SEAFOOD CONSUMPTION CHARACTERISTICS AND PURCHASING PATTERNS OF DARWIN

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CONTENTS

ACKNOWLEDGEMENTS

LIST OF TABLES i-iv

1. INTRODUCTION 1-6

1.1 Seafood Consumption Surveys
1.2 Objectives of Research
1.3 Role of the Consumer in Marketing
1.4 World Seafood Consumption Patterns

2. METHODOLOGY 6-12

2.1 Sampling Procedure
2.2 Questionnaire Design

3. DEMOGRAPHIC, SOCIO-ECONOMIC BACKGROUND 13-17

3.1 Population Distribution and Growth
3.2 Urban/Residential Characteristics
3.3 Household Composition
3.4 Household Population
3.5 Employment and Education
3.6 Income Distribution
3.7 Ethnicity and Religion

4. FORMS OF SEAFOOD CONSUMPTION 19-23

5. NON-CONSUMPTION OF SEAFOOD 24-28

6. CONSUMPTION FREQUENCIES 29-50

6.1 Consumption Per Month
6.2 Weight of an Average Serving of Seafood
6.3 Annual Per Capita Consumption

7. SPECIES CONSUMED 51-63

7.1 Fresh Fish and Shellfish
7.2 Frozen Pre-packaged Fish and Shellfish
7.3 Smoked, Cured, Dried Fish and Shellfish
7.4 Canned fish and Shellfish
7.5 Favourite species of the Household

8. HOUSE CHARACTERISTICS OF SERVING SEAFOOD 64-67

8.1 Days of the Week when Seafood was Served
8.2 Meals at which Seafood was Served
8.3 Methods of Cooking Seafood

9. CONSUMPTION OUTSIDE THE HOME 68-71

9.1 Income
9.2 Frequency of Consumption
9.3 Species Consumed

10. ATTITUDES TO CONSUMPTION 72-73

11. PURCHASING PATTERNS 74-83

11.1 Source of Purchase
11.2 Purchase Preferences
11.3 Consumer Attitudes to Purchases

12. FISHING HOUSEHOLDS 84-90

12.1 Ethnic Households
12.2 Recreational and Commercial Fishing
12.3 Experience and Frequency in Fishing
12.4 Weight of Fish Caught
12.5 Distribution of Catch
12.6 Location of Fishing Activity

13. THE ABORIGINAL HOUSEHOLD 91-96

13.1 Background Information
13.2 Socio-Economic Characteristics
13.3 Seafood Consumption Characteristics
13.4 Seafood Purchasing Characteristics
13.5 Fishing Activity of Households
13.6 General Consumptions Characteristics

14. A LOOK TO THE FUTURE 97-110

REFERENCES 111

APPENDICES

LIST OF TABLES

Table No.	Description
1	Current and Projected Per Capita Consumption (Kg) of Seafood for Selected Countries
2	Consumption of Different Forms of Seafood
3	Consumption Frequencies of Different Forms of Fish and Shellfish
4	Non-consumers of Different Forms of Seafood
5	Non-consumers of Different Forms of Fish and Shellfish in Darwin and other State Capitals
6	Frequency of Persons in Consumer Households not Consuming Seafood
7	Reasons for Non-consumption of all Forms of Seafood
8	Percentage Distribution of Reasons for Non-consumption of Different Forms of Seafood
9	Monthly Consumption of Fresh Fish
10	Monthly Consumption of Fresh Shellfish
11	Monthly Consumption of Frozen Pre-Packaged Fish
12	Monthly Consumption of Frozen Pre-Packaged Shellfish
13	Monthly Consumption of Smoked Fish
14	Monthly Consumption of Smoked Shellfish

Table No.	Description
15	Monthly Consumption of Canned Fish
16	Monthly Consumption of Canned Shellfish
17	Monthly Consumption of Poultry
18	Monthly Consumption of Meat
19	Percentage Distribution of Fresh Fish Consumption
20	Percentage Distribution of Fresh Shellfish Consumption
21	Percentage Distribution of Frozen Pre-Packed Fish Consumption
22	Percentage Distribution of Frozen Pre-Packed Shellfish Consumption
23	Percentage Distribution of Smoked, Cured, Kippered, Dried, Fish Consumption
24	Percentage Distribution of Smoked, Cured, Kippered, Dried, Shellfish Consumption
25	Percentage Distribution of Canned Fish Consumption
26	Percentage Distribution of Canned Shellfish Consumption
27	Annual Per Capita Consumption of Seafood for sample Households and Population in Darwin
28	Annual Per Capita Consumption of Each Form of Seafood for Capital Cities (1976-77)
29	Fresh Fish and Shellfish Species Consumed at Home
30	Most Popular Species of Fresh Seafood Consumed by Different Ethnic Groups

Table No.	Description
31	Most Popular Species of Fresh Seafood Consumed by Different Income Groups
32	Frozen Pre-Packaged Fish and Shellfish Species Consumed at Home
33	Smoked, Cured, Kippered, Dried Fish and Shellfish Species Consumed at Home
34	Canned Fish and Shellfish Species Consumed at Home
35	Most Popular Species of Canned Seafood Consumed by Different Income Groups
36	Most Preferred Fish and Shellfish Species of Householders
37	The Most Preferred Seafood Species by Ethnic Groups
38	Day of the Week Each Form of Seafood was Served at Home: Percentage of Consumption Occasions
39	Meal at Which each Form of Seafood was Served at Home: Percentage of Occasions
40	Cooking Method for Fish and Shellfish Served at Home: Percentage of Occasions
41	Consumption of Seafood Outside the Home
42	Consumption of Seafood at Restaurants by Income: Percentage Occasions
43	Monthly Consumption of Seafood at Takeaway Outlets
44	Monthly Consumption of Seafood at Restaurants
45	Seafood Species Consumed at Takeaway Outlets

Table No.	Description
46	Seafood Species Consumed at Restaurants
47	Ciguatera Awareness Among Seafood Consumer Households
48	Effect of Ciguatera Awareness on Seafood Consumption
49	Source of Seafood Purchase: Percentage Occasions
50	Preference for Purchase Form of Fresh Fish
51	Willingness of Consumers to Try New Species Introduced to the Market
52	Householders With or Without Complaints Regarding Different Forms of Seafood
53	Complaints Regarding Different Forms of Seafood
54	Households Engaged in Fishing Activity
55	Fishing Households by Country of Ethnic Origin: Percentage Occasions
56	Recreational/Commercial Fishing Activity
57	Fishing Experience
58	Frequency of Amateur Fishing
59	Average Weight of Fish Caught per Fishing Trip
60	Distribution of Catch
61	Location of Fishing Activity
62	Major Species of Fish and Shellfish Caught by Fishing Households

CHAPTER 1. INTRODUCTION

1.1 SEAFOOD CONSUMPTION SURVEYS

Research into seafood (fish and shellfish) consumption and marketing behaviour is a relatively new field with limited available data. In Australia to date, research carried out in this direction is restricted to a capital cities survey, excluding Darwin, of 1976-77 (Department of Primary Industry, Canberra, 1978), a Northern and Central Queensland survey of 1979-80 (Bandaranaike, 1981) and a survey of the Moreton region, Queensland in 1982-83 (Bandaranaike, Newman and Hundloe, 1984). In 1981 a similar survey was conducted in Darwin to establish patterns of seafood consumption and purchasing patterns of seafood consumption and purchasing behaviour within the urban area. The results of the findings of the latter survey are presented in this report. Even though the time span of the different seafood consumption surveys conducted in Australia vary widely, the data from these surveys are used in this report for comparative purposes.

1.2 OBJECTIVES

The specific objectives of this research were to:

i) analyse variations in seafood consumption patterns within Darwin;

ii) examine differences in seafood purchasing habits;

iii) identify varying attitudes to seafood consumption;

iv) highlight the influence of specific socio-economic variables on seafood consumption;

v) establish the contribution of amateur fishing households to seafood consumption;

vi) establish the impact of seafood consumption outside the household, i.e. at restaurants and takeaway outlets;

vii) examine patterns of seafood consumption among urban Aboriginal communities within Darwin;

viii) compare patterns of seafood consumption in Darwin with those of other capital cities in Australia.

The aim of this research therefore, is to highlight certain marketing problems in the fishing industry and suggest possible ways of improving the status of the industry via marketing management strategies. It must be noted that this research is not aimed at providing a complete solution to all the problems of the fishing industry.

1.3 ROLE OF THE CONSUMER IN MARKETING

In examining consumption characteristics and purchasing patterns, we are in effect looking at the role of the consumer in the marketing process. Consumer behaviour has been defined as the "acts of individuals directly involved in obtaining and using economic goods and services (in this case seafood), including the decision processes that precede and determine these acts" (Engel, Kollat and Blackwell, 1968). Therefore in this report analysis of consumer behaviour includes what people consume, where, how often and under what conditions these goods and services are consumed.

There is a subtle difference between the consumer and the buyer or the purchasing agent. The consumer of a given purchase and the person making the purchase are often two different people. In many instances, the purchase is made for a household (the sampling unit in this survey), and the buyer or the purchasing agent is only one of those who will share in its use. The interaction between the consumer, the buyer, and others who influence the final decision, determines the particular product which is chosen. In this research the household was selected as the sampling unit in order to include the influences of the total family (or other group) on the behaviour of the buyer. In the first half of the report, consumption characteristics of the entire household are analysed and in the second half purchasing patterns of the buyer are analysed.

In this research we are concerned with a micromarketing problem, that is, how the Northern Territory economy should meet the demand for seafood of its people and the most efficient way to organise its distribution. Information sought in this research is of vital importance to the fishermen, the seafood marketers and the fishing industry in general. Ultimately the overall benefits of this research will undoubtedly spread to the consumer.

1.4 WORLD SEAFOOD CONSUMPTION PATTERNS

Table 1 provides information on current and projected per capita consumption of seafood for selected countries.

Fish and shellfish play an important role in the Japanese diet. Even though levels of seafood consumption have always remained high in Japan, more recently a slight decline in this trend has been noted. This is partly attributed to shifts in traditional fishing grounds resulting from the implementation of the 200 mile fisheries zone and partly a result of the changing life style in Japan, i.e. increasing female participation in the workforce, higher household income, increased leisure time and interest in Western

style food and food preparation. Of the total animal protein intake in Japan fish protein comprised more than half the total until 1970. Since then there has been a steady decline in favour of other animal protein. This has been of some concern to the Japanese fishing industry.

Spain, with a population of approximately 38 million, ranks ninth in the world in per capita consumption of seafood. It is noteworthy that most countries bordering the Mediterranean Sea have apparently high levels of seafood consumption. In conjunction with the anticipated rapid growth in the Spanish population, the total market demand for seafood in Spain is expected to increase by more than 10 percent by 1985. It has been predicted that fresh fish will soon become a luxury item in Spain. On the other hand, shellfish products imported mainly from Europe and the Caribbean are consumed on a large scale.

Portugal, located adjacent to Spain and bordering the Atlantic Ocean has relatively high consumption rates. According to the Food and Agricultural Organisation (FAO) estimates for 1972-74, Portugal had the third highest consumption rate in the world - 58.5 kg. However, as Table 1 indicates there has been a steady decline in per capita consumption since 1977. Unlike in Japan or Spain, here 30 to 40 percent of the fish consumed is frozen. Owing to difficulties of obtaining fresh seafood, and accelerating prices, frozen fish consumption is expected to increase in the future.

The French are well known for their culinary interests and as such have a growing market for fish and fisheries based products. According to FAO figures France averaged 21.5 kilograms per annum during the 1972-74 period and is projected to rise to 23.5 to 24.1 kg by 1985. More detailed per capita consumption figures show 73 percent is consumed in fresh and refrigerated form, 19 percent as frozen, 6 percent as canned and 2 percent as salted, cured or dried. It has been predicted that higher processed luxury species will be in increasing demand in the French market for seafood.

Within the European Economic Community, Belgium has one of the highest ratings of per capita consumption (15.2 kg). However its consumption has remained relatively stable over the past two decades and is expected to decline in the future, particularly in fresh fish. As an outcome of increasing consumer affluence, the consumption of crustaceans and molluscs has risen on the one hand, and interest in preserved fish declined on the other. Also with larger numbers of women joining the workforce frozen pre-packaged seafoods have gained in popularity.

TABLE 1: Current and Projected Per Capita Consumption (kg) of Seafood for Selected Countries

COUNTRY	POPULATION '81 (Millions)	1977	1981	1985
Japan	118.7	65.7	65.0	65.0
Spain	38.0	40.0	41.0	42.0
Portugal	10.0	35.8	35.0	35.0
France	55.0	22.0	23.0	24.0
Finland	4.7	18.5	18.5	18.5
Belgium	10.4	15.2	15.2	15.4
Sweden	-	16.8	16.7	16.5
Netherlands	14.2	12.0	12.1	12.3
W. Germany	61.4	8.9	9.3	-
Greece	9.6	9.2	9.6	10.1
Canada	24.4	7.5	8.7	10.4
United Kingdom	55.7	7.4	7.9	8.0

Source: Adapted from various reports of Worldwide Fisheries Marketing Study: Prospects to 1985, Government of Canada, 1979 December.

Finland and Sweden are somewhat restricted in their access to fresh fish supplies owing to their brackish water location on the Baltic Sea. Since the declaration of the 200 mile economic zone there has been increased pressure on the Baltic Sea's resources by the Swedes, Germans and Danes. The Finnish are conservative consumers and major changes in seafood consumption are not expected in the future. Owing to the prevalence of large numbers of inland water bodies, it is anticipated that there may be a slow move towards the consumption of fresh water species and away from saltwater fish. Sweden is in a similar position to Finland and here too a definite decline in seafood consumption has been predicted.

Even though West Germany is faced with the problem of a decline in population from approximately 61 million in 1978 to 59.7 million in 1985, this is not expected to affect the overall demand for fish products. In West Germany there is an increasing demand for frozen pre-packaged products. More than half the sales of frozen fish products are in the form of breaded fillets. Overall, the per capita consumption is stable and is not expected to decline sharply in the future.

Whilst the population of Netherlands is expected to increase to approximately 14.6 million by 1985, its per capita consumption is expected to rise slowly from the current level of 12.1 kg to 12.3 kg by 1985. Owing to the escalating prices for herring, the most preferred species, there has been a slight decrease in total fresh fish consumption. In contrast, shellfish consumption particularly of crustaceans and mussels, has shown an increase in the last few years.

Greece, with a population of less than that of Australia, has a growing per capita consumption. The per capita consumption has grown substantially from 10.6 kg in 1976 to 13.0 kg in 1981 and is expected to increase up to 15.0 kg by 1985. Greece requires to import considerable quantities of fish products to supplement declining domestic production and to cater to traditional as well as new and expanding consumer preferences.

Even though Canada has a population which is twice that of Australia, and a total fish and shellfish production far in excess, its per capita consumption rate is similar to that of Australia (between 8 and 9 kg per head). As in Australia, Canada has a high import to domestic fish product consumption ratio despite its large fisheries resource. Fish consumption in Canada was fairly static up to the mid 1980s, and since then a quite significant increase has been noticeable. The most rapid growth rate is predicted in the category of frozen fillets and blocks with consumption levels expected to increase by approximately 10 percent per annum.

During the 1960s the United Kingdom had a per capita seafood consumption level of 8.8 kg. This dropped to 8.1 kg during 1972-76. The decline was mainly in fresh, frozen and cured products. The demand for canned products remained relatively stable and that of shellfish increased. After 1976, consumption trends appear to show signs of gradual increase. This is mainly because declining sales of fresh fish have been offset by an increase in demand for frozen fish products.

Various estimates have been given for Australia's per capita consumption, ranging from 5 kg to 9 kg per annum. Most of these however, are underestimates since adequate consideration has not been given for example to seafood consumed via amateur fishing activity which comprises a significant component of most Australian households (Bandaranaike, 1981, p.28). Official statistics of consumption take into consideration commercial production, exports, imports and stock changes. This figure is then divided by the estimated mean population of Australia in the relevant year. A more accurate means of calculating per capita consumption is to estimate consumption trends per person via a household survey such as the Australian capital cities survey or the survey discussed in this report. However, based on given estimates of seafood consumption (8 to 10 kg per head), Australia still has a long way to go before approaching the levels of consumption of traditional fish eating countries such as Japan and those bordering the Mediterranean Sea such as France, Spain and Portugal.

CHAPTER 2. METHODOLOGY

2.1 SAMPLING PROCEDURE

The household was selected as the sampling unit since the decision making process and the act of consumption is more meaningfully measured within a household as opposed to a particular individual. A 'household' was defined as a place where one or more persons shared common food supplies.

The Darwin urban area was divided into sample blocks and a random selection of these blocks was taken. Within each of the selected blocks every third household was sampled giving a total of 501 households which represented 3.4 percent of all private dwellings in Darwin. This compares with the total of 6000 households (Department of Primary Industry, op cit, p.75) interviewed in the capital cities survey which comprised less than 0.5 percent of all households in the population.

A team of four interviewers with previous survey experience were trained to conduct the survey. Interviewing was conducted throughout the week and at all times throughout the day. Interviewers were instructed to make up to five calls at varying times of the day and on different days of the week to each household selected. If after the fifth call no contact was made with the householder, the household located immediately to the right of the one selected was used as a replacement. The same principle was applied in the case of a non-response.

