	110
32.	Meat preferences	112
33.	Ranking of the 24 meats on each of the eight variables	114
34.	Variables significantly correlated with preference and frequency of usage	115
35.	Frequency of serving of the pork cuts	118
36.	Isolated factors and their associated variables	153
37.	Importance of the different purchase variables	156
38.	Common variables for main and snack meal meats	158
39.	Variables associated with cured meat products	162
40.	Grouping of the variables within each factor for the 24 meats	165
41.	Factors to be considered in the product strategy	181
42.	Changes in number of establishments, 1964-1972	183
43.	Number of establishments in the ten statistical areas	185
44.	Production of bacon industry in relation to factory size	194
45.	Net value added (per man) (\$) by number of employees in each establishment	195
46.	Average net output (\$000) of firms in each statistical area	196
47.	Production costs for the whole bacon industry	198
48.	Individual production costs expressed as a percentage of the total costs	199

## FIGURES

	<u>Page</u>
1. The stages in product development	4
2. Red meat consumption patterns in New Zealand, Australia, United States and the United Kingdom, 1969 (%)	16
3. Total per capita consumption of red meat in New Zealand 1954-1970	17
4. Total per capita consumption of pork products in New Zealand 1954-1970	19
5. Effect of the confidence level on the sample size	43
6. The buying process conceived as a system of inputs and outputs	90
7. Product profiles of the four beef cuts	121
8. Product profiles of the three sheep meat cuts	122
9. Product profiles of the three pork cuts	124
10. Product profiles of the three ham cuts	127
11. Product profiles of the three bacon cuts	129
12. Product profiles of the four sausage products	131
13. Product profiles of two sausage products	133
14. Product profiles of rump steak, Hawaiian ham and boiling bacon	134
15. Product profiles of sliced ham, side bacon and luncheon	136
16. Product profiles of rump steak, pork sausages, luncheon and salami	138
17. Product profiles of corned beef and side bacon	140
18. Total pigs in New Zealand	186
19. Changes in the number of breeding sows in New Zealand 1958-72	188
20. Bacon industry's share of the bacon and ham market in New Zealand 1959-70	190
21. Bacon industry's share of the pork market 1954-72	192

CHAPTER 1NEW PRODUCT DESIGN

It is by no means always clear why companies need new products at all: or if they do, how many they need. An examination of the retail shelves in New Zealand indicates that firms have varying philosophies regarding the benefit of new products - some firms are particularly energetic but most tend to be conspicuous by their lack of new product development. Why this difference in attitude to new products? Most likely because of the different views that companies have of new products, as a way to either high profits or dismal failure.

There is little doubt that most new products fail. One Neilsen (78) analysis over 14 years showed that 54% of the new products on the United States market were withdrawn after test marketing, and one can assume that a few more were withdrawn after failing at the national launch stage. Krausher, Andrews, and Eassie in 1971 (55) noted that 410 new food products were introduced into the United Kingdom grocery trade in 1965. Five years later 60% of them had disappeared.

The reasons for their failure are many and varied, but they have had one thing in common, the new products failed to be better than existing ones (53). It would appear that too many new products were introduced indiscriminately, and there is a need for a method to determine more clearly what new products should be developed.

1.1. WHY DEVELOP NEW PRODUCTS?

Three justifications have been put forward for the development of new products: the product life cycle, the demands of technological change, and the need to grow (53).

The product life cycle theory says that any product's life is in four stages - introduction, growth, maturity and decline (60). A product's sales will grow until the needs it meets are satisfied, after which it is likely to grow only as fast as the population. When a new product emerges which will better meet these needs, then the sales of the product will decline. In its original form

the theory has been shown to be relevant in a number of United States markets.

(81) In a sense, it is bound to be valid, if taken to mean that every product introduced will reach a peak at some time and eventually disappear. The timing will of course vary for each product, spanning centuries for some basic food products such as potatoes and meat and weeks for others like the novelty ice-creams.