Interviews were conducted with the person responsible for the purchase of seafood or with knowledge regarding the purchase and or preparation of seafood in the household. Only persons who had lived in Darwin for a period of more than six months would usually be expected to establish this routine of household purchasing patterns.

Most households were very responsive to the survey and the rate of non-response was therefore minimal (0.5%). In a couple of ethnic households interpretation via the children was required - the respondents still being very cooperative. The questionnaire was administered on a person to person basis in order to avoid ambiguity in interpretation of the questions. All questionaires were edited twice (at Darwin and then at Townsville) prior to computer analysis to minimise errors in interviewing or coding.

In addition to the sample household interviews, further interviews were conducted by the researcher of varying ethnic groups - particularly smaller communities that

may not have had adequate representation in the sample. A comprehensive and up to date list of migrants was made available by the Migrant Resource Centre of Darwin. These interviews were conducted via personal visits to either the household or the workplace of the individual concerned. In a few instances telephone interviews were made where direct contact was difficult. These interviews were useful to establish demand of select market segments within the Darwin urban area.

Another sub-group of the population that was sampled in addition to the main survey was the Bagot aboriginal community of Darwin. This group was identified separately since their seafood consumption and purchasing behaviour was quite different from that of the other sample households.

The researcher also constructed personal interviews with retailers and wholesalers of seafood in Darwin in order to establish supply conditions in the marketing of seafood.

2.2 QUESTIONNAIRE DESIGN

Since there is much ambiguity associated with the term seafood, in this research 'seafood' has been defined to include both fish and shellfish species. 'Fish' refers to all species of fresh water and sea water fin fish including sharks, rays and eels. 'Shellfish' refers to all species of crustaceans, molluscs and echinoderms.

For the purpose of the research seafood was divided into four categories and referred to as 'forms' of seafood - fresh, frozen pre-packaged, smoked/cured/ dried and canned. Fresh included seafood that was freshly caught and that which had been stored in ice, or frozen and thawed for retail sales. Frozen pre-packaged included all seafood processed and pre-packaged in cardboard cartons, including fish fingers. Smoked/cured/dried seafood included such products that came in packets, packages, bottles etc. excluding tins. Canned products included all seafood products that were retailed in tins. It must be further noted that 'household consumption' in this research refers exclusively to human consumption as opposed to consumption of seafood by household pets.

The questionnaire was divided into six parts and an introduction. In the introduction general information was sought on consumers and non-consumers of seafood. Among the consumers a distinction was made between the consumption of different forms of seafood. Parts I to IV dealt with the different forms of seafood. For each form of seafood, the following information was recorded:-

* reasons for non-consumption of a particular form of seafood;

* major species consumed within a household;
* source(s) of purchase;
* weight of an average serving of seafood;
* frequency of consumption;
* day of the week seafood was eaten;
* meal at which it was consumed;
* complaints of consumer households.

Respondents indicated several reasons for non-consumption. For the convenience of computer analysis these reasons were broadly grouped into nine categories as follows:

i) prefer only fresh seafood (this would include those households that catch their own fish as well as those who receive or purchase only fresh seafood);

ii) poor packaging and presentation (e.g. the nauseating smell of some cured/smoked products and the inappropriate weights of some packages);

iii) poor quality and taste (e.g. too greasy, iodine taste, dislike of chemical smoking etc.);

iv) high price;

v) unavailability (e.g. source of supply being located too far from individual household, unavailability of species required);

vi) suspect product (this was attributed to the possible thawing and re-freezing of the product and in the case of cured seafood fears of salmonella poisoning following on from the 'John West' incident. Some respondents were also unsure of the identification labels on the product - (i.e. a possible outcome of the 'barramundi scandal');

vii) prefer other forms of seafood (i.e. 'fresh' in preference to 'smoked' etc.);

viii) do not like seafood, prefer meat (this applied to respondents who were unfamiliar with handling seafood, not been accustomed to eating seafood, dietary reasons, allergies etc.);

ix) other (vegetarian households, consumes seafood outside own house, lack of knowledge in preparing seafood, not tasted the product at all - i.e. smoked/cured seafood, no particular reason).

This question relating to reasons for non-consumption, gave valuable information regarding the existing limitations and the possible ways of improving the seafood market in the future.

Some difficulty was expressed by respondents when asked to identify the major species (limited to a maximum of ten species) of seafood consumed within a household. This problem was partly overcome by asking the respondents to identify the species on a colour chart depicting common fish of the Northern Territory and provided by the Fisheries Division, Darwin. It was also noted that different names were used by the respondents for the same species of fish. These problems were sorted out when editing the questionnaires. If an individual species had been sold under a particular trade name, the respondent obviously used this same name for identification of the product.

Species identification was most difficult in the case of seafood eaten outside the home. However, as far as possible the original names (common names) given by the respondent have been used in this report. This question helped to determine the general availability of seafood species in the Darwin market.

Purchase sources of the different forms of seafood were identified ranging from the supermarket, speciality fish shop, neighbourhood store, friends and relatives, mobile van and even the butcher. This question gave valuable information regarding the supply characteristics of seafood in Darwin. It identifies problems of store location and accessibility of the product.

Information on the weight of an average serving of fish or shellfish within a household together with the monthly consumption frequency was used to calculate the per capita consumption of seafood in Darwin. Where it was not possible to record exact 'weights' of the product, information was gathered in terms of 'pieces' or 'portions' of fish or shellfish and converted to weight in grams.

Respondents were also asked to recall the day of the week and the meal during which seafood was served. The rate of recall on these two questions was quite low. However a pattern was established from the answers received as indicated in Tables 38, 39.

Since the research was designed towards the future improvement of the seafood market, a question was asked regarding the general level of satisfaction among the Darwin consumers. Owing to the multiplicity of replies, here too responses were grouped into six categories as follows:

i) poor packaging and presentations (e.g. insufficient variety, packages too large or too small, unhygienic packing);

ii) poor quality, taste and smell (e.g. freezer burnt, over crumbed, no food value, tough and old, bony, oily, salty, stale product);

iii) high prices (including price fluctuations);

iv) unavailability of species (preference for imported products);

v) suspect product (false labelling or identification, preservatives, contamination through constant thawing, botulism, mercury poisoning);

vi) other (store location).

Recreational fishing was considered an important aspect of seafood consumption. Therefore in Part I of the questionnaire characteristics pertaining to the fishing activity of the household were recorded. Questions relating to frequency of fishing trips, average catch per trip, species caught, area of fishing, fishing experience and the extent of subsistence or commercial fishing activity of the household were included. Since there is no official record of amateur fishing activity this data will be of great importance in the planning of the industry.

In order to aid the marketing of seafood, a question relating to purchase preference was included in Part I. That is whether the consumer preferred to purchase seafood in the form of fillets, whole, gutted and scaled, headless, cutlets or had no particular preference.

Part V of the questionnaire examined general consumption characteristics including some attitudes to consumption. It was necessary to find out how many people within the household did not consume seafood, since this affected the calculation of per capita consumption. The preparation of seafood was another important aspect affecting consumption. Therefore information was gathered on the different methods of cooking seafood at home.

In order to facilitate future planning, it was found necessary to find out the favourite seafood of the household. A maximum of two species only was to be recorded in this question. Often there was a difference between the favourite seafood of the household and that which was most frequently consumed by the household. The discrepancy was a result of unavailability, high price, and the prestige factor attached to some species. Another question included to test the market potential for seafood, was the willingness of the consumer household to try out new species. Here, only the general attitude of the household was recorded and not the individual species desired.

Since seafood could also be consumed outside the house, consumption at restaurants and takeaway outlets was noted. The latter category included fish and chip shops, snack bars, takeaway Chinese food shops and any other fast food retail outlet. A seafood meal eaten at a club or pub was classified as a restaurant meal. Information pertaining to species consumed and frequency of consumption at these places was recorded.

Owing to the recent reporting of ciguatera poisoning and the general public awareness of this problem a question was asked from all participating households on the effect of ciguatera on their seafood consumption habits. In addition the researcher conducted separate interviews with consumers who were known to be ciguatera victims. These findings are reported in the section on attitudes to consumption.

Finally, Part VI dealt with demographic and socio-economic variables as listed below:

i) dwelling type;

ii) household composition;

iii) number of persons per household;

iv) number of persons employed per household;

v) highest level of education achieved;

vi) religious groups;

vii) ethnic origin.

Data was recorded for each individual member of the household and then aggregated as 'household characteristics' for computer analysis. For example, in the variable household composition data was gathered in the form of age and sex for each individual member of the household. This information was used to place each household in one of the categories identified on Page 3 of Appendix I. This variable thus enabled the stage in the life cycle for each household to be determined.

The net income of each individual in the household was recorded in terms of a class interval. The median incomes of these classes were added for all members of the household to yield total household income, Page 6 of Appendix I.

Religious groups varied widely, therefore as indicated on Page 7 of Appendix I, six major categories were identified. The variable, ethnic origin, refers to the country of origin of the respondent/household and not his/her nationality. Certain identification problems

did result in this variable. There was a multiplicity of ethnic groups, a total of almost fifty different groupings when mixed marriages were included. Therefore for convenience of analysis ten major ethnic groupings were identified as listed on Page 8 of Appendix I.

CHAPTER 3. DEMOGRAPHIC, SOCIO-ECONOMIC BACKGROUND

The demographic, socio-economic background of the population is of prime consideration when analysing any consumption situation. While this section discusses the composition of each of these variables in the survey, the following sections analyse their impact on consumption and purchasing characteristics.

3.1 POPULATION DISTRIBUTION AND GROWTH

Darwin with its population of 53 938 (Australian Bureau of Statistics, 1982) has approximately 45.8 percent of the total population of the Northern Territory. The next highest, Alice Springs, has only 14.9 percent of the Territory population. Katherine, Nhulunbuy and Tennant Creek each have about 3 percent of the population. The distribution of urban centres within the Territory and their respective populations are important determinants of the marketing machinery. Compared with other capital cities, Darwin's population is only about 6 percent of that of Adelaide and Perth, and about 1.6 percent of that of Sydney. In economic terms, very broadly, this means a relatively low market potential and scarce labour.

However, in terms of the average annual rates of population growth, Darwin had the highest rate of growth (5.5%) among all capital cities of Australia. This compares with a growth rate of 1.8 percent for Adelaide, 4.1 percent for Perth and 1.2 percent for Sydney (Australian Bureau of Statistics, 1982). Thus in terms of future expansion of the market, this growth rate is very promising.

Regional variation in population growth within Darwin is an important factor when considering marketing strategies. The more recent expansion in population growth has been concentrated in the northern suburbs of Anula, Wulagi, Wagaman, Tiwi, Malak and more recently in Karama and Leanyer. At the same time a population decline may be noted in the inner city and suburbs close to the city such as Parap/Fannie Bay and Stuart Park.

3.2 URBAN-RESIDENTIAL CHARACTERISTICS

One of the demographic variables looked at in the survey was the dwelling type (Table A1, Appendix II) of the respondent. Since the survey was confined to private dwellings only, this variable was broadly categorised into 'houses' and 'flats'. While 79.4 percent of the respondents lived in houses, 20.6 percent lived in flats. These statistics compare very favourably with the 1981 Census statistics of 75.9 percent and 24.1 percent for the two respective categories. This variable has an impact on purchasing

and consumption characteristics for the household and indicates the nature of urbanization in a community. Urbanization in Darwin has been accelerated since the 1970s. Smaller living quarters and household units are a direct result of increased urbanization. A considerable proportion of the population live in caravans and demountables - the total for the Darwin Statistical Division being 3.3 percent (ibid). The latter feature emphasised the transitory character of the Darwin population. On the whole, the trend towards city living has its impact on marketing via consumption. The smaller urban family with both parents employed, living in crowded conditions has resulted in an increased demand for smaller packages and more prepared and semi-prepared food.

In today's food market a large number of items are packed in individual servings for the family that wishes to use a relatively small quantity at any one time to maintain freshness of the product. For example breakfast cereals, cheese slices and soup packets. This trend could soon be required of the seafood industry too, owing to the general perishability of the product and its greater susceptibility in a tropical environment.

3.3 HOUSEHOLD COMPOSITION

Another important demographic variable influencing consumption patterns is the stage in the life cycle determined via 'household composition' in the survey (Appendix II). Here a distinction is made between households with children and those without children.

In the former group, a further classification indicates whether the family is 'young' or 'mature'. Households without children comprise 37.1 percent of the respondents which corresponds very closely with the 1981 Australian Bureau of Statistics Census figure of 36 percent. Households with children comprised 62.9 percent of the respondents. Of these more than half the group are households having adults with one or two children. It is the latter households that would be expected to have the greatest impact on marketing.

The age groups responsible for population growth are usually between 15 and 35 years of age, which in the case of Greater Darwin is 41.5 percent. In addition, 30.2 percent of the population is between 0 and 14 years (ibid). Generally speaking, marketing innovations are more acceptable with a younger population. Therefore in Darwin undoubtedly there is much potential for increased household consumption together with the introduction of new marketing ideas.

In section 3, household composition has been related to a number of variables such as form of seafood consumed, per head consumption, and monthly consumption. These associations are examined in greater detail later on in this report.

3.4 HOUSEHOLD POPULATION

The total number of persons dwelling in a household unit was of importance to determine the volume of consumption and the per capita consumption of a household. Eighty-five percent of the households interviewed (1981 census figure for the population was 85.2%) had between 2-5 persons living in a household (Table A3). Whilst 44.5 percent of these households had between 4-5 persons, 40.5 percent had between 2-3 persons in the household. Only 1 percent of the households had more than 7 persons living in it. When recording the purchasing and consumption characteristics of a household, certain generalizations had to be made in order to overcome problems of diverse viewpoints or socio-economic variations (religion, ethnic variations) within a household. This added to the consistency of the data collected.

3.5 EMPLOYMENT AND EDUCATION

The number of persons employed per household were noted in the survey. This together with household income will indicate the purchasing power of the household.

The level of education achieved by a household (Table A5) was believed to have influenced consumption habits. From this point of view, the highest level of education achieved in the household was recorded. On the average most households (58.7%) had at least a secondary level of education with another third (35.7%) of the households having a tertiary education level. According to the 1981 census of population 63.8 percent had a secondary education and 35.1 percent had a tertiary level of education. However, it was found that with seafood consumption, education level had very little influence. What was more important was the influence of society and peer groups.

3.6 INCOME DISTRIBUTION

Income on the other hand, is a very important variable accounting for variations in consumption patterns. There are three important determinants of income allocation patterns in consumer households. They are:

i) the absolute level of income;

ii) changes in their income;

iii) the expected distribution of their income through time.

When considering the absolute levels of household income in Darwin, it can be noted that 55.9 percent of household incomes are over $18 000[1] per annum and only 7.9 percent are below $8 000 (ibid). These statistics compare very favourably with the survey statistics (Table A6). It can be seen from the latter Table that the great majority (43.1%) of household incomes were between $18 000[1] and $35 000. There was a further fifth of the sample population having an income of more than $35 000.

What is more important in terms of marketing is the proportion of the total household income spent on a particular commodity, such as seafood. From the data available (Australian Bureau of Statistics, 1978) it is noted that for all capital city households in Australia 35.16 percent of the average weekly household expenditure was spent on food. Almost a fourth of this amount, or 8.36 percent of the total household budget was spent on meat and fish. It was also noted that household expenditure on food, increases with increasing income.

Regional variation in incomes is an important determinant of market potential. For the Northern Territory, the per capita income is highest in the Greater Darwin statistical region. There are further intra-regional differences within Greater Darwin which are of prime consideration when organising marketing. When serving diverse income groups, it is necessary to adopt different marketing strategies in order to sell different forms and species of seafood. Variations in income and its effects on seafood purchases in Darwin are discussed further in chapter 6 section 1.

Changes in the real income also affect consumption patterns. Usually, for many commodities, demand rises as income rises. However, at higher income levels a smaller proportion of the total income is used on the purchase of necessities such as food, and consequently purchases of non-essentials rise. As incomes rise, consumers tend to buy more service and processing in their food products.

3.7 ETHNICITY AND RELIGION

Ethnic origin and religion are two important factors affecting food consumption. Many of the overseas born population where possible retain their original consumption characteristics and even cooking methods. If they are settled in an area in sufficiently large numbers they even tend to influence the consumption

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[1] In the Australian Bureau of Statistics figures the highest level of household income given is "over $26 000".

patterns of the local population. This is particularly true of some of the large Chinese communities living in foreign countries. In Darwin almost one-fourth (24.7%) of the total population is overseas born (Australian Bureau of Statistics, 1982). There are over thirty-five different nationalities in Darwin. For the convenience of this survey ethnic diversity was reduced to six major groups as given in Table A8. Whilst the Australian ethnic group comprised more than half the total population (53.0%), those of British origin comprised another fourth (24.0%), these two being the largest groups and having a substantial influence on the marketing of seafood. Yet, even though some of the other ethnic groups were relatively small, they comprised a distinct market segment in the seafood industry.

Religion on the other hand affected seafood consumption to a somewhat lesser degree than ethnicity. Here too, there were a large number of mixed religions in households. Therefore, in this variable too, religious diversity was confined to seven basic categories (Table A7). As expected the largest group were the Christians (60.3%). It is also noteworthy that a fourth of the sample population did not state their religion and another 8.6 percent had no religion whatsoever. Seafood consumption was found to have some marginal influence on the Catholic community, in that some Catholics substituted seafood for meat on Fridays.

CHAPTER 4. FORMS OF SEAFOOD CONSUMPTION

95.8 percent of all households surveyed in Darwin consumed some form of seafood (Table 2). This percentage is very high when compared with other capital cities of Australia. For example, Brisbane 86.1 percent, Hobart 85.6 percent, Canberra 84.5 percent, Sydney 82.2 percent, Adelaide 81.3 percent, Melbourne 81.2 percent and Perth 79.5 percent (Department of Primary Industry, 1978). The general popularity of seafood in the northern tropics of Australia is demonstrated further by the high consumption rates of most north and central Queensland urban areas, such as Bowen 98.0 percent, Mackay 96.7 percent, Rockhampton 95.0 percent, Cairns 92.0 percent and Townsville 91.0 percent (Bandaranaike, 1981).

As illustrated in Table 2, consumption of different forms of seafood varied from the fresh form, which was the most popular among consumers (90.0%), to canned seafood (84.8%), and then to the less popular forms of frozen pre-packaged (38.5%) and smoked/cured/dried (22.1%). This trend is common throughout Australia.

Whilst the demand for fresh quality seafood will always remain high, it is possible that the demand for some of the other forms of seafood may change in the future as a result of changing life styles and competition from other food products. For example, in a recent survey of United States seafood consumption it was reported that consumption levels of canned seafood were falling (Australian Fisheries, August 1983). As discussed in section 1.4, it may also be likely that pre-packaged frozen seafoods could gain in popularity with increasing urbanization and greater female participation in the workforce.

TABLE 2: Consumption of Different Forms of Seafood

FORM OF SEAFOOD	COUNT	% OF ALL HOUSEHOLDS (n = 501)	% OF ALL HOUSEHOLDS (n = 480)
Fresh	432	86.2	90.0
Frozen pre-packaged	185	36.9	38.5
Smoked, kippered, cured, dried	106	21.2	22.1
Canned	381	76.0	79.4
Takeaway	407	81.2	84.8
All Forms	480	95.8	100.0

Relatively large numbers of households, 81.2 percent of all households interviewed, consumed seafood outside the home at restaurants or takeaway food outlets. From the point of view of organising the institutional market for seafood, these participating household numbers are of great significance. In most developed countries the trend is for increasing numbers to consume food outside the home. This characteristic is discussed in further detail in chapter 9.

Consumption frequencies of different forms of seafood are given in Table 3. Fresh fish (86.3%), canned (77.5%) and fresh shellfish (71.0%) appear to be the most popular forms of seafood among all consumer households. Whilst approximately a third of the households consumed canned shellfish and frozen pre-packaged fish (including fish fingers), the other forms were less popular. This trend was much the same in the other capital cities and towns surveyed in Australia. In Darwin, however, the percentage of consumer households eating shellfish was found to be much higher than elsewhere in Australia. The popularity of fresh fish and shellfish is to be expected among most consumer households. Canned fish on the other hand, had a specific function as a lunch time meal (chapter 8 section 2), hence its popularity. These statistics illustrate that there is a definite demand for fresh seafood and a lesser demand for other forms of seafood. In order to maintain this market and to avoid substitution by other competing products such as meat and poultry, it is important that the Darwin consumers are guaranteed a continuous supply of fresh quality seafood.

TABLE 3: Consumption Frequencies of Different Forms of Fish and Shellfish

FORM OF SEAFOOD	ABSOLUTE FREQUENCIES	% OF ALL CONSUMER HOUSEHOLDS
Fresh fish	414	86.3
Fresh Shellfish	341	71.0
Frozen Pre-Packaged fish	177	36.9
Frozen Pre-Packaged Shellfish	50	10.4
Smoked/Dried Fish	102	21.3
Canned Fish	13	2.7
Canned Shellfish	186	38.8

As illustrated in Tables B1 and B6 of Appendix II, demand for different forms of seafood varies depending on certain socio-economic variables such as income, household composition, number employed in the household, religion and ethnic origin.

Table B1 illustrates that seafood consumption in general is more frequent among the higher income classes of $18 001 and above. In fact, the middle income group of $18 001 to $35 000 had the highest percentage of households (99.7%) consuming any form of seafood, followed by the next highest income group of $35 001 to $75 000 (95.9%). However, even in the lowest income class (less than $8 000) seafood was consumed by 91.7 percent of the households. More detailed variations in the form of seafood consumed and its relation to income classes is illustrated in Table B2. Among the lowest income group (less than $8 000) all households sampled consumed fresh seafood, whilst in the other income groups this proportion varied from 87.2 percent to 93.5 percent. This high consumption rate of fresh seafood among the lowest income group is mainly due to the fact that a large number of these households are engaged in amateur fishing and/or receive fresh seafood from friends and relatives. This is supported further by the very low consumption rates of frozen pre-packaged (9.1%) and smoked/cured/dried (9.1%) seafoods in this income group. Compared with the other income classes, those households with an income of less than $8 000 also consumed the least proportion of canned seafood (45.5%) and had a low frequency of eating outside the home (63.6%). These characteristics clearly reflect the effect of income on food purchasing.

There was no significant difference in the variations of form of seafood consumed in households having an income of more than $8 000. Among these groups, whilst fresh seafood was the most popular form, food from restaurants and takeaway outlets had the second highest patronage. It is interesting to note that in the very high income group (more than $35 000) the percentage of households consuming different forms of seafood was proportionately lower than in those income classes immediately below it (between $8 001 and $35 000). This could be indicative of the fact that as incomes rise a smaller proportion of the total income is used on the purchase of necessities, and consequently purchases of non- essentials rise. Further, as incomes rise, consumers tend to buy more service and processing in their food products. If this is not being offered in the marketing of seafoods, then after a certain level of income there could be the danger of declining demand.

Another feature of the highest income group ($35 000) was that a relatively smaller proportion of households (79.5%) were using takeaway outlets. This is partly a result of data aggregation and classification adopted in this table. That is, restaurants and takeaway outlets were both identified under the category 'eating out'. Since very few from the highest income group patronised fish and chip shops, the percentage shown under 'eating out' was low, whilst in reality the frequency of dining out at restaurants was quite high for this same group.

When examining the relationship between form of seafood consumed and the total number of persons employed in a household (Table B3) a distinct relationship is apparent. As would be expected the proportion of households consuming all forms of seafood, with the exception of frozen pre-packaged seafood, increased with increasing number of persons being employed per household. For example, in those households where five or more persons were employed, all households sampled in this category consumed seafood outside the home, whilst only 85.2 percent of those households where only one person was employed consumed seafood outside the home. This table should be analysed together with Table B2 since the total household income is a more appropriate variable to assess purchasing power of the household than total number of persons employed per household.

Table B4 illustrates the form of seafood consumption by household composition. Whilst there was no significant difference between the different classes, a few variations were noted as follows. Among 'single adults' 'eating out' (92.0%) was more popular than the consumption of fresh seafood (80.0%) at home. Among the other groups of households, consumption of fresh seafood at home was the most popular, followed by 'eating out'. Households with 'adults and more than two children' had a relatively high proportion (92.2%) of 'eating out' mainly in the form of fish and chips. Another characteristic feature of households having children was the popularity of fish fingers. 51.5 percent of households comprising adults with more than two children consumed frozen pre-packaged seafood, mainly in the form of fish fingers.

When examining the influence of the country of ethnic origin on the form of seafood consumed, it can be seen from Table B5 that the popularity ratings in the forms of seafood consumed among these diverse groups was much the same, with the exception of the Asian ethnic group where there was a slightly higher preference rating for smoked/cured/dried seafood. In most Asian countries dried or cured seafoods are a common accompaniment of the daily diet. In Australia, the consumption of the latter products will be less owing to scarcity in

supply. The percentage values given in the category 'other' should be treated with some caution since the sample numbers are relatively small in this group. This applies to Table B6 too. Asians have the lowest percentage of households (63.0%) 'eating out'. This could be attributed mainly to their traditions of eating meals together as a family at home. The ethnic group 'European' comprises West European and East European communities. In smoked/cured/dried seafood consumption there is a distinct difference between these two sub groups. Whilst only 14.3 percent of West Europeans consumed the latter form of seafood, 80.0 percent of East Europeans, consisting mainly of Greeks and Italians, consumed this same form.

Religion as an attribute was also seen to have some marginal effects on forms of seafood consumption (Table B6). Among the non-Christians the incidence of 'eating out' was lower (50.0%) than in any other religious grouping. This segment is part of the same households identified as 'Asian' in Table B5. It is noteworthy that all households (100.0%) in this same non-Christian segment of the sample, consumed fresh and canned seafood and only a fourth (25.0%) of the households consumed frozen pre-packaged seafood (35.0%) and (25.0%) consumed smoked/cured/dried seafood. Since the 'non-Christian' group comprises a mix of Buddhists, Hindus. Muslims and Hebrews, religious taboos cannot be identified clearly. With the exception of the characteristics pertaining to 'eating out' and the consumption of smoked/cured/dried seafood, the 'Greek Orthodox' religious group resembled the 'non-Christian' group in the proportion of households consuming each form. That is, while 100.0 percent of the Greek Orthodox households consumed fresh seafood, 95.7 percent consumed canned and 21.7 percent frozen pre-packaged (non-Christian, 25.0%) seafood. Whilst approximately a fourth of all other households consumed seafood in cured/dried/smoked form, only 8.7 percent of the Greek Orthodox households consumed the latter form of seafood. Unlike in the consumption of meat, since there are no real religious taboos associated with the consumption of seafood, religion as an attribute had very little influence on the form of seafood consumed. Catholic households, if any, were the only group which affected seafood consumption favourably. This is discussed more fully in chapter 8 section 1.1.

CHAPTER 5. NON-CONSUMPTION OF SEAFOOD

Only 4.2 percent of all households sampled did not consume any form of seafood (Table 4). Among the other capital cities, approximately 12 percent of the households never consumed any form of fish or shellfish (Department of Primary Industry, 1978, p.16). In North and Central Queensland, these figures varied between 0 percent and 18 percent (Bandaranaike, 1981, p.25).

TABLE 4: Non-Consumers of Different Forms of Seafood

FORM OF SEAFOOD	COUNT	% OF ALL HOUSEHOLDS (n = 501)	% OF ALL HOUSEHOLDS (n = 480)
Fresh	48	9.6	10.0
Frozen pre-packaged	295	58.9	61.5
Smoked, kippered, cured, dried	374	74.7	77.0
Canned	99	19.8	20.6
Takeaway	73	14.6	15.2
All Forms	21	4.2	-

There were higher proportions of households not consuming particular forms of seafood. More than three quarters (77.0%) of all consumer households did not consume smoked/cured/dried seafood products, and nearly two thirds (61.5%) did not consume frozen pre-packaged seafood. In the capital cities survey, the average for all cities was 61.9 percent for smoked fish and approximately 50.4 percent for frozen pre-packaged seafood, (DPI, op cit, p.16) thus establishing a similar pattern.

Table 5 below, gives the individual breakdown for different forms of fish and shellfish. From this, it can be seen that the least consumed product is smoked shellfish (97.3%) such as smoked oysters, followed by frozen pre-packaged shellfish (89.6%) such as frozen prawns. When comparing the percentage of non-consumers of seafood in Darwin with that of the other state capitals, it can be seen that the distribution is somewhat similar except in the case of fresh shellfish.

TABLE 5: Non-Consumers of Different Forms of Fish and Shellfish in Darwin and Other State Capitals

FORM OF SEAFOOD	% OF ALL NON-CONSUMER HOUSEHOLDS (a) DARWIN	(b) OTHER STATE CAPITALS
Fresh fish	13.7	18.0
Fresh Shellfish	29.0	45.3
Frozen Pre-Packaged fish	63.1	62.0
Frozen Pre-Packaged Shellfish	89.6	83.8
Smoked/Dried Fish	78.8	61.9
Smoked Shellfish	97.3	n.a
Canned Fish	22.5	12.8
Canned Shellfish	61.3	65.9

Darwin householders appear to be larger consumers of fresh shellfish than elsewhere in Australia. This could partly be attributed to the abundance of prawning grounds in the north and partly to the cosmopolitan population of Darwin.

In 10.2 percent of the consumer households there were some members who did not consume either any seafood or some forms of seafood. It was necesary to record these numbers for the purpose of calculating accurately the per capita consumption of households (Table 6).

Several reasons were given by the respondents for non-consumption of any form of seafood. For convenience of analysis these reasons have been grouped. However, for the benefit of seafood promoters the categories given in Table 7 are discussed more fully in this report.

TABLE 6: Frequency of Persons in Consumer Households Not Consuming Seafood

NO. OF PERSONS	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
One	32	62.7
Two	15	29.4
Three	4	7.8
TOTAL	51	100.0

TABLE 7: Reasons for Non-Comsumption of All Forms of Seafood

REASONS	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
Poor quality and taste	2	9.5
Prefer meat, don't like seafood	12	57.2
Other	7	33.3
TOTAL	21	100.0

It was found that the majority of non-consumers didn't like seafood owing to the fact that they were not accustomed to eating seafood at home (57.2%). In some instances, if those who made the decision to purchase food in the household dislike seafood, then seafood was never served in that household. In other instances a dislike for seafood had developed during childhood, perhaps owing to faulty preparation or the presence of a large number of bones etc. In this same group there were others who preferred meat to seafood consumption. In the latter group too, there is the possibility that the original introduction of seafood in their diet was faulty. A third of this group (33.3%) had 'other' reasons for non-consumption, mainly dietary reasons. A large number of these households were vegetarians or some members of the household were allergic to several species of seafood, or, some others complained of the nauseating smell and disliked preparing it, a few had 'no particular reason' for non-consumption. Proper consumer education should overcome most of these problems.

Approximately a tenth of the households (9.5%) did not consume seafood because of poor quality of the product in retail shops and the non-availability of fresh seafood. This aspect should be taken more into consideration by the suppliers or retailers of seafood.

The research also analysed reasons for non-consumption of different forms of seafood as summarized in Table 8.

There was quite a significant proportion of non-consumers of fresh seafood (52.0%) who preferred other forms of seafood. There was also another section (41.7%) of this group who disliked seafood and preferred meat instead. Some of the reasons given for this were related to the diet, or development of allergies. Even though those two sub-groups comprised only 5.5 percent of all non-consumers of different

forms of seafood, as far as the promotion of the fishing industry is concerned this is an important segment of the population that has to be convinced of the advantages of consuming fresh seafood.

TABLE 8: Percentage Distribution of Reasons for Non-Consumption of Different Forms of Seafood

REASON FORM	FRESH	FROZEN PRE-PACKAGED	SMOKED, CURED, DRIED	CANNED
Catch own, prefer only fresh seafood	-	80.3	43.9	100.0
Poor Packaging and presentation	-	17.3	1.1	-
Poor quality and taste	-	3.4	31.3	-
Price too high	2.1*	2.4	2.7	4.0
Unavailability	-	-	2.1	2.0
Suspect product	-	5.8	-	-
Prefer other forms of seafood	52.0	-	-	-
Prefer meat, don't like seafood	41.7	2.7	1.6	-
Other	4.2	9.2	28.1	21.2

* Expressed as a percentage of all non-consumers in each form.

Under 'other', the main reasons given were related to accessibility of fish supplies. Whilst some complained of inadequate knowledge of fish shops to purchase their requirements, some others reported 'the seafood shop was closed when returning after work'. It should also be noted that 'price' was never a major factor inhibiting consumption.

80.3 percent of non-consumers of frozen pre-packaged seafood did not like any kind of frozen food because they either caught their own fish or preferred to consume fresh seafoods only. Most of the reasons for non-consumption here, were related to aspects of

retailing the product. For instance 17.3 percent disliked the batter and crumbs of the product, found it tasteless and were displeased with the presentation of the product. 3.4 percent were unsure of the quality of the product sold in the retail shops because of inadequate refrigeration control and a few others suspected the labelling and contents of the package. 5.8 percent of these non-consumers believed there were too many preservatives added to the product and resented the high cholesterol levels. Another 3.4 percent were discontented with the taste of the product - such as 'iodine taste', stale fish fingers and the overall poor quality of the product sold.

It is apparent from the reasons given above that one of the major areas requiring immediate attention is the proper storage of frozen seafood products. Most of the reasons given were clearly related to inadequacies in refrigeration. The main reason (43.9%) for non-consumption of smoked/dried/cured seafood was once again a preference for fresh seafood. There was a sub-group (31.3%) of consumers who disliked the smell, the appearance and taste of the product. There were misconceptions in this group, such as 'anything smoked caused cancerous cells', 'chemical smoking is a health hazard' etc. A few in this group admitted they consumed the product 'down south', but not in Darwin owing to either poor quality or required species being unavailable. On the retail side a few complaints related to the display of the product, a typical comment being 'if I don't see the product displayed prominently, I don't buy it'. Under 'other' reasons (28.1%), there were quite a few consumer households which admitted they either did not know how to prepare the product for consumption or had not even thought of buying it - the comment being 'can't be bothered'.

It is obvious from the above reasons that the promotion of smoked/dried/cured seafood requires a different approach from that of other forms of seafood - that is, to promote a greater acceptance of the product through possible innovations in the taste and presentation of the product, together with consumer education.