The second quoted reason for developing new products is related to technological change. In most industries, the rate of technological change has been accelerating over recent years and nowadays few companies could survive for very long without some product innovation. For instance, every time a new food preservation method is found, it has repercussions throughout the food industry.

The third reason for developing new food products is, for most companies, the only really valid one. Despite the costs, problems, and risks, they need new products to grow at the rate they have set themselves.

## 1.2 REQUIREMENTS OF SUCCESSFUL NEW PRODUCTS

For a product to be successful it requires two main characteristics, namely -

1. It must be salient to peoples' needs and desires. This first factor is self explanatory, though it must be emphasised that both the functional and the nonfunctional wants of the consumer must be considered.
2. It must be a unique blend of appeals. (53) This depends to a large extent on the brand. It is this singularity which enables the media to create a personality for the product giving it real and identifiable appeals. Without this consumers may feel cheated, leading to the subsequent failure of the product.

The new product may appeal to a specific sense, such as smell, touch, taste, sight or it can and is more likely to appeal to a combination of senses. This combination of senses to which the product is to appeal must be experimentally determined for the effective development of the product and the communications.

The product should also have a reason for existing, i.e. it must appeal because of what it contains or what it does. For instance, a food product could appeal because of its convenience, quality of ingredients, protein content, suitability for a specific age group or because of its low calorie content.

Finally, the product must appeal through the emotions. This type of appeal can make up a very large part of the personality of the product. It results from the nature of the associations which people have about the product. For instance, the emotional characteristics of a food could be changed by the way in which it is cooked - plain New Zealand or Continental. In cooking the food Continentally, the prestige rating of the food is heightened compared with plain New Zealand style cooked food.

### 1.3 THE DESIGN OF A SUCCESSFUL NEW PRODUCT

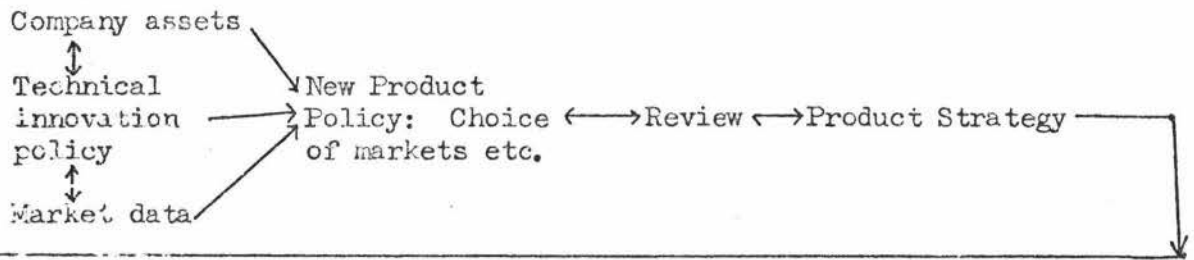
In design, the first problem centres around the question "How do you know that the product area selected or the product ideas developed are what the customer wants?" The next problem is to design the product which is wanted by the customer. General consumer requirements can be isolated with the aid of consumer research. How these consumer requirements are translated into actual products depends on company policy, the availability of skilled personnel and market opportunities. It is the interaction of these last three elements which results in the different products on the market which supposedly meet the same consumer requirements.

Four main stages can be isolated in the development of any new product. They are - planning, designing, development and evaluation. (24) These four stages represent a gradual refinement of ideas to the point where the product becomes a reality, and a gradual move from uncertainty towards a reasonable predictability (see Fig. 1). These four stages should be looked at separately as they represent logical steps in the development of the product, after which the project should be evaluated to decide which direction additional research ought to take or whether in fact the project should be stopped because the project is unlikely to succeed in its objectives. Each stage