All non-consumers (100.0%) of canned seafood products stated they preferred fresh seafood. There were interesting comments in this section, such as 'only cats eat canned seafood'. 21.2 percent of this sub-group did not consume canned seafood within the household because either certain family members would not eat it or they ate outside the home. A very small proportion (2.0%) of non-consumers complained of unavailability, e.g. 'Ally' brand of seafood products, 'pilchards in sauce' etc. The latter complaint should be considered more as a local event related only to certain neighbourhoods within Darwin. In general, the researcher observed that the range and availability of canned seafood within Darwin was far better than most other towns of Australia.

CHAPTER 6. CONSUMPTION FREQUENCIES

Chapter 4 indicated the total number of households consuming different forms of seafood. The following section gives further details on frequencies of consumption, such as consumption per month, the weight (in grams) of an average serving of seafood at home, and the annual per capita consumption.

6.1 CONSUMPTION PER MONTH

The total number of times a household consumed seafood, poultry or meat at individual meals were recorded for each household. These statistics are given in Tables 9-18. It must be noted that these frequencies are calculated as percentage of all households consuming that particular form of seafood, poultry or meat. Where relevant, comparisions have been made in the text with all households in the sample - i.e. 501 households.

6.1.1 FORM OF CONSUMPTION

It can be seen from these Tables that meat consumption had by far the highest monthly frequency. Almost half (48.6%) the households consuming meat, had an average monthly consumption of between 15 and 20 times. 89.1 percent consumed meat more than 11 times per month. A small but significant proportion (4.6%) consumed meat at more than one meal a day, giving a frequency of more than 30 times per month. Only 4.2 percent of the households served meat less than 6 times per month (Table 18). This data clearly supports the high degree of popularity of meat in the Darwin household.

Although the monthly consumption of poultry was also higher than that of seafood in general, its popularity over seafood was not as distinct as that of meat. Poultry, with an average monthly consumption of 3-4 times per month, had only a marginally higher consumption than that of seafood.

TABLE 9: Monthly Consumption of Fresh Fish

MONTHLY FREQUENCY	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
<1	58	14.0
1-2	154	37.2
3-4	127	30.7
5-6	33	8.0
7-10	26	6.3
11-14	12	2.9
15-20	2	0.5
21-25	1	0.2
26-30	0	0.0
>30	1	0.2
TOTAL	414	100.0

TABLE 10: Monthly Consumption of Fresh Shellfish

MONTHLY FREQUENCY	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
<1	117	34.3
1-2	163	47.8
3-4	44	12.9
5-6	10	2.9
7-10	2	0.6
11-14	3	0.9
15-20	1	0.3
21-25	1	0.8
TOTAL	341	100.0

TABLE 11: Monthly Consumption of Frozen Pre-Packaged Fish

MONTHLY FREQUENCY	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
<1	50	28.2
1-2	91	51.4
3-4	29	16.4
5-6	5	2.8
7-10	1	0.6
11-14	1	0.6
TOTAL	177	100.0

TABLE 12: Monthly Consumption of Frozen Pre-Packaged Shellfish

MONTHLY FREQUENCY	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
<1	30	60.0
1-2	16	32.0
3-4	2	4.0
5-6	2	4.0
TOTAL	50	100.0

TABLE 13: Monthly Consumption of Smoked Fish

MONTHLY FREQUENCY	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
<1	44	43.1
1-2	51	50.0
3-4	5	4.9
5-6	1	1.0
15-20	1	1.0
TOTAL	102	100.0

TABLE 14: Monthly Consumption of Smoked Shellfish

MONTHLY FREQUENCY	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
<1	7	53.8
1-2	6	46.2
TOTAL	13	100.0

TABLE 15: Monthly Consumption of Canned Fish

MONTHLY FREQUENCY	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
<1	71	19.1
1-2	182	48.9
3-4	84	22.6
5-6	12	3.2
7-10	12	3.2
11-14	8	2.2
15-20	3	0.8
TOTAL	372	100.0

TABLE 16: Monthly Consumption of Canned Shellfish

MONTHLY FREQUENCY	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
<1	91	48.9
1-2	63	33.9
3-4	19	10.2
5-6	6	3.2
7-10	3	1.6
11-14	4	2.2
TOTAL	186	100.0

TABLE 17: Monthly Consumption of Poultry

MONTHLY FREQUENCY	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
<1	6	1.4
1-2	93	21.5
3-4	196	45.4
5-6	28	6.5
7-10	74	17.1
11-14	22	5.1
15-20	13	3.0
TOTAL	432	100.0

TABLE 18: Monthly Consumption of Meat

MONTHLY FREQUENCY	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
<1	3	0.7
1-2	4	0.9
3-4	9	2.1
5-6	2	0.5
7-10	30	6.8
11-14	48	11.0
15-20	213	48.6
21-25	63	14.4
26-30	46	10.5
>30	20	4.6
TOTAL	451	100.0

Two-thirds (66.9%) of these consumers had a frequency of between 1 and 4 times per month. Another 3.0 percent consume poultry between 15 and 20 times per month (Table 17). This compares with two-thirds (67.9%) of the consumers of fresh fish having a monthly frequency of between 1 and 4 times, together with 3.6 percent of these consumers having an average frequency of more than 11 times per month. Thus the difference in the frequencies of consumption between poultry and the most popular form of seafood (i.e. fresh fish) in Darwin, is minimal.

The different forms of seafood may be grouped into three categories based on similar monthly consumption frequencies.

Group I: fresh fish, canned fish: 1-2, 3-4 times per month;

Group II: frozen fish, fresh shellfish, smoked fish: 1-2, 1 times per month;

Group III: frozen shellfish, smoked shellfish, canned shellfish: 1, 1-2 times per month.

It was noted earlier (Table 3) that fresh fish was consumed by a larger number of households than canned fish. Yet, the percentage of households consuming canned fish with a monthly frequency of 1-2 times per month was higher (37.9%)[1] than for fresh fish (32.1%). The equivalent relative frequencies for these are canned fish 48.9 percent[2] (Table 15) and fresh fish 37.2 percent (Table 9). Altogether well over half the householders in Darwin consume fresh fish (58.5%) and canned fish (55.4%) at a frequency of between 1 and 4 times per month.

Therefore, even though apparently there are more households consuming fresh fish, it should be noted for purposes of marketing that consumption frequencies are slightly higher in the case of canned fish than fresh fish. It is necessary to investigate through further research whether this pattern is a reflection of availability of the product or established consumption patterns.

In the Capital Cities Survey (DPI, 1978, p.16) canned fish had the highest frequency of consumption followed by fresh fish, thus establishing a similar pattern to that of Darwin. Frozen pre-packaged fish, fresh shellfish and then canned shellfish were the next most popular followed by smoked fish and shellfish. Minor differences in relative importance of the different forms of seafood, between Darwin and the other capital cities are evident.

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1 Note, these percentages are calculated on a base of 480, which is the total number of seafood consumers in the sample.

2 These percentages are calculated on the total number of households consuming each form of seafood - i.e. 372 for canned fish, 414 for fresh fish.

In the second group of seafoods, it can be seen that 51.4 percent of frozen pre-packaged fish consumers (or 19.0% of all consumers), 50.0 percent of smoked fish consumers (or 10.2% of all consumers), and 47.8 percent of fresh shellfish consumers (or 34.0% of all consumers) had a consumption rate of 1 to 2 times per month. It should be noted that in the case of frozen pre-packaged shellfish, some households (0.3%) consumed up to 21-25 times per month, thus indicating a small group of consumers having a slightly higher average consumption frequency than the rest in this sub-group.

In the third group of seafoods, 60.0 percent of frozen pre-packaged shellfish consumers (or 6.3% of all consumers) had a modal frequency of less than once a month. 53.8 percent of smoked shellfish consumers (or 1.5% of all consumers) and 48.9 percent of canned shellfish consumers (or 19.0% of all consumers) had the same monthly consumption frequency as above. Among the canned shellfish consumers, there were 3.8 percent in this sub-group with an average consumption frequency of between 7 and 14 times per month, thus establishing the greater popularity of this form within group three.

The above analysis shows that the two most popular forms of seafood (fresh fish and canned fish) had equally high consumption rates. Fresh shellfish which was consumed by 71.0 percent of households and the third most widely consumed form of seafood in Darwin, had a monthly consumption rate lower than fresh or canned fish. This is probably a reflection of availability of the product or of a relatively high price. In contrast, smoked/dried fish which was consumed by only 21.4 percent of households in Darwin (sixth most popular form of seafood), was eaten as frequently as fresh shellfish. This indicates that among the few households eating smoked/dried fish, consumption frequencies are relatively high. In the case of frozen pre-packaged shellfish and smoked shellfish, frequencies of consumption per month were low and so were the total numbers of households consuming the product, thus establishing its lesser popularity.

In order to gain similar frequencies of consumption to that of meat, there has to be a great deal of effort expanded both via consumer education and availability of retail supplies.

6.1.2. HOUSEHOLD SIZE AND COMPOSITION:

The relationship between monthly consumption frequencies and select demographic and socio-economic variables are examined below. The two variables, household number and household composition were found to be related closely. Therefore when interpreting patterns of consumption these two variables are analysed together. It can be seen from Tables C1 to C8

in Appendix II, that different forms of seafood were favoured by households with varying numbers of persons living in them. For example, in the consumption of fresh fish, 47.1 percent comprised households with 4-5 persons and 38.4 percent, households with 2-3 persons. These sub-groups also had some of the higher rates of consumption - viz 15-20 and 30 times per month. Tables C11 to C18 illustrate that these sub-groups had either a household composition of adults with 1 or 2 children, or an adult group.

The sub-groups, adults with 1 or 2 children and single adults had modal frequencies higher (3-4 per month) than the rest. This is particularly noteworthy in the latter sub-group since even though only 9.7 percent of the households belonged to this group, 52.5 percent of these consumers had a consumption frequency higher than the modal frequency for this variable (1-2 per month).

In the consumption of fresh shellfish the same sub-groups as above had high rates of consumption. In this form of seafood consumption, adults with more than two children had a lower modal frequency (1 per month) than the other groups in this variable (Table C25). This implies higher consumption frequencies of fresh seafood among relatively smaller households.

Households with 2-3 persons in addition to their high consumption frequencies of fresh fish, were also found to favour smoked shellfish (Table C7). These households were usually comprised of adults with 1 or 2 children or adult groups.

Households with one person or with single adults were most favoured toward the consumption of canned shellfish and pre-packaged shellfish. In both these forms of consumption there were only about 10 percent of households in each, belonging to these sub-groups. The category, adult groups had the second highest frequencies of consumption in both canned shellfish and frozen pre-packaged shellfish. In the latter form of seafood, 80 percent of the households comprising single adults had a consumption frequency of 1-2 per month (Table C16).

In canned fish, high consumption frequencies (11-14 per month) were found in households with one person or single adults as well as households with 6-7 persons of adults with more than two children. On the average, these households comprised only about a tenth of all consumers of canned fish, but over a third of these same households had consumption frequencies of more than three times per month (Tables C4 and C14).

Households with 4-5 persons or mixed groups had relatively high rates of consumption in smoked fish and frozen pre-packaged fish. In the case of the latter

form of seafood, the sub-groups, 6-7 persons or adults with more than two children also had high frequencies (Tables C2 and C12).

In the case of poultry and meat consumption, frequencies were distributed fairly evenly through all sub-groups. However, marginally higher consumption frequencies were seen in households with 4-5 persons and 6-7 persons (Tables C9 and C10). This corresponded to sub-groups, adults with one or two children and adults with more than two children.

Thus for purposes of market segmentation, the stage in the life cycle (indicated through household composition and household number) should be noted and the individual preferences of each sub-group taken into consideration together with the proportion of households favouring a particular form of seafood as discussed in the above section.

6.1.3. ETHNIC ORIGIN AND RELIGION

As in the case of household number and household composition, similar relationships were seen between the two variables ethnic origin and religion. However, it must be noted that all persons in an individual ethnic group did not belong to the same religion and vice versa. Also the group 'Other' in country of ethnic origin and the groups 'Not stated' and 'Other' in the variable, religion, could not be included in the analysis owing to the mixed composition of these sub-groups.

Overall, in the consumption of seafood, even though the total number of Asian households sampled was relatively small (owing to its smaller representation in the population), the monthly consumption frequencies in most forms of seafood were higher than the modal frequency. For example, this was the case in all forms of seafood except frozen pre-packaged shellfish and smoked shellfish. The Australian group on the other hand had large numbers of households consuming the different forms of seafood, but it had only a few households with higher consumption frequencies. This Australian group in general had some of the highest frequencies of consumption in fresh fish.

The British sub-group appeared to have high frequencies in distinct forms of seafood - viz, frozen pre-packaged fish and shellfish, canned fish and shellfish. Those with a European ethnic origin, had relatively high consumption rates in smoked fish. Further details of these broad patterns are discussed below with reference to Tables C21 to C30, Appendix II. In the case of religion as a socio-economic variable affecting frequencies there was no clear pattern as above. The latter relationship may be identified in Tables C31 to C40 Appendix II.

In the consumption of fresh fish, 65.2 percent of the Asian households and 53.7 percent of the Australian households mainly had consumption rates higher than the modal frequency class (1-2 per month) (Table C21). 54.8 percent of the Catholic households had rates of consumption higher than the modal class and up to 15-20 per month (Table C31).

50.0 percent of the Asian households once again had a consumption frequency higher than the modal class (1-2 per month) in frozen pre-packaged fish. The second highest frequencies in this form were among the British households which had 28.6 percent of their consumers with a frequency of more than three times per month (Table C22). No set pattern was identifiable among the religion groups, but it appeared that Catholics, other Christians and those with no religion had a few households with rates of consumption between 5 and 14 times per month (Table C32).

Smoked/dried fish was also popular among the Asian households - particularly dried fish such as Bombay Duck or dried sprats. Whilst 28.5 percent of Asian households had a consumption rate higher than the modal frequency class (1-2 per month), 22.2 percent of European households also had similar high rates of consumption in smoked fish such as smoked salmon or smoked cod (Table C23). In terms of religion (Table C33) this corresponded with Catholic households (11.8% above modal class) and other Christians (8.1% above the modal class).

In canned fish, 41.7 percent of British households and 40.9 percent of Asian households had consumption frequencies higher than the modal. It is also noteworthy that approximately 14 percent of Adriatic households had consumption frequencies between 7 and 14 times per month (Table C24). The sub-group other Christians had more than a third of its households with higher than the average rate of consumption (1-2 per month) (Table C34).

Even though Adriatic households comprised only 7.6 percent of all households serving fresh shellfish, 26.8 percent of these and 24.0 percent of Asian households had a monthly consumption rate which was higher than the average for that form (1-2 per month). In contrast, 47.2 percent of Australian households consumed this form, but the frequencies of consumption were relatively low (Table C25). Among the different religions (Table C35), Greek Orthodox households and Catholic households had high frequencies of consumption.

Consumption rates of frozen pre-packaged shellfish and smoked shellfish were low compared with other forms. Of the former, British households had the largest number of consumers (42.0%) and also some of the

highest frequencies of consumption (Table C26). It should be noted that British households had the highest frequencies in both fish and shellfish in frozen pre-packaged form. Whilst Catholic and other Christian households had about a third of their households with relatively high rates of consumption for this form of seafood, those with no religion had 75.0 percent of their sub-group having a modal frequency of 1-3 per month which was higher than the average for this form (1 per month) (Table C36).

In smoked shellfish, no clear patterns were visible owing to the relatively small number of participating households and low frequencies (maximum of 1-2 per month). Whilst 100.0 percent of the Australian households had a frequency higher than the modal class, there were no Adriatic households in the samples consuming this form of seafood (Table C27). No characteristic frequency pattern was evident among the different religious groups in this form of seafood (Table C37).

As in the case of canned fish, Asian and British households had some of the higher frequencies in the consumption of canned shellfish (Table C28). Sixty-six point six percent of Asian households consumed this form and 53.2 percent of British households had consumption frequencies of up to 11-14 times per month. Among the different religions (Table C38), other Christian households had some of the highest monthly consumption rates.

Poultry and meat consumption once again had high consumption frequencies amongst distinct ethnic groups. For instance in poultry consumption, 62.9 percent of Asian households had consumption frequencies above the modal class (3-4 per month) and up to 15-20 per month (Table C29). Other Christians had the largest number of households in this form of consumption with 56.1 percent of these having relatively high consumption the rates - i.e. above the modal class (Table C39).

In meat, unlike in seafood and poultry, high consumption rates were distributed evenly among all the sub-groups. Whilst a clear pattern could not be identified among the different religious groups (Table C40), 47.9 percent of European and 43.2 percent of British householders appeared to have high consumption frequencies of 21 times per month and above (modal frequency for meat 15-20 per month). The Australian group had 55.7 percent consuming meat with a frequency of 15-20 per month, but only another 20.1 percent with frequencies above that. The Adriatic and Asian households had similar frequency patterns of meat consumption to that of the Australians.

From the above discussion it is clear that ethnicity had quite a significant influence on different forms of consumption, more so than religious identity. Therefore, within Darwin the distribution of ethnic households should be noted and seafood marketing strategies adopted accordingly.

6.1.4 INCOME

Since price is an important factor in any form of consumption, income as a variable affecting monthly consumption frequencies is discussed below. It can be seen from Tables C41 to C50, Appendix II, that often households irrespective of whether they had a low income ($8,000) or a high income ($35,001-75,000) had high monthly frequencies in the same form of seafood - e.g. frozen pre-packaged shellfish. In most forms of seafood, however, households with an average income ($18,001-$35,000) and/or high income ($35,001-$75,000) had relatively higher consumption frequencies. Those households with a very high income (>$75,000) had higher than average monthly frequencies in most forms. At the other extreme, households with a very low income (<$8,000) had relatively low consumption. These characteristics are discussed in further detail below.

In fresh fish consumption, the Very Low Income group had a maximum frequency of 3-4 per month and the Average Income group a maximum of >30 per month. Even though the High Income and Very High Income groups had lower maximum frequencies than the latter group the spread over the higher frequencies was wider. That is, the High Income group had 17.1 percent of its consumers with frequencies of 7 to 10 times and above per month, Very High Income had 16.0 percent with a frequency of between 7 and 14 per month, and the Average Income group had only 6.2 percent with frequencies of 7 to 10 per month and above (Table C41).

This pattern of distribution was more or less repeated in fresh shellfish consumption (Table C45). That is, the Average Income Group had the widest distribution in monthly frequencies. The High Income and very high income groups had larger percentages of households within each group having monthly consumption rates of 3 to 4 times and above. The maximum rate of consumption for the Low Income Group once again was 3-4 per month. In the sub-group low income, there were a few irregularities in the 11 to 14 and 21 to 25 per month groups. These were more the exception than the rule.

The Very Low Income group had extremely few consuming frozen pre-packaged fish (1.1% of total consumers in this form) and these same households had very low frequencies - less than 1 per month. While the Very High Income group had 35.0 percent of its consumers with consumption frequencies between 3 and 6 per month,

the High Income Group had 22.6 percent with frequencies of between 3 and 6 per month, and another 6.4 percent between 7 and 14 per month (Table C42).

Consumption rates of frozen pre-packaged shellfish were much lower (maximum 5-6 per month) than that of frozen pre-packaged fish, and distribution characteristics different. None in the Very Low Income group consumed this form. However, 16.6 percent of the Low Income Group and 16.7 percent of the Very High Income Group had consumption frequencies of 3 and above (Table C42) thus establishing that price is not a significant factor in the consumption of this form.

In smoked fish consumption households with monthly consumption frequencies above the modal class for this form (1-2 per month) were very few. 8.3 percent in the High Income Group and 8.0 percent in the Average Income Group had frequencies above the modal class (Table C43).

In smoked shellfish consumption too, the High Income and Average Income Groups had higher monthly frequencies than the rest (Table C47). As in frozen pre-packaged shellfish, there were no consumers in the Very Low Income Group.

In canned fish consumption all sub-groups had a significant number of households having a monthly rate of consumption above the modal class (1-2 per month). The three highest income groups: average, high and very high - had monthly frequencies extending up to 15-20 times per month (Table C44).

In canned shellfish there were no consumers in the sub-group very low income (Table C48). The largest number of consuming households of this form and some of the highest frequencies (up to 11-14 per month) were in the sub-groups: average income and high income. Overall monthly frequencies of consumption for canned shellfish were lower than that for canned fish.

In poultry and meat consumption, all sub-groups had high frequencies of consumption. Approximately a fourth to a third of the households in each sub-group had monthly frequencies above the modal class. In poultry consumption it is noteworthy that the Very Low Income Group had 57.2 percent of its consumers with a frequency higher than the modal, but in meat consumption it had only 25.0 percent above the modal (Tables C49 and C50), thus indicating higher consumption of poultry in the Very Low Income Group - possibly a reflection of retail prices of the two commodities.

Summarising the situation among all forms of food consumption dealt with here, it can be concluded that price is not a major factor determining the consumption

of food. There are other more important factors like the way of life, availability and presentation of the product and some of the other socio-economic variables discussed earlier, which may have a bearing on seafood consumption characteristics.

6.2 WEIGHT OF AN AVERAGE SERVING OF SEAFOOD

This section analyses the average quantity of seafood consumed (in grams) per head, within individual households. This quantity was derived by recording the average quantity of seafood (for each form) served in a household and dividiing this by the total number of persons in that household consuming it. These statistics were later used in the calculation of the annual per capita consumption of different forms of seafood.

Table 19 illustrates that more than a quarter (27.2%) of the households in Darwin served 201-300 grams of fresh fish per meal. Another quarter of the households (26.9%) served between 101-200 grams and 41.5 percent of households served more than 300 grams per meal. This compares with an average of 168 grams served per meal, in the other capital cities, which is only about 75 percent of that served in a Darwin household (Table 19).

In fresh shellfish consumption a third of the households (33.4%) served 101-200 grams of this form per meal and a further 17.4 percent of households served between 201-300 grams. Thus in both fresh fish and shellfish more than half the households in Darwin served on an average between 100 and 300 grams of this form per meal. In shellfish, however, there was a smaller percentage of households (37.8%) than in fresh fish, consuming more than 300 grams per serving. In the capital cities the average weight of fresh shellfish served per meal was 152 grams which is similar to the Darwin average.

TABLE 19: Percentage Distribution of Fresh Fish Consumption

GRAMS (PER HEAD)	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
1-100	17	4.4
101-200	104	26.9
201-300	105	27.2
301-400	71	18.4
401-500	57	14.8
501-750	24	6.2
>750	8	2.2

TABLE 20: Percentage Distribution of Fresh Shellfish Consumption

GRAMS (PER HEAD)	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
1-100	33	11.2
101-200	98	33.4
201-300	51	17.4
301-400	43	14.7
401-500	44	15.0
501-750	14	4.8
>750	10	3.3

Frozen pre-packaged fish and shellfish were served in smaller quantities than fresh seafood. Yet, more than a quarter (29.7%) of the households served 101-200 grams of frozen pre-packaged fish per meal and a third (33.6%) of the households served 101-200 grams of frozen pre-packaged shellfish per meal (Tables 21 and 22). It is also note worthy that another third (37.2%) of the households consuming shellfish served more than 200 grams, while only a tenth (10.3%) of the households served frozen pre-packaged fish of the same quantity. Thus even though monthly consumption frequencies were lower for shellfish (chapter 6 section 1), the total quantities served per meal are higher than for fish of the same form. The information gathered here is relevant in terms of the most useful size of packaging to be developed in this form of seafood.

TABLE 21: Percentage Distribution of Frozen Pre-Packaged Fish Consumption

GRAMS	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
1-100	105	60.0
101-200	52	29.7
201-300	12	6.9
301-400	3	1.7
401-500	2	1.1
>1000	1	0.6

TABLE 22: Percentage Distribution of Frozen Pre-Packaged Shellfish Consumption

GRAMS	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
1-100	13	30.2
101-200	14	32.6
201-300	10	23.3
301-400	5	11.6
401-750	1	2.3
>1000	1	0.6

TABLE 23: Percentage Distribution of Smoked, Cured, Kippered, Dried, Fish Consumption

GRAMS	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
1-100	38	38.8
101-200	33	33.7
201-300	23	23.5
301-400	3	3.1
401-500	1	1.0
>1000	1	0.6

In comparison, capital cities served an average weight of 155 grams of frozen pre-packaged fish and only 86 grams of frozen pre-packaged shellfish.

The quantity of smoked/dried fish and shellfish served per meal by Darwin households was much less than the other forms - Table 23.

While 38.8 percent of the households served smoked/dried fish between 1-100 grams per meal, 30.0 percent of households consuming smoked shellfish, on an average, served the same quantity per meal. However, there were a further 27.6 percent of households that served more than 200 grams of smoked/dried fish per meal. There were more in this category than for smoked shellfish. In the capital cities, the weight of an average serving of smoked fish was slightly higher (120 grams) than in Darwin - Table 24.

TABLE 24: Percentage Distribution of Smoked, Cured, Kippered, Dried, Shellfish Consumption

GRAMS	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
1-100	8	80.0
101-200	2	20.0

Even though canned fish was popular among most households in Darwin and also had a monthly consumption frequency equal to that of fresh fish (P.32), the quantity served per meal was relatively low. Sixty six point seven percent of households served 1-100 grams per meal. In terms of the size of canned seafood sold in the market, this feature is very relevant. Most households would use the smaller size cans in preference to the larger cans. On the average, 68 grams of canned fish were served per meal in the capital cities, and this was therefore very similar to Darwin - Table 25.

TABLE 25: Percentage Distribution of Canned Fish Consumption

GRAMS	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
1-100	242	66.7
101-200	100	27.5
201-300	20	5.5
301-500	1	0.3

Canned shellfish as in the case of smoked shellfish was served in relatively small quantities. This could be a reflection of the size of cans available in the market - i.e. usually most canned shellfish products come in smaller containers than canned fish. Table 26 shows that 92.7 percent of Darwin households served 1-100 grams of canned shellfish per meal. In the capital cities the equivalent weight was 38 grams - Table 26.

TABLE 26: Percentage Distribution of Canned Shellfish Consumption

GRAMS	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
1-100	164	92.7
101-200	13	7.3

Thus among the different forms of seafood, weight of an average serving of seafood varied between 1 and greater than 750 grams. Some of the higher weights recorded in fresh fish and shellfish could be due to the fact that these forms are sometimes cooked whole without filleting - e.g. baked or steamed whole fish, curried prawns (usually cooked with shells), whereas in the pre-packaged, canned or bottled forms they are already filleted or cleaned. Therefore it is not unusual to find relatively higher portions, quantity wise, served in fresh fish or shellfish.

6.2.1 HOUSEHOLD SIZE AND COMPOSITION

The relationship between the weight of an average serving of seafood and select socio-economic variables are analysed next.

Table D1, in Appendix II, illustrates that in some households of 2-3 persons and 4-5 persons the per head consumption of fresh fish was quite high, a few serving even more than 750 grams per head. The above sub-groups correspond to adult groups, adults with 1 or 2 children and adults with more than 2 children in the variable household composition (Table D3). It is noteworthy that among 11.5 percent of the one person households fresh fish consumption was greater than 750 grams. This pattern is reflected in household composition too, where 7.9 percent of single adults had a consumption of more than 750 grams. The relatively high per head consumption of fresh fish is further supported by the fact that all sub-groups in Tables D1 and D3 have more than a third of their households consuming quantities greater than the modal frequency for fresh fish (201-300 grams).

From Tables D2 and D4 it is evident that the per head consumption of fresh shellfish is highest among one person, single adult households, adult groups and households with 2-3 persons. Overall more than 50 percent of all households had a per head consumption rate above the modal class in fresh shellfish consumption.

6.2.2 ETHNICITY

Ethnicity as a variable affecting the per head consumption of fresh fish is seen in Table D5. The Asians had high monthly rates of consumption (Table C21). In addition, 4.5 percent of Asian consumers ate more than 750 grams of fresh fish. Adriatic households had 10.7 percent of consumers with a frequency of between 501 and 750 grams. Overall individual variations among the different sub-groups are minimal. Differences if any, exist between different ethnic groups and forms of seafood consumed and not so much the quantity consumed. This aspect has already been analysed in the previous chapter 6 section 1.

6.2.3 INCOME

Tables D6 and D13 analyse the influence of income as a variable affecting an average serving of seafood or the per head consumption of seafood. In all forms except canned seafood the average income group ($18,001-$35,000) had some of the highest per head consumption frequencies - that is, above 500 grams in all forms except smoked seafood and frozen pre-packaged fish.

The very high income group appeared to have the second highest rates of per head consumption in fresh seafood. The former group also had the second highest frequency in the consumption of canned seafood.

The low income group had the highest per head consumption frequency in canned seafood. Whilst 1.5 percent of the households had a consumption rate of between 401-500 grams in canned fish, 25.0 percent of households had a consumption rate of between 101-200 grams in canned shellfish. In frozen pre-packaged fish too, this group had some of the highest frequencies - i.e. 2.9 percent households had a frequency of 401-500 grams.

The high income group had the second highest frequencies of consumption in frozen pre-packaged shellfish (20% consuming 301-400 grams) and smoked fish (27.2% consuming 201-400 grams).

The very low income group had 20.0 percent consuming between 501-750 grams (third highest frequency in this form) of fresh shellfish.

In summarising the above frequency patterns, it is evident that the per head consumption rate in all forms of seafood is quite low among the lowest income group of less than $8,000 (very low income). Those households with an income of between $18,001 and $35,000 (average income) apparently had some of the highest rates of per head consumption. Consumers belonging to the very high income group ($75,000) also had quite a few households with a relatively high per head consumption in most forms of seafood. However, once again, there is no clear indication that price is a significant factor influencing the quantity of seafood consumed per head.

6.3 ANNUAL PER CAPITA CONSUMPTION

Annual per capita consumption rates are important indicators of the popularity of different forms of seafood in a particular location. Also the demand for these products can be measured against the availability of local supplies. These statistics also give some indication as to the relative positioning of Darwin's seafood consumption within Australia and also on an international scale.

In the calculation of the annual per capita consumption, all seafood purchased commercially, received as gifts and caught personally were taken into account both at home and outside the home. This analysis shows that Darwin has some of the highest recorded annual per capita consumption rates in Australia. In the Tables below these statistics are compared with those of the other state capitals. It must be remembered, however, that the latter statistics refer to 1976-1977. Yet, even if a 10 percent increase in consumption is assumed between 1976 and 1982, the Darwin rates of consumption will still be much higher.

TABLE 27: Annual Per Capita Consumption of Seafood for Sample Households and Population in Darwin

FORM OF SEAFOOD	SAMPLE AVERAGE (KG)	POPULATION AVERAGE (KG)
FISH		
Fresh	13.70	11.30
Frozen Pre-Packaged	2.45	0.90
Smoked, kippered, cured, dried	2.11	0.40
Canned	3.61	1.90
SHELLFISH		
Fresh	8.65	5.90
Frozen Pre-Packaged	2.39	0.20
Smoked, kippered, cured, dried	0.87	0.02
Canned	0.90	0.30
TOTAL FISH AND SHELLFISH		20.92*

This figure is to be compared with figures in Table 28.

Frequencies of consumption analysed in chapter 6 section 1 and chapter 6 section 2 clearly support the high annual per capita consumption rates of fresh seafood - Table 27. For canned fish on the other hand, even though it had relatively high monthly rates of consumption, the quantity consumed per meal was somewhat low thus reflecting the lower per capita consumption. Frozen pre-packaged fish and smoked fish had monthly consumption rates similar to those of fresh shellfish, but it was noted that the quantities consumed in these two were far less than fresh shellfish thus resulting in lower per capita rates of consumption. Even though the monthly consumption rates

for frozen pre-packaged shellfish, smoked shellfish and canned shellfish were similar, the quantity of frozen pre-packaged shellfish consumed per head was higher than the other two, resulting in a higher per capita consumption for the latter.

The hierarchical placings of the different forms of seafood in Darwin, although different from that of the other capital cities, agreed on the four most popular forms of seafood: fresh fish and shellfish, canned fish and frozen pre-packaged fish; and the four less popular forms being: frozen pre-packaged shellfish, smoked fish and shellfish and canned shellfish.

Table 27 clearly indicated the greater popularity of fresh fish in Darwin above all other forms of seafood. The annual per capita consumption of fresh fish in Darwin was more than four times higher than that of any other Australian state capital (Table 28). Another distinguishing feature of Darwin is that fresh shellfish was the second most popular form, where as in all other state capitals, canned fish had the second highest per capita consumption. Even though the annual per capita consumption of canned fish in Darwin was less than half its fresh shellfish consumption, it was still higher than in the other capitals. In Darwin, frozen pre-packaged fish and shellfish had annual per capita rates of consumption which were more than twice those found in other capitals. Smoked/dried fish once again was much more popular in Darwin than the other capital cities. In all capital cities including Darwin, smoked/dried fish shellfish had the lowest rates of annual per capita consumption.

Except in the case of fresh fish and shellfish, the differences in weights between the per capita rates of Darwin and the rest, were on an average less than 2 kg. This difference in the case of fresh seafood on the one hand could be a real difference resulting from various underlying demand and supply factors, but on the other hand, the difference could be exaggerated owing to disparities in assessing fresh seafood consumption, mainly the contribution to consumption from non-commercial sources such as amateur fishing households.