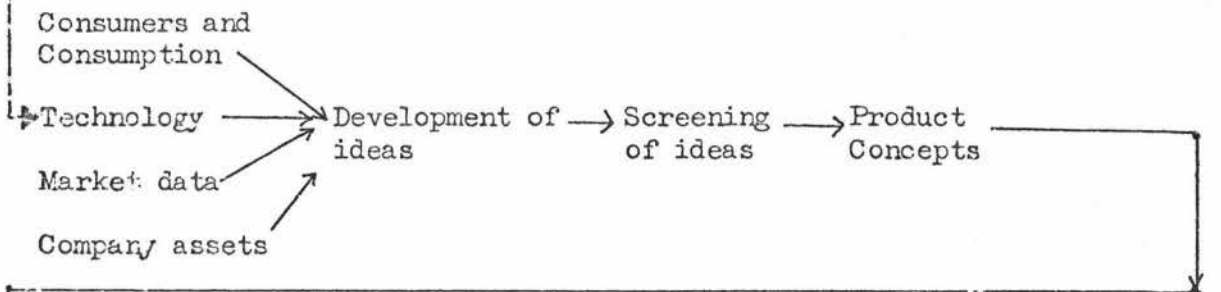


Fig. 1 The Stages in Product Development.

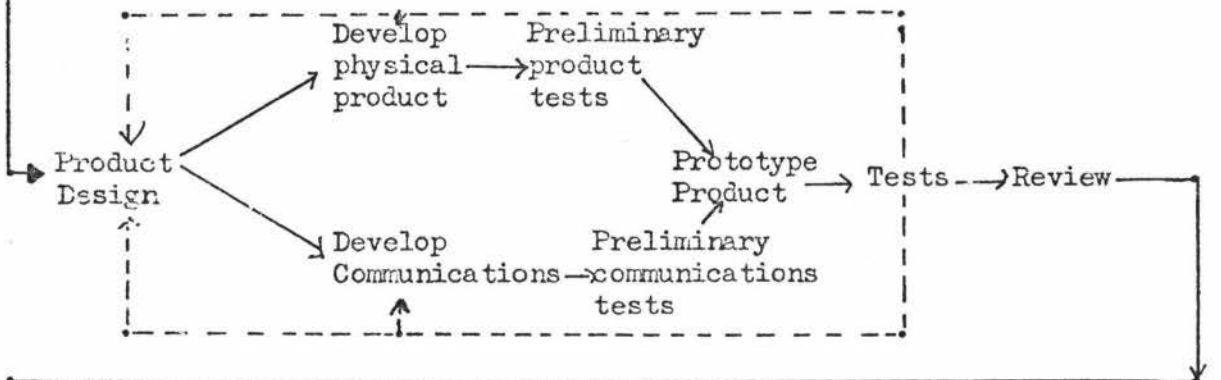
PLANNING STAGE



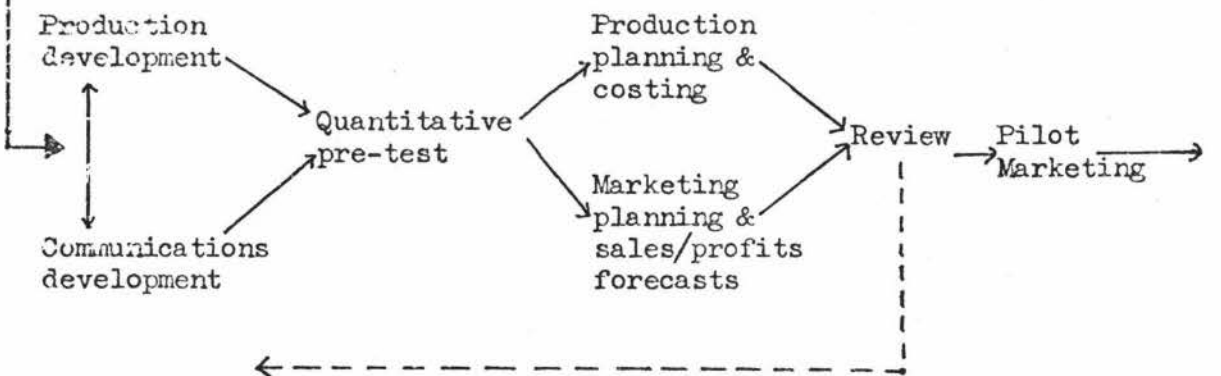
DESIGN STAGE



DEVELOPMENT STAGE



EVALUATION STAGE



represents an increasing degree of commitment by management to the product in terms of time and more importantly, company resources. Top management as well as the development team needs to examine the project at the completion of each stage.