	TOTAL (kg)	SYDNEY (kg)	MELBOURNE (kg)	PERTH (kg)	BRISBANE (kg)	ADELAIDE (kg)	CANBERRA (kg)	HOBART (kg)
FISH (At home)								
Fresh	2.90	3.16	2.71	2.70	3.49	2.49	1.80	2.50
Frozen Pre-Packaged	0.96	1.03	1.01	0.90	0.71	0.90	0.91	0.67
Tinned Fish	1.82	1.99	1.68	1.64	1.53	2.26	1.83	0.73
Smoked Fish	0.28	0.32	0.23	0.35	0.26	0.31	0.25	0.28
Sub-Totals	5.96	6.50	5.63	5.59	5.99	5.96	4.79	4.18
Cooked from takeaway outlets	1.10	1.06	1.26	1.04	1.10	0.96	0.59	0.92
Eaten outside the home	0.74	0.79	0.77	0.67	0.93	0.44	0.50	0.45
TOTAL FISH	7.80	8.35	7.66	7.30	8.02	6.36	5.88	5.55
SHELLFISH (At Home)								
Fresh	0.80	0.93	0.46	1.37	0.97	0.75	0.38	0.69
Frozen Pre-Packaged	0.09	0.13	0.06	0.07	0.02	0.13	0.07	0.09
Tinned	0.12	0.12	0.16	0.08	0.05	0.09	0.12	0.04
Other	0.02	0.01	0.03	0.01	0.04	0.03	0.05	-
Sub-Total	1.03	1.19	0.71	1.53	1.08	1.00	0.62	0.82
Cooked from takeaway outlets	0.54	0.96	0.20	0.37	0.61	0.12	0.55	0.31
Eaten outside the home	0.70	1.19	0.37	0.34	0.65	0.21	0.97	0.47
TOTAL SHELLFISH	2.27	3.34	1.28	2.24	2.34	1.33	2.14	1.60
TOTAL FISH AND SHELLFISH	10.07	11.69	8.94	9.54	10.36	7.69	8.02	7.15

Source: Department of Primary Industry, Canberra 1978

(N.B.: Some of the categories have been modified slightly from the original table, in order to conform to the Darwin data)

CHAPTER 7. SPECIES CONSUMED

In order to yield as much information as possible to the seafood marketers, the demand for various species is given here as reported in the original questionnaires. There were problems of identification of some species together with the misnaming of fish in the market. However, great care was taken to maintain uniformity in the identification of species for this report.

7.1 FRESH FISH AND SHELLFISH

Broadly, five groups of species are identified in Table 29 according to their frequency of consumption in the Darwin households:

Group I : more than 60 percent of consumers
Group II : 20-40.9 percent of consumers
Group III : 10-19.9 percent of consumers
Group IV : 5-9.9 percent of consumers
Group V : less than 5 percent of consumers.

Barramundi (70.7%) and Prawns (68.6%) were by far the most popular species consumed in more than two-thirds of the households.

In Group II more than a quarter of the households consumed three very popular species of shellfish - crabs, bugs and scallops; and slightly over a third of the households ate snapper. This popularity in demand of select species is partly attributed to the supply characteristics of the area. Of the total fish production for 1982-83, 45.7 percent comprised Barramundi. This is despite the significant decrease (37%) in the Barramundi catch since 1977 (Department of Primary Production, Darwin, 1983). Further, approximately two-thirds of the households engaged in fishing activities in Darwin caught Barramundi (chapter 12). Barramundi has a distinctive flavour and it is not surprising that demand remains high for this species. Next to Barramundi, 31.0 percent of the local production comprised Threadfin Salmon which in contrast, was consumed by only a fifth of the households. Of the total crustacean production 97.6 percent consisted of prawns. A large proportion of this does not enter the domestic market because of its export orientation.

Those species in Groups III to V in Table 29, while having a lower percentage of households consuming it at present, may have every possibility of an increase in consumption with promotion campaigns and other marketing strategies discussed in chapter 14. Diversification to other species is very necessary when considering the possible overfishing and even the final depletion of some species such as Barramundi and crabs in the future. The wide variety of species consumed among the Darwin households illustrates the greater

TABLE 29: Fresh Fish and Shellfish Species Consumed at Home

CATEGORIES	SPECIES	% OF CONSUMERS HOUSEHOLDERS (n = 432)
Group I	Barramundi	70.7
	Prawns	68.6
Group II	Snapper	39.0
	Crabs	29.6
	Bugs	29.1
	Scallops	26.3
	Red Emperor	23.1
	Threadfin Salmon	20.1
Group III	Squid	16.9
	Jewfish	16.6
	Oysters	16.4
	Spanish Mackerel	16.4
	Queenfish (Skinny)	15.2
	Bream	14.8
	Lobsters	13.6
	Parrot-fish	12.5
	Cod	12.2
	Coral Trout	11.8
Group IV	Trevally	9.9
	Sea Perch	9.5
	Whiting	9.2
	Sweetlip	9.0
	Mullet	7.4
	Stripey	6.7
	Estuarine Rock Cod	6.2
	Catfish (Moon fish)	5.8
	Shark (Flake)	5.3
Group V	Octopus	4.8
	Red Finned Emperor	4.6
	Flounder	4.4
	Reef Fish	4.4
	Flathead	3.7
	Mangrove Jack	3.0
	Grunter	2.8
	Tuna	2.8
	Turram	2.3
	Mussels	1.6
	Stingray	1.4
	Barracuda	1.4
	Cuttlefish	1.2
	Butterfish	1.2
	Other[1]	

[1] Halibut; Javeline; Anchovies; White Bait; Angelfish; Red Salmon; Ock Ock; Spanish Flag; Cockles; Yabbies (contributing 0.2-0.7%)

flexibility of increasing consumption of the lesser known species through market promotion.

In other capital cities, the five most popular species eaten at home were: Bream (11.3%), Snapper (11.0%), Flathead (10.6%), Whiting (10.2%) and Mullet (6.3%). However, here too, there were regional variations depending on availability of species. In Sydney and Canberra, Bream was the most popular, in Perth it was Snapper, in Melbourne and Adelaide, Whiting, in Hobart, Flathead, and in Brisbane, Mullet (DPI 1978).

7.1.1 ETHNIC HOUSEHOLDS

Interesting relationships were observed between consumption of select species and certain socio-economic variables. Barramundi and Prawns were the two

TABLE 30: Most Popular Species of Fresh Seafood Consumed by Different Ethnic Groups

ETHNIC GROUP	RANK	SPECIES	% CONSUMER HOUSEHOLDERS
Australian	(1)	Barramundi	72.1
	(2)	Prawns	62.6
	(3)	Snapper	37.9
	(4)	Bugs	30.1
	(4)	Crabs	30.1
Adriatic	(1)	Prawns	83.3
	(2)	Barramundi	56.7
	(3)	Snapper	50.0
	(3)	Calamari	50.0
	(4)	Octopus	36.7
	(4)	Bugs	36.7
	(5)	Red Emperor	33.3
	(5)	Crabs	33.3
European	(1)	Barramundi	73.9
	(2)	Prawns	71.7
	(3)	Snapper	47.8
	(4)	Crabs	30.4
	(4)	Red Emperor	30.4
British	(1)	Prawns	71.4
	(2)	Barramundi	69.5
	(3)	Snapper	36.2
	(4)	Bugs	30.5
Asian	(1)	Prawns	92.0
	(2)	Barramundi	72.0
	(3)	Squid	40.0
	(4)	Bream	36.0
	(4)	Snapper	36.0
	(5)	Spanish Mackerel	32.0
	(5)	Scallops	32.0

most popular species consumed among all households irrespective of ethnic origin (Table E1, Appendix II). As much as 92.0 percent of Asian households and 83.3 percent of Adriatic (mainly Greek origin) households consumed prawns. There were also a few select species of seafood more favoured among some ethnic households than others. For example, Calamari (squid) and Octopus were consumed by approximately a third of the Adriatic households; Bream, Spanish Mackerel, Scallops and Squid were consumed among a third or more of the Asian households. There were also other species which were consumed exclusively by certain ethnic households, for example, Halibut by European households (mainly Western European) or Red Salmon by Australian households.

Table 30 above summaries the most popular fresh seafood species consumed by different ethnic households (consumed by 30% or more households).

This table illustrates the relative importance of various species among different ethnic households. This information is very useful when trying to assess the market potential for species in different areas - either within a town, interstate or internationally.

TABLE 31: Most Popular Species of Fresh Seafood Consumed by Different Income Groups

INCOME GROUP ($)	RANK	SPECIES	% CONSUMER HOUSEHOLDERS
Very Low Income (8,000)	(1)	Barramundi	54.5
	(1)	Prawns	54.5
	(2)	Crabs	36.4
	(2)	Snapper	36.4
Low Income (8,001-18,000)	(1)	Barramundi	68.7
	(2)	Prawns	62.7
	(3)	Snapper	35.8
	(4)	Crabs	34.3
Average Income (18,001-35,000)	(1)	Barramundi	71.8
	(2)	Prawns	66.0
	(3)	Snapper	37.8
	(4)	Bugs	30.3
	(5)	Crabs	22.3
High Income (35,000-75,000)	(1)	Prawns	77.3
	(2)	Barramundi	68.2
	(3)	Snapper	44.3
	(4)	Crabs	37.5
	(5)	Red Emperor	34.1
Very High Income (>75,000)	(1)	Barramundi	74.7
	(2)	Prawns	72.2
	(3)	Snapper	39.2
	(4)	Bugs	34.2
	(5)	Crabs	32.9

7.1.2 INCOME

Species of seafood consumed were also found to vary with different income levels (Table E2). Overall the widest range in species consumed was found in those households having an income of between $18,001 and $35,000. As expected the least range in species consumed was found in the very low income group of less than $8,000. Irrespective of household income Prawns and Barramundi were consumed by more than 50 percent of households, Snapper between 35 to 45 percent and Crabs between 20 to 40 percent of households in each income group - see Table 31 for a summary of most frequently consumed species among different income groups (frequencies of 30% in consumer households).

From the above Table a strong relationship between the higher income levels and the consumption of higher priced species such as Barramundi and Prawns is evident.

TABLE 32: Frozen Pre-Packaged Fish and Shellfish Species Consumed at Home

CATEGORIES	SPECIES	% OF CONSUMERS HOUSEHOLDERS (n = 185)
Group I	Fish fingers	80.2
Group II	Scallops	16.5
	Prawn cutlets	13.9
	Fish cakes	12.3
	Whiting	11.2
	Prawns	10.7
Group III	Cod	9.1
	Flounder	6.4
	Fish sticks (Sea legs)	5.9
Group IV	Fishburgers	4.8
	Plaice	2.1
	Sea shantys	2.1
	Snapper	1.6
	Sea Perch	1.6
	Sea Bream	1.6
	Rainbow Trout	1.6
	Others#	4.5

Seafood crepes, Haddock, Mussels, Oysters, Shrimps, Seafood cocktail, Fish in parsely sauce, Sweet and sour, Herring fish (contribution 0.5% each)

7.2 FROZEN PRE-PACKAGED FISH AND SHELLFISH

In this form of seafood, four groups of species can be identified according to popularity of consumption within Darwin (Table 32):

Group I : more than 80 percent consumed
Group II : 10-19.9 percent consumed
Group III : 5-9.9 percent consumed
Group IV : less than 5 percent consumed

The popularity of fish fingers (80.2%) above all other species of frozen pre-packaged seafood, is overwhelming. In the other capital cities too, fish fingers was very popular together with Whiting and Flounder. *The latter species were also popular among the Darwin households. Nevertheless, several shellfish species - such as pre-packaged scallops, prawn cutlets, prawns etc. - were more popular in the Darwin household than among the other capital cities.

7.2.1 INCOME

Unlike in the case of fresh seafood consumption, no distinct connection between frozen pre-packaged species and levels of income was evident (Table E3). The widest range in species consumed, once again, was among the average income households ($18,000-35,000), followed closely by the high income households ($35,000 -75,000). Some of the products were consumed exclusively by certain income groups only. For example, 'Sea Shantys' were consumed by only the 4.1 percent sample households belonging to the $18,001-35,000 range income and Haddock by the 3.2 percent sample households with an income of $35,001-75,000. Further research is required to find out whether particular seafood products appeal to consumers of a special income class. Only broad generalisations of these characteristics are possible in this report.

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* A percentage value cannot be given for comparison since the statistical methods used in assessing the hierarchical positioning of species within each form are different in the two surveys.

7.3 SMOKED, CURED, DRIED FISH AND SHELLFISH

Three broad categories may be identified in smoked seafood, as illustrated in Table 33 below.

TABLE 33: Smoked, Cured, Kippered, Dried Fish and Shellfish Species Consumed at Home

CATEGORIES	SPECIES	% OF CONSUMER HOUSEHOLDERS (n = 106)
Group I	Cod	60.2
Group II	Haddock	14.8
	Herring (Bottled)	12.0
	Salmon	8.3
	Mussels	7.4
	Rollmops	7.4
Group III	Oysters	2.8
	Ikan bilis (Dried anchovies)	2.8
	Cockles	2.8
	Kippers	1.9
	Caviare	1.9
	Eels	1.9
	Others*	1.8

* Ling, Baeatha (Portuguese); (contribution 0.9% each)

These groups conform to the following frequencies:

Group I : more than 60 percent of consumers
Group II : 5-15.9 percent of consumers
Group III : less than 5 percent of consumers.

Even though the percentage of consumers eating the different forms of smoked fish is relatively small, it was seen from an earlier discussion that distinct market segments demanded these species. This is further illustrated in Table E4.

Cod in Group I above, was by far the most popular (60.2%) species of smoked fish consumed in Darwin. Even in the other capital cities, 36.4 percent of consumers ate smoked cod. Further in the capital cities, 5.8 percent consumed smoked herrings (Darwin, 8.3%). It is noteworthy that in Darwin, 14.8 percent of households consumed smoked Haddock.

7.3.1 INCOME

No clear relationship was seen between levels of household income and smoked/dried seafood consumption. The sample of households in the less than $8,000 income group was too small to be taken into consideration in this analysis. Whilst the $18,001-35,000 income group had the widest range in species consumed, smoked cod was consumed by more than 50 percent of households in each sub-group. Approximately a third of the households in the $8,001-18,000 group (low income) consumed smoked herring and a third of the households in the more than $75,000 group (very high income) consumed smoked haddock. Other species listed were consumed in less than a fifth of the consumer households in each sub-group.

7.4 CANNED FISH AND SHELLFISH

TABLE 34: Canned Fish and Shellfish Species Consumed at Home

CATEGORIES	SPECIES	% OF CONSUMERS HOUSEHOLDERS (n = 381)
Group I	Tuna	70.9
	Salmon	60.6
	Sardines	55.9
	Oysters	43.6
Group II	Anchovy	12.9
	Mussels	12.3
	Herring	11.5
	Crabs	8.7
	Prawns	8.1
	Kippers	6.6
	Mackerel	5.8
Group III	Pilchards	4.5
	Baby Clam	2.6
	Shrimps	2.1
	Others*	2.2

* Snoek; Octopus; Fish in sauce; Squid; Sprats; Cod roe; (contribution 0.5% to 0.3% each)

In canned seafood, the difference between the most popular species, Tuna and the others was not as great as in the other forms of seafood. Yet, three groups of seafood species can be identified according to popularity in consumption - Table 34:

Group I : more than 40 percent of consumers
Group II : 5-15.9 percent of consumers
Group III : less than 5 percent of consumers.

In the other capital cities too, Tuna (38.1%), Salmon (34.8%) and Sardines (16.1%) were the most popular consumed species among canned seafood products. Canned Oyster consumption (43.6%) was somewhat exclusive to the Darwin household. Tinned crabs (8.7%) and tinned prawns (8.1%) were less popular than other forms of canned seafood in Darwin, probably owing to the availability of these species in fresh form.

7.4.1 INCOME

Table 35 below summarises the most frequently consumed species of canned seafood according to income groups (consumed by 20% and more households). Further details are found in Table E5.

TABLE 35: Most Popular Species of Canned Seafood Consumed by Different Income Groups

INCOME GROUP ($)	RANK	SPECIES	% CONSUMER HOUSEHOLDERS
Very Low Income (<8,000)	(1)	Sardines	60.0
	(2)	Tuna	40.0
	(2)	Anchovy	40.0
	(3)	Mackerel	20.0
Low Income (8,001-18,000)	(1)	Sardines	63.8
	(2)	Tuna	59.4
	(3)	Salmon	50.7
	(4)	Oysters	39.7
Average Income (18,001-35,000)	(1)	Tuna	71.8
	(2)	Salmon	61.8
	(3)	Sardines	51.8
	(4)	Oysters	47.6
	(5)	Crabs	22.3
High Income (35,000-75,000)	(1)	Tuna	75.3
	(2)	Salmon	63.6
	(3)	Sardines	62.3
	(4)	Oysters	39.0
Very High Income (>75,000)	(1)	Tuna	78.0
	(2)	Salmon	69.5
	(3)	Sardines	49.2
	(4)	Oysters	45.8

From the above Table it can be seen that in the more expensive species like tuna and salmon, frequency of consumption within each group increased with increasing income. A reverse relationship between sardine and income levels was also evident.

7.5 FAVOURITE SPECIES OF THE HOUSEHOLD

Often the most frequently consumed species in a household may not necessarily be the most favoured. Consumer sovereignty in seafood is yet to be attained. Market conditions often dictate the species to be consumed by households. Therefore, in the Darwin survey a question pertaining to the favourite seafood of the household was included. Answers had to be restricted to the two most popular species agreed upon by the householders. These results are presented in Table 36 below.

TABLE 36: Most Preferred Fish and Shellfish Species of Householders

SPECIES	% OF CONSUMERS HOUSEHOLDERS (n = 450)
Prawns	39.8
Barramundi	32.7
Lobsters	16.9
Crabs	11.8
Oysters	10.0
Bugs	8.7
Snapper	6.7
Scallops	4.9
Red Emperor	3.3
Coral Trout	2.2
Threadfin Salmon	2.2
Tuna	2.2
Squid (Calamari)	2.0
Bream	1.8
Jewfish	1.8
Cod	1.3
Tuna	1.3
Whiting	1.3
Reef Fish	1.1
Rainbow Trout	1.1
Spanish Mackerel	0.9
Shark	0.9
Mangrove Jack	0.7
Oysters	0.7
Catfish (Moonfish)	0.7
Mullet	0.7
Queenfish (Skinny)	0.7
Sea Perch	0.7
Others#	4.6

Garfish; Plaice; Sardines; Octopus; Mussels; Abalone; Flathead; Butterfish; Parrotfish; Stripey; Trevally; Anchovies; Whitebait; Red Salmon; Ock Ock; Kina (NA); Paua (NA); Cockles; Yabbies (contribution 0.4% to 0.2% each)

Of the ten most preferred species among the Darwin householders, six were shellfish confirming the greater popularity of this form of seafood. Almost 40 percent of the consumer households reported Prawns to be their favourite seafood species. Barramundi was the second most preferred species among approximately a third of the consumers. Between 10 to 17 percent of consumers said: Lobsters, Crabs or Oysters were their favourite seafood and between 4 and 9 percent stated: Bugs, Snapper and Scallops as their favourite seafood.

A small percentage of households (6.3 percent) did not have a favourite seafood as such. A few households with young children said "any fish that is small, fresh and can be baked" would be their favourite, which indicated no special preferences for flavour. Preferences for distinct flavours in seafood by different ethnic groups can be identified in Table E6, Appendix II.

7.5.1 ETHNIC HOUSEHOLDS

Prawns and Barramundi were the most favoured species among all ethnic groups. However, there were variations among these sub-groups with regard to the degree of popularity of these two species. For example, Barramundi was the second most preferred species among both Australian and Asian ethnic groups. Yet, while 30.9 percent of the Australians stated Barramundi to be their favourite only 19.0 percent Asian households stated the same. Table 37 below ranks the favourite species among 15 percent or more households in each ethnic group.

Some interesting characteristics are illustrated in the table below. Among all ethnic groups, the largest percentage of households favouring Prawns was that of the Australian group. In this same group Lobsters were as popular as Barramundi and ranked as the second favourite seafood. Quite clearly shellfish species were in great demand among this ethnic group. This table should be compared with Table E6 which gives the species at present consumed at home by each ethnic group. For example, among the Australian group, Barramundi was consumed among 72.1 percent of households, Prawns 62.6 percent, Crabs 30.1 percent, Oysters 18.3 percent and Lobsters by only 14.2 percent of households. Snapper (37.9%), Bugs (30.1%) and Scallops (23.7%) were consumed by a relatively large proportion of Australian households.

Prawns and Barramundi were both equally favoured as the top favourite by the Adriatic households. Red Emperor was the second favourite. In actual consumption patterns, besides Barramundi (56.7%) and Prawns (83.3%), Snapper and Calamari were consumed by 50.0 percent of the Adriatic households, and Red Emperor by only 5.5 percent (Table 6E).

TABLE 37: The Most Preferred Seafood Species by Ethnic Group

ETHNIC GROUP	RANK	SPECIES	% CONSUMER HOUSEHOLDERS
Australian	(1)	Prawns	54.5
	(2)	Barramundi	30.9
	(2)	Lobsters/Crayfish	30.9
	(3)	Oysters	19.1
	(4)	Crabs	16.2
Adriatic	(1)	Prawns	52.6
	(1)	Barramundi	52.6
	(2)	Red Emperor	21.1
European	(1)	Barramundi	51.6
	(2)	Prawns	45.2
	(3)	Bugs	25.8
	(4)	Lobsters/Crayfish	19.4
British	(1)	Prawns	49.0
	(2)	Barramundi	46.9
	(3)	Lobsters/Crayfish	20.4
Asian	(1)	Prawns	47.6
	(2)	Barramundi	19.0
	(2)	Crabs	19.0
	(2)	Tuna	19.0

Among the European households, in actual consumption patterns, after Barramundi (73.9%) and Prawns (71.7%), Snapper (47.8%) was the most consumed species. Bugs and Lobsters were consumed by only 28.3 percent and 13.0 percent of households respectively.

Once again, among the British households over a third consumed Snapper (36.2%), and Lobsters only 13.3 percent. Even though less than half the British households stated that Prawns and Barramundi were their favourite seafood, in actual consumption percentages Prawns were consumed by 71.4 percent and Barramundi by 69.5 percent of these households.

It is interesting to note that although only 19.0 percent of Asian households stated Barramundi was their favourite seafood in actual fact as many as 72.0 percent of these same households consumed it. Again, whilst 92.0 percent consumed Prawns, only 47.6 percent stated them to be their favourite seafood. On the other hand while 40.0 percent of Asian households consumed Squid/Calamari, only 9.5 percent stated it to be their favourite seafood. Bream, Snapper, Spanish Mackerel and Scallops were consumed by approximately a third of the households, yet very few stated these as their favourite seafoods.

Thus it is evident from the above analysis that consumption is largely dictated by the availability of species in the region. Would consumption increase if the favourite species of seafood were introduced to different market segments?

CHAPTER 8. HOUSEHOLD CHARACTERISTICS OF SERVING SEAFOOD

This section examines select features of serving seafood at home such as the day of the week when seafood was served, at which meal and the method of cooking seafood.

8.1 DAYS OF THE WEEK WHEN SEAFOOD WAS SERVED

The original questionnaire had the seven days of the week listed separately. However, when editing the questionnaire it was found that the pattern of eating seafood generally corresponded to:

(a) consumption between Mondays to Thursday;
(b) consumption on Fridays; and
(c) consumption on Saturday and/or Sunday.

These results are presented in Table 38.

TABLE 38: Day of the Week Each Form of Seafood was Served at Home: Percentage of Consumption Occasions

FORM OF SEAFOOD	MONDAY-THURDSAY	FRIDAY	SATURDAY & SUNDAY	NOT SURED
FISH				
Fresh	1.4	7.4	11.4	80.4
Frozen				
Pre-Packaged	2.8	6.8	10.7	81.4
Smoked/Dried	2.0	5.9	5.9	86.3
Canned	4.8	3.2	15.6	78.2
SHELLFISH				
Fresh	1.8	3.5	19.1	76.2
Frozen				
Pre-Packaged	-	10.0	10.0	84.0
Smoked/Dried	-	7.7	7.7	84.6
Canned	1.1	1.1	20.4	77.4

It is very obvious from this Table that all forms of seafood were served at home mainly during the weekend. Of the different forms, fresh shellfish and canned shellfish appear to be most frequently served on Saturday/Sunday. On Fridays, the most frequently served form was frozen pre-packaged shellfish. During the week, Monday to Thursday, canned fish was the most popular.

It must be noted, however, that the pattern illustrated here refers to only about 20 to 25 percent of the sample households. Between 76.2 percent (fresh shellfish) and 86.3 percent (smoked/dried fish) households were unable to recall when each form of seafood was served, mainly because there was no set routine in serving meals at home.

According to the capital cities survey, Friday was the day on which fish was most often served, and Saturday and Sunday were the days when shellfish was served most frequently (DPI, 1978, p.26). Table 38, for Darwin, somewhat supports this trend, in that shellfish (fresh, frozen pre-packaged, smoked and canned) had a higher frequency of consumption than fish over the Saturday/Sunday period.

8.1.1 RELIGION

The relationship between day of the week when seafood was served and religion, is given in Table F1, Appendix II. In all groups except the Catholics, seafood was most frequently served on Saturday/Sunday. Among the Catholic households the frequency of serving seafood on a Friday (45.8%) was marginally higher than that of serving on a Saturday/Sunday (41.0%). This probably is a reflection of the traditional Catholic habit of serving fish instead of meat on a Friday.

8.2 MEALS AT WHICH SEAFOOD WAS SERVED

In Table 39 below, it can be seen that the rate of recall of the respondents was much higher than when asked the day of the week when seafood was eaten at home. Except in the case of canned fish, seafood of all forms was consumed mainly at the evening meal. Whilst canned fish had the lowest frequency (47.3%), fresh fish (96.1%) and shellfish (84.5%) had the largest percentage of households serving these forms at the evening meal. Canned fish (56.5%) and shellfish (21.0%) had the highest frequencies of serving at the mid-day meal. From Table 38, it was noted that canned fish was served mainly during Monday to Thursday. This characteristic together with the incidence of serving it at mid-day certainly supports the fact that it is used mainly in sandwiches as a lunch time snack. Among all forms, the popularity of smoked fish (7.8%) and shellfish (7.7%) at breakfast (Table 39) and during the weekend (Table 38) is very characteristic.

The same trends were reported in the capital cities survey. That is, fish was eaten mainly at the evening meal on half the occasions when it was served. On 39 percent of all occasions it was served at mid-day and only 5 percent of the occasions for breakfast. Canned fish was eaten mainly at the mid-day meal, smoked fish (14%) and fish fingers (90%) on a number of occasions

at breakfast, similar to Darwin. Shellfish too was eaten mainly at the evening meal in the capital cities, and as a lunch time meal on about a quarter of the occasions and hardly ever at breakfast (ibid, p.27). Thus overall the broad characteristics of serving seafood at particular meals were similar in all capital cities of Australia, including Darwin.

TABLE 39: Meal at Which Each Form of Seafood was Served at Home: Percentage of Occasions

FORM OF SEAFOOD	BREAKFAST	MIDDAY	EVENING	OTHER & NOT SURE
FISH				
Fresh	1.7	4.1	96.1	1.9
Frozen Pre-Packaged	6.2	10.2	75.1	10.2
Smoked/Dried	7.8	12.7	71.6	11.8
Canned	1.9	56.5	41.9	7.8
SHELLFISH				
Fresh	-	7.9	84.5	11.7
Frozen Pre-Packaged	-	2.0	80.0	18.0
Smoked/Dried	7.7	15.4	61.5	15.4
Canned	0.5	21.7	47.3	34.4

8.3 METHODS OF COOKING SEAFOOD

Each household reported up to a maximum of five different methods each, of preparing fish and shellfish. A variety of different cooking styles were reported. For the sake of uniformity, seven broad groups were identified as given in Table 40. The most popular method of preparation, both for fish (39.8%) and shellfish (50.2%) was fry and/or crumb. On 20.6 percent of the occasions fish was grilled or barbequed, whilst on 24.1 percent of the occasions shellfish was boiled or steamed. Between 10 to 15 percent of the occasions fish and shellfish were either consumed 'straight' - i.e. from a tin to be eaten as a salad or in sandwiches, entree, etc. or baked.

These cooking methods used by the Darwin householders contrast somewhat with that of the other capital cities where on 40.0 percent of the occasions fish was served 'straight', on a third of the occasions it was fried. The use of grilling, baking, boiling and other methods for cooking fish were rarely used among the other capital cities. The same applied to shellfish, where it was consumed mainly without further cooking or 'straight'. Thus overall the consumers in Darwin show

more ingenuity in preparing various forms of seafood. It was felt that the latter feature could be an outcome of the very cosmopolitan society of Darwin. Therefore, cooking methods were related to ethnic origin in Table F2, Appendix II.

TABLE 40: Cooking Method for Fish and Shellfish Served at Home: Percentage of Occasions

COOKING METHOD	FISH	SHELLFISH
Fry and/or crumb	39.9	50.2
Boil and/or steam	6.0	24.1
Bake	13.8	-
Straight	11.9	14.6
Curry	6.1	3.3
Grill and/or BBQ	20.6	5.7
Other	1.9	2.2

8.3.1 ETHNIC ORIGIN

The Adriatic households appear to have the greatest variety in methods of preparing seafood at home. On more than 100 percent of the occasions a minimum of three different methods of cooking were used in these households. The British households too exhibited a similar range in cooking methods. On more than a 100 percent of the occasions these householders used at least three different methods of preparing seafood. Surprisingly, the least variation was shown among the Asian households. Yet approximately, a third (30.8%) of the Asian households used 'other' methods of preparing seafood (Table F2, Appendix II).

CHAPTER 9. CONSUMPTION OUTSIDE THE HOME

It was noted in chapter 4 (Table 2) that 84.8 percent consumers ate seafood outside the home as well, - at takeaway outlets, restaurants, clubs, pubs etc.

Takeaway outlets by definition include all fast food outlets, fish and chip shops including Chinese takeaway outlets. 63.5 percent of all seafood consumers used these takeaway outlets. Restaurants on the other hand, included all those places serving seafood buffets or barbecques. 74.9 percent of consumers used this source.

The relationship between eating seafood outside the home and certain socio-economic variables was looked at in chapter 4. Some of the main features of this analysis are summarised here:

i) Households with more than 5 persons employed in the household (highest category) used takeaway and restaurant outlets most frequently (Table B3).

ii) Households comprising 'Adults with two or more children' and 'Single adults' had the highest frequencies of eating out (Table B4).

iii) Those households with an income of between $35,001 and $75,000 ('high income') had the highest incidence of eating out (Table B2).

iv) Among the different religions, 'Other christians' had the highest frequency of eating out, followed closely by 'Catholic' (Table B6).

v) Of the ethnic groups, the British households had the highest frequency of eating outside the home followed closely by the European households (Table B5).

TABLE 41: Consumption of Seafood Outside the Home

LOCATION	ABSOLUTE FREQUENCIES	% OF ALL CONSUMERS (n = 480)	% OF ALL CONSUMERS HOUSEHOLDS (n = 501)
Takeaway	318	66.3	63.5
Restaurant	375	78.1	74.9

9.1 INCOME

Further, Table 42 indicates the close relationship between the income of households and the percentage eating out. Almost two-thirds of those households with an income of less than $8,000 (very low income) do not eat out - the reason being obvious. At the same time, however, just over a quarter of the households with an income of more than $75,000 (very high income) also do not eat at restaurants or takeaway outlets. The latter feature can be explained with reference to the definition of the term, 'eating outside the home'. Among the very high income group, quite a large percentage dined at restaurants, but few ate from fish and chip shops, identified as takeaway outlets. In the other income groups these were patronised almost equally.

TABLE 42: Consumption of Seafood at Restaurants by Income: Percentage Occasions

INCOME GROUP ($)	RESTAURANT CONSUMPTION	CONSUMERS	NON CONSUMERS
<8,000		36.4	63.6
8,001-18,000		76.9	23.1
18,000-35,000		79.9	20.1
35,001-75,000		87.1	12.9
>75,000		70.5	29.5

The above characteristics of the population are very important considerations when planning the locations of seafood restaurants or takeaway outlets within a city.

9.2 FREQUENCY OF CONSUMPTION

Almost three-fourths (72.6%) of the consumers used takeaway outlets between 1 and 5 times per month. Just over half the consumers dining at restaurants (for the consumption of seafood), did so with the same frequency of between 1-5 per month. In addition, a few (0.8%) of those using restaurants, dined out with a frequency of more than 16 times per month - Tables 43 and 44.

TABLE 43: Monthly Consumption of Seafood at Takeaway Outlets

MONTHLY FREQUENCIES	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
0-<1	69	21.7
1-5	231	72.6
6-10	16	5.0
11-15	2	0.6

TABLE 44: Monthly Consumption of Seafood at Restaurants

MONTHLY FREQUENCIES	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
0-<1	145	38.7
1-5	215	57.3
6-10	12	3.2
11-15	-	-
16-20	2	0.5
>30	1	0.3

9.3 SPECIES CONSUMED

There was quite a large percentage (71.7%) of consumers using takeaway outlets who were unable to identify the species consumed. Of those who were able to identify the species consumed, 74.4 percent ate Prawns (Table 45). This was by far the most popular species, probably consumed mainly through Chinese takeaway outlets.

Even among those who dined at Restaurants, Prawns were the most favoured species eaten by 45.1 percent of the consumers. Slightly less than a fourth of these consumers ate Oysters (22.9%) and Barramundi (22.3%). From Table 46, the overall popularity of shellfish species at restaurants is very clear. The problem of species identification was less severe at restaurants owing to the use of menu's to order the meal. Here too some doubt was expressed regarding the species served and that identified on the menu.

TABLE 45: Seafood Species Consumed at Takeaway Outlets

SPECIES	% OF CONSUMERS (n = 90[1])
Prawns	74.4
Barramundi	12.2
Scallops	8.9
Shark/Flake	5.6
Flounder	2.2
Whiting	2.2
Other[2]	6.6

1 71.7% of consumers using takeaway outlets were unable to identify the species bought.

2 Barracuda; Bream; Oysters; Squid.

TABLE 46: Seafood Species Consumed at Restaurants

SPECIES	% OF CONSUMERS (n = 328[1])
Prawns	45.1
Oysters	22.9
Barramundi	22.3
Lobsters	13.7
Scallops	3.7
Squid	2.7
Bugs	2.1
Rainbow Trout	1.5
Herring	1.2
Snapper	1.2
Whiting	1.2
Abalone	0.6
Crabs	0.6
Barracuda	0.6
Other[2]	3.3

1 12.5% of consumers using Restaurants were unable to identify the species bought.

2 Bream; Cod; Flathead; Flounder; Grunter; Red Emperor; Reef Fish; Garfish; Red Salmon; Sole.

Eating outside the home experienced tremendous popularity in countries like America, where one in five meals is taken away from the home (National Food Situation, May 1980). Even though in Australia, currently this frequency is much lower, in keeping with food trends in the rest of the world it is very probable that with increasing affluence in the future, the proportion of consumers eating away from home will increase. Thus the institutional market for seafood will require different management strategies from that of household consumption. These aspects are discussed in chapter 14.