1.3.1. Planning At the beginning of any new product development, the long-term company objectives are considered by the development team as these broadly define both the product areas which are to be examined and also define the markets at which the products are to be aimed. Having defined the product areas and markets to be researched, the development team then examines the existing technology and possible future trends, market structure, consumer behaviour and attitudes in the market. They obviously will not be able to obtain all this information from the literature and must undertake a certain amount of research to fill in the grey areas.

Every company has, or should have, long term financial, consumer, and technological objectives which are used in the definition of each product's objectives. Obviously no company wants to lose money as a result of a new product venture. How do they prevent such a mishap? Firstly they establish acceptable rates of return for any new product and secondly they develop only those products which meet a clearly defined consumer need which their existing marketing set-up and technological expertise can handle. Financial considerations might be such that the company management feels that it would be sufficiently rewarding for the company to either change its marketing policies or to develop new technological skills.

Once the product area has been defined, the team then suggests a whole range of product ideas which may be developed by a range of group techniques. At this stage of the programme, emphasis is on the production of as many ideas as is possible.

Screening of the product ideas is a natural development of the idea generation stage. The product ideas are evaluated by considerations of finance, the consumer, the market and technology. In the new marketing context, the consumer takes a central role in the development of new products, and as a result the other three objectives have tended to take a back-seat position until the actual ideas have been produced and then these three objectives have

been used to remove any products which are either not profitable or cannot be marketed through the company's existing marketing set-up. The screening stage is a semi-quantitative method of defining which products should be developed. It must be stressed that personal feelings concerning the worth of a particular product idea can and do creep into the selection process, unless very strict guidelines are established for the selection of the product. These guidelines should be established before any products are considered by the project team.

1.3.2. The design of the product This stage is characterised by a single process - the refinement of general product concepts to detailed product specifications.

The designer of a new product is always faced with certain constraints within which he must operate. The variables associated with finance, processing, raw materials, the market and the consumers inevitably lead to design restrictions. Financial considerations determine the cost of the project, the final price of the product, its expected rate of return, and can even determine the raw materials which may be considered in its design.

Probably the most important variable which must be considered in the design of a new product is the consumer. The designer is faced with the problem of determining the consumer's wants, the senses and emotions to which the product has to appeal and the use the consumer has for the product. The designer can only determine this by questioning the consumers, studying past behaviour or by psychological tests. He then has to translate this information into product requirements. At present there is a scarcity of information about the importance of the emotions in the selection of different foods. Little attempt has been made to transfer the consumer information into quantitative information which can be used in designing a product.

As well as these consumer variables, other variables to be taken into consideration in design are raw materials, their nutritional and functional properties; processing and its effect on the raw material properties, and market variables such as pricing and distribution.

How is this multitude of variables taken into consideration in the design of a new food product? At present there is no single quantitative technique

enabling the product designer to do this, although specific techniques have been developed to tackle certain aspects of the design phase. Linear programming has been applied in the formulation of new food products using nutritional and functional properties of the raw materials. (86) Multi-dimensional scaling, factor analysis, and multiple regression have been used in the definition of new product areas, but these three techniques have not been used in a predictive manner for the design of new products.

The most successful application of linear programming has been in the formulation of foods, where the problem is to formulate a food product either at minimum cost, or such that profit is maximised, from a mixture of raw materials of known cost, nutritional composition and sometimes physical and chemical properties, subject to product specifications of nutritional composition, physical, chemical and organoleptic properties. (90) This is the typical animal feedstuff application - a blending problem.

Factor analysis, multi-dimensional scaling, and multiple regression are essentially mathematical techniques which enable the designer to extract the most important common variables which consumers associate with specific products. Having isolated the most common variables of importance to the consumer, the designer is then able to concentrate on these variables in the final design of the product. Multi-dimensional scaling has the additional advantage of providing a multi-dimensional picture of products already on the market, and enables the designer to see at a glance new product opportunities.

The design stage of the new product requires the definition of the objectives which the product must meet, i.e. the synthesis of appeals which the product must be aimed at, the needs which it must satisfy and most importantly the form of the actual physical product, its shape, packaging, colour. These objectives become a design brief for the product development team. They are also used in the design of the communications which are an integral part of the product and both must be developed in parallel for perfect harmony between product and message to be realised. It is vital that the product and message are in harmony to ensure that the potential consumer will not be confused by different appeals, with the product claiming one thing and the communications another - diverging claims by product and message could lead to final product failure because of unfulfilled consumer needs.

Clearly then, some technique must be found which will enable the designer to draw upon all the information about the raw materials, processing, the consumer, market and finance and to use this in the design of new products. At present, much of the effort is being concentrated on the consumer and his requirements and more specifically his organoleptic requirements. The organoleptic properties would appear to be the most difficult to quantify and for this reason little or no work which comprehensively includes all the organoleptic variables both objective and subjective has been published.

1.3.3. Product development      The product development stage is a natural extension of the design stage and is essentially the transformation of the product specifications, i.e. the product design, into a physical product reality. The physical product and communications are produced apart and then brought together as the prototype new product. (53)

If the design is all it should be, then the development team will have a clear idea of what raw materials are to be included in the product, their quality, the type of process to be used for making the product, the colour and form of the product plus all the other sensory attributes which the product is supposed to have, the packaging and finally the market and method of distribution. Knowing exactly who the product is aimed at is essential as it enables the team to select a specific type of panelist for subsequent testing of the product. This in turn increases the likelihood of success because it has met the approval of the people at which the product was initially aimed.

The development stage goes through a natural evolution from the position of a theoretical product to a reality. In other words, the development team has a model product before them, and they attempt to make it a reality, always mindful of the fact they may have to modify the model in the light of subsequent experimentation.

At the start of any development programme it pays to "play" with the raw materials to obtain a "feel" for the materials as this enables a more effective and systematic programme to be developed for the project. Having got a "feel" for the materials, the team then proceeds with the development on the laboratory scale until such time as the new product is judged to meet the specific design

requirements. Once this stage is reached, then the product is produced on an increasingly large scale until sufficient has been produced for a market test. Going to large scales ensures that every effort is made to prevent scale-up problems and that the final mass-produced product does in fact meet the original or modified design criteria. Adequate testing must be carried out at all stages of the development as this is the only way of keeping the product to the original specifications. The final test before the product is finally handed over to the production people is the market test as this is the last chance for the development team to correct any product mistakes and the last chance for the management to say yea or nay to the launching of the product.

1.3.4. Evaluation The product and message are each tested separately, the results are fed back, and if necessary, either the strategy or even the product and messages are redesigned, from which a revised product or message arrives for testing. This cycle is continued until the new product and message comply with the criteria established for them, at which time the message and product are combined for further testing. This further testing generally takes the form of a market test. Basic to this whole process is the idea of evaluation - at the end of each test the results are evaluated to see whether the product is approaching the criteria established for it; if not, then the product or message is modified to more clearly meet these objectives. At the end of each test the management can take the decision to either continue with the project or drop it. This is critical at the end of the market test.

The aim of the present project was to examine the New Zealand domestic meat market with the idea of identifying product opportunities, i.e. sections of the industry in need of product development, and once this had been done to examine the financial, market and consumer requirements for the new products with the aim of producing products which would help the particular section of the industry, and products which would clearly meet the consumers' requirements. It was envisaged that the products would have to be new, if the project was to have any lasting benefit to the industry.



#### 1.4. THE DESIGN OF A NEW MEAT PRODUCT

The following elements must be considered in the design of any new product -

- (a) The company and its objectives
- (b) The market and trends within the market
- (c) The technology; and finally
- (d) The consumer - his or her needs and attitudes

In the present project there were no company objectives to meet as the project was not aimed at any one company, but rather at a whole industry - the New Zealand bacon and smallgoods industry and in particular the Manawatu section of this industry. Consequently, industry objectives had to replace company objectives for the present project. This in turn meant that the terms of reference for the project had to be such as to benefit the whole industry - though at some stage of the project, consideration of the above four elements might have limited the study to a specific section of the industry.

How can product areas, and in the context of the project, industry areas, be defined for subsequent product research? One method is to call upon the product life cycle concept to define the sections of the industry which require additional product research. According to this concept almost every product goes through four stages, similarly, the product's profits go through associated stages of development - the introduction stage is characterised by low profits, the growth stage by increasing profits, the maturity by steady profits and the decay stage by declining profits. If product life cycles are developed for all the major meat types, the products which effectively encompass the New Zealand meat market, then this should provide some indication of the areas which ought to be examined for new product development.

If only those product areas which are in the decay stage of their life cycles were selected, then this would ensure that only those product areas which most need new products did in fact get them. Clearly then, the new products would meet one of the major objectives of the project, namely that of meeting the needs of a section of the meat industry.

The three other objectives, namely, the market, the consumer and the technology

must also be met for the product to be a success. Consider first the market as this requires an examination of the following factors at least, if the project is to be appraised thoroughly -

1. The products
2. The price of the products
3. The place through which the products are sold
4. The promotion of these products

One of the terms of reference of the project is that the products must be new. How can this be ensured? Obviously a thorough knowledge of all the meat products on the local market would prevent product duplication of existing products. Moreover, it would be beneficial to examine products which are selling well on the Palmerston North market and to compare these with products whose sales are declining to enable some of the attributes of the more successful products to be built into the less successful products, thus creating new products which would be more competitive on the local market.

The price of all the meat products available on the local market is an important variable in that they establish upper and lower bounds within which the price of any newly developed products must fall, if they are to be at all competitive with similar existing products.

The market share of the different retail outlets is another important marketing variable which must be monitored by the industry if it is to maintain its share of the market. The industry must sell its products through the retail outlets which command the largest share of the market both the present and future. The industry must maintain a flexible approach to market channels so that it can constantly modify its policy in the light of emerging trends. One of the purposes of the present project was to examine channel trends.

The various market channels have specific requirements for the product and the industry must be aware of these if it is to take advantage of changes in importance of the different market channels. The supermarket outlets for instance, require a completely different product to that sold in the butcher shop. The most noticeable requirement is the packaging - virtually non-existent in the butcher shop, in complete contrast to the often elaborate



packaging in the supermarkets.

The final marketing variable to be considered in the project was promotion. No attempt was made to study the promotional strategies of the different companies supplying the Palmerston North market, but only the effect of their promotional campaigns by evaluating consumer brand awareness and also their brand preference to bacon and ham in Palmerston North.

In this way, it was planned to establish the effectiveness of previous promotion and whether or not the industry should consider a more effective promotional scheme in the future.

A consumer's needs have been shown to be dependent on a number of socio-economic variables, such as per capita income, marital status, number of children in the family, number of people working and finally the occupation of members of the household. (89) Very little information is available in New Zealand on the effects of the different socio-economic factors on the purchase of meat and the present project set-out to determine which socio-economic variables were important in determining the types of meat purchased by the Palmerston North housewives.

While socio-economic data is meaningful to the marketer as it enables him to segment his market, it is not particularly helpful to the product designer as the information is passive in nature. The product designer requires information which is active providing him with the requisite directions in which he must go to make his product. Measurement of attitudes towards products provides the product designer with the requisite directional information, but it must be remembered that attitudes to products tend to be modified and reflected by the socio-economic predicament of the consumer.

The present project set out to determine attitudes common to 24 meat cuts so that there would be a common base from which to design new meat products. Very little information was available on the attitudes of New Zealand housewives to meat and for this reason a survey was carried out to obtain the required information.

It must be stressed that no effort was made to measure the meat consumption

of the catering sector and it is appreciated that this sector accounts for a substantial proportion of total meat consumption in New Zealand.