CHAPTER 10. ATTITUDES TO CONSUMPTION

Owing to the recently publicised information regarding ciguatera (reef fish poisoning), it was felt necessary to find out what percentage of Darwin households were affected or even aware of this problem and whether their seafood consumption habits were changed as a result of this.

Table 47 below illustrates that approximately just over half the Darwin households (56.9%) were aware of the problem of ciguatera, mainly through the media. A very small percentage had direct contact with the disease.

TABLE 47: Ciguatera Awareness Among Seafood Consumer Households

	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
Aware of ciguatera	273	56.9
Not aware of ciguatera	207	43.1
TOTAL	480	100.0

It is encouraging to note from Table 48 that the majority (90.5%) of households stated their seafood consumption habits had remained unchanged. Just under ten percent of households stated they were cautious in their seafood eating habits. A few typical statements made by the latter group are quoted below. Most commented they avoid eating reef fish or fish from "ciguatera prone areas". Some said they don't like 'shiny' fish like Skinny or Mackerel since they felt the ciguatera poisoning was present in such fish. A few said their seafood consumption habits were affected temporarily while living at Gove and Groote Eylandt (where there had been a number of consumers affected by ciguatera), but not in Darwin. Some others who had heard about it, but not been affected directly said they test the fish on the cat first, before consuming it!

TABLE 48: Effect of Ciguatera Awareness on Seafood Consumption

	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES (%)
Positive effect	26	9.5
No effect	247	90.5
TOTAL	273	100.0

Thus overall, the problem of ciguatera awareness affecting seafood consumption patterns, is minute. Since Darwin is not a major area prone to ciguatera poisoning, this should not be a major problem to the seafood industry of Darwin even in the future. Yet, the industry should be cautious of seafood brought into Darwin from other areas, particularly of those species known to be affected by this problem.

CHAPTER 11. PURCHASING PATTERNS

Purchasing characteristics and attitudes of the consumer are to a large extent a reflection of supply conditions. This section therefore examines sources of seafood purchases, purchase preferences and attitudes of the consumer.

11.1 SOURCE OF PURCHASE

In Darwin, seafood was made available to the consumer directly from the fishermen, through a wholesaler, a chain supermarket, a specialised fish shop, a neighbourhood store or even from the butcher. However, the relative frequency of using these sources varies with different forms of seafood - Table 49.

The chain supermarket, such as Coles or Woolworths, was the most popular source of purchase for all forms of seafood, except fresh. As much as 89.7 percent of frozen pre-packaged seafood and 89.4 percent of canned seafood was purchased here. In contrast, only 7.4 percent of fresh seafood was purchased at the chain supermarket.

The more popular sources of supply for fresh seafood were the speciality fish shop (49.4%) such as Pedros, or fish given via friends or relatives (47.3%) who were themselves engaged in amateur fishing activity. This characteristic clearly emphasised the demand for high quality, fresh seafood.

In the category of 'other' (29.2%) sources of fresh seafood supplies, 1.2 percent was purchased at the butcher shop. This was an unusual, nevertheless, interesting feature of some of the Darwin butcher shops, since meat and fish keenly competed in the average household diet. The commercial fish market had a relatively low percentage (6.3%) of consumers patronising it at the time of the researcher's survey, since it was practically non-operative at that time, and in fact non-existent at present. The mobile fish van is a very useful addition to the distribution of fish supplies. At the moment it services only the population of Greater Darwin by retailing at strategic points along arterial roads or at weekend markets such as Rapid Creek. This service should be extended to serve some of the outback areas of the Northern Territory.

The local supermarket or the neighbourhood store found in most local shopping complexes was the second most important source of supply for all forms of seafood except fresh. 21.5 percent of smoked/dried seafood, 18.6 percent of canned seafood and 15.8 percent of frozen pre-packaged seafood was purchased at this source.

TABLE 49: Source of Seafood Purchases: Percentage Occasions

SOURCE OF PURCHASE	FORM OF SEAFOOD	FRESH	FROZEN PRE-PACKAGED	SMOKED /CURED /DRIED	CANNED
Chain Supermarket		7.4[1]	89.7	83.2	89.4
Local Supermarket		2.6	15.8	21.5	18.6
Fish & Chip Shop		1.4	-	-	-
Fish Shop		49.4	3.3	7.5	-
Commercial Fish Market		6.3	-	-	-
Fish Van		4.9	-	-	-
Friends or relatives		47.3	-	0.9	-
Commercial Fisherman		4.6	-	-	-
Private Supplier/ Wholesaler		13.7	-	0.9	-
Overseas/ Interstate		-	-	0.9	0.8
Make own supplies		-	-	3.7	-
Other		29.2[2]	-	-	0.3[3]

1 Expressed as a percentage of all consumers in particular form of seafood

2 1.2% of the occasions fresh seafood was purchased at the butcher

3 Delicatessan

A local survey of the supermarkets by the researcher revealed that particularly in the case of canned seafood, the variety offered by way of species and different brands, was excellent at the local supermarket. The availability of smoked/dried seafood again was far better in these shops than in most Queensland towns like Townsville, Rockhampton or Mackay. The variety offered in frozen pre-packaged seafood was not as good as in the above two forms, yet fairly satisfactory.

Some of the speciality fish shops were also used by the households as sources for the purchase of smoked/dried seafood (7.5%) such as rollmops, bottled caviar etc. and for frozen pre-packaged seafood (3.3%).

A very small percentage of consumers purchased their smoked/dried seafood (0.9%) from overseas and their canned seafood (0.8%) from interstate i.e. a reflection on the supply conditions for select products. A further 3.7 percent of households made their own supplies of smoked fish, mainly because they disliked the chemical smoking used in the commercially prepared product.

The major sources of purchase of seafood, both within Darwin and other capital cities of Australia were broadly similar. Fresh fish was generally bought from a retail fish shop (38.6%) or fish market (18.1%), 27.1 percent was caught or received as a gift. For the other three forms of seafood the supermarket was the main source - canned fish was 95.0 percent, frozen pre-packaged fish 78.3 percent, smoked fish 37.0 percent. Excluding the category 'other', the next most important source for fresh fish was the retail fish shop (4.6%) and the delicatessen for smoked fish (19.6%) and canned fish (1.2%). For smoked fish, 16.1 percent was purchased from the retail fish shop (ibid, p.25). Thus, as in Darwin, fresh and smoked fish were purchased from a wide variety of sources.

However, although the supermarket dominated in the sale of frozen pre-packaged, smoked and canned seafood among the capital cities, there were individual variations between cities, in the main source of supply for fresh fish. In Melbourne, 29.0 percent bought from the Melbourne fish market. In Perth, as much as 46.7 percent obtained their fresh fish from friends and relatives or caught it themselves. In Hobart, an even larger percentage (52.0%) obtained their fresh fish from the latter source, emphasizing the significance of amateur fishing in both Hobart and Perth (ibid, p.25).

The source of supply for shellfish was similar to that of fresh fish in the other capital cities. 45.6 percent of fresh shellfish was purchased from the retail fish shop and a further 23.2 percent from the fish market. The supermarket was the major source of purchase for both frozen pre-packaged shellfish (70.1%) and canned shellfish (91.5%) (ibid, p.26).

11.2 PURCHASE PREFERENCE

Darwin seafood consumers were asked their preferences in terms of whole fish, gutted, scaled etc. when purchasing fish from retail outlets and also their willingness to try new species, if introduced to the market at a reasonable price. The views expressed are extremely important to seafood marketers and planners, and are discussed below.

11.2.1 PREFERENCE OF PURCHASE FORM

With reference to a set of cards, consumers were asked to arrange in rank order their preferences when purchasing fish - i.e. filleted, whole, gutted and scaled, headless, cutlets, gutted-scaled headless or if they had no particular preference. A rank position was then calculated for each type of presentation, based on the number of responses for each category and the 'average rank' value.

Households which did not purchase seafood, such as those who only receive or catch their own seafood, did not answer their question since it was irrelevant.

There was a very clear indication for the preference of purchasing fish in the form of fillets since 59.4 percent ranked fillets as their first preference (Table 50). A few qualified this answer by saying they preferred "butterfly fillets" (two sides open but still joined together).

It is very interesting to note that quite a considerable proportion of consumers preferred completely the opposite - i.e. to purchase fish in whole form. 19.7 percent stated whole fish as their first preference and a further 15.4 percent as their second preference. Gutted and scaled was the first preference of only 7.5 percent consumers and cutlets, first preference of a mere 2.0 percent. A further 1.2 percent said their first preference was to purchase fish gutted, scaled and headless. However, overall these latter groups were less significant than the previous two forms. The final rank positions indicated the majority of Darwin householders wished to purchase their fish filleted. The second preference being whole, third gutted and scaled, fourth cutlets, fifth headless and sixth preference gutted, scaled and headless. Even though 10.1 percent of the first preferences were 'No preference', the total number responding to this was only 37 households as against, for example, 7.5 percent responses of 134 households for the category 'gutted and scaled'.

11.2.2 WILLINGNESS TO TRY NEW SPECIES

Even though the most preferred species and currently the most consumed species in Darwin were Prawns and Barramundi, there is always the danger of rising costs and/or depleting resources of these species and other popular varieties. Therefore, for future planning it is very essential to find out whether consumers are willing to try non-traditional seafood species if introduced at a reasonably competitive price. It must be noted that the question asked through the survey was very broad, and did not refer to particular species. The general idea, however, was to assess the degree of response to a marketing innovation.

TABLE 50: Preference for Purchase Form of Fresh Fish

PURCHASE FORM	NO. OF RESPONSE	RANK								
		1st	2nd	3rd	4th	5th	6th	7th	AVERAGE RANK	FINAL RANK POSITION
		(% of responses)								
Fillets	263	59.42	11.30	3.77	1.74	0.00	0.00	0.00	1.32	(1)
Whole	184	19.71	15.36	5.80	0.87	11.59	0.00	0.00	2.42	(2)
Gutted & Scaled	134	7.54	12.46	11.30	5.51	2.03	0.00	0.00	2.54	(3)
Headless	103	0.00	4.35	5.51	13.91	6.09	0.00	0.00	3.73	(5)
Cutlets	115	2.03	11.01	8.41	5.51	6.38	0.00	0.00	3.10	(4)
No Pref.	37	10.14	0.29	0.00	0.29	0.00	0.00	0.00	1.11	-
Gutted, Scaled & Headless	7	1.26	0.87	0.00	0.00	0.00	0.00	0.00	1.43	(6)

5.4 percent of all consumers were unsure at the time the question was asked, and therefore did not answer the question. Of those who responded, 75.1 percent were willing to try new species if introduced at a reasonable competitive price, 24.9 percent refused to change their current eating habits - Table 51.

TABLE 51: Willingness of Consumers to try New Species Introduced to the Market

ATTITUDE	ABSOLUTE FREQUENCIES	% OF ALL CONSUMER HOUSEHOLDS (n = 480)	% OF RESPONDENTS (n = 454)
Willing	341	71.0	75.1
Unwilling	113	23.5	24.9
No Response	26	5.4	-

Some of the responses had qualifications attached such as "if they were good quality", "if fresh" etc. supporting the introduction of a high quality product. Others said they would be willing to try new species if they knew "how to cook it" - this has been a limiting factor with quite a few households even with species currently being marketed. A fairly significant proportion supported the introduction of local varieties as new species and commented "local seafoods should be sold at local product prices". A few said they were willing to try new species of "shellfish" only.

More market research is required to establish what particular flavours are desired by the consumers when introducing new species. Also it should be supported by techniques such as taste panels, cookery competitions and an intensive advertising campaign.

11.3 CONSUMER ATTITUDES TO PURCHASES

The general satisfaction of the consumer with the overall product is most important to establish confidence in that product and to establish a pattern of repeat buying. From this point of view complaints, if any, regarding the purchases made were recorded in the survey.

11.3.1 COMPLAINTS REGARDING THE DIFFERENT FORMS OF SEAFOOD

Table 52 below lists the total number of consumers with or without complaints regarding seafood purchases. It is gratifying to note that only a fifth to a third of

the households did have some kind of complaint. When conducting the survey, it was felt that some respondents were unable to think of specific complaints as such within the given time the questionnaire was administered, unless they were led into a conversation of discussing the adequacy of seafood retail shops or some other related factor. Therefore, even though the 'complaints' discussed in this section refer to only a third or so of the households, they are representative of much of the population and should be noted carefully for future planning.

TABLE 52: Households With or Without Complaints Regarding Different Forms of Seafood

HOUSE HOLDS	FRESH		FROZEN PRE-PACKAGED		SMOKED/ CURED/ DRIED		CANNED	
	ABSOLUTE FREQ.	RELATIVE FREQ.	ABSOLUTE FREQ.	RELATIVE FREQ.	ABSOLUTE FREQ.	RELATIVE FREQ.	ABSOLUTE FREQ.	RELATIVE FRQ.
With complaints	163	37.7	71	38.4	27	25.5	79	20.7
No complaints	269	62.3	114	61.6	79	74.5	302	79.3
Total consumers of each form	432	100.0	185	100.0	106	100.0	381	100.0

TABLE 53: Complaints Regarding Different Forms of Seafood

COMPLAINT	FRESH	FROZEN PRE-PACKAGED	SMOKED /CURED /DRIED	CANNED
Poor Packaging and Presentation	11.0	5.6	7.4	2.5
Poor Quality, Taste and Smell	33.7	81.7	66.7	40.5
Price too high	66.3	14.1	25.9	36.7
Unavailability	8.0	1.4	22.2	11.4
Suspect Product	7.4	15.5	-	24.1
Other	0.6	-	-	-

Most of the complaints were directed at fresh and frozen pre-packaged seafood. In general, most of the complaints appear to be directed at 'poor quality, taste and smell' and 'price too high' - Table 53.

11.3.2 ATTITUDES TO PURCHASE OF FRESH SEAFOOD

In fresh seafood, two-thirds complained about the high price. This was directed more specifically at Barramundi. The consumers stated this was their favourite fish, and that the price charged for a local product such as this in Darwin, was "ridiculous". Another third of the households had various complaints regarding the quality, taste and smell of the products. In most cases, the so called 'fresh' seafood was 'fresh/frozen'. Quite a few consumers said the product bought was 'dry and freezer burnt' or 'left too long in the freezer and therefore had no taste'. Since defrosting and refreezing (which they believed happened in retail shops) could contaminate the fish and also make it lose its flavour, they preferred unfrozen fresh fish. Another group of complaints was directed at specific species. For example; fresh water Barramundi tasted muddy; some species like Barramundi did not freeze well and therefore was not as good as the fresh product; Crabs were empty inside, Lobsters had no flavour; Oysters were of poor quality, and some Mullet tasted like kerosene. A few others believed preservatives had been added to the fresh/frozen product.

Eleven percent of the consumers expressed discontent mainly on the packaging of fresh/frozen seafood. They preferred to purchase filleted fish and headless prawns. Some found the fillets too thick and packages too large for individual requirements. Some stated that, for unfamiliar species in particular, they preferred recipes to be attached to the product. A few felt that fish and shellfish displays were not sufficiently attractive to induce the buyer to make a purchase.

Whilst a further 8.0 percent complained of the unavailability of species, particularly of Bugs, another 7.4 percent said they were not sure of the product purchased at the shops. They doubted the labelling of species on some packages and suggested more strict control of brands and fish sold to the public. Less than one percent complained that the fish retail outlet was distant from home.

11.3.3 ATTITUDES TO THE PURCHASE OF FROZEN PRE-PACKAGED SEAFOOD

In frozen pre-packaged seafood most (81.7%) of the complaints were directed at the poor quality, taste and smell of the product. Following are some of the comments: "soggy, soapy taste, oily, dry and tasteless, tough, soft and mushy" - obviously referring

to different products, but certainly highlighting consumer dissatisfaction. Some said the cheaper brands tasted horrible, to others the product was "too artificial" and a few disliked the crumbs which came off while cooking. Quite a few of these complaints were directed at frozen pre-packaged scallops - e.g. "too tough, tasted salty, undersized". Most of these complaints appear to be a result of poor refrigeration of the product.

The complaint regarding the product being suspect by 15.5 percent of consumers, was also related to poor refrigeration - e.g. "fear of the risk of contamination through defrosting caused by power failure". There were some others that suspected the species sold under a particular name - scallops sold were in great doubt as substitution by shark was suspected. The fish component included in the product 'sea shantys' was referred to as being 'inadequate'.

11.3.4 ATTITUDES TO THE PURCHASE OF SMOKED/DRIED SEAFOOD

In smoked/dried seafood too, most (66.7%) of the complaints were regarding the quality of the product sold - e.g. maggots on smoked scallops, rollmops being too old and falling apart and more generally complaints of the products not being smoked properly - "it was not fresh, didn't taste right, was leathery, too salty, too boney" etc. Quite a significant proportion of the 22.2 percent that complained of 'unavailability' referred to the scarcity of smoked Mackerel. Even though packaging was not as big a problem as in the case of fresh fish, consumers complained of the unhygenic packaging and of the smoked fish pieces being too thin. The latter, however, is inevitable with some species when dried.

11.3.5 ATTITUDES TO THE PURCHASE OF CANNED SEAFOOD

Among canned seafood consumers the main dissatisfaction (40.5%) was also directed at the quality of the seafood products canned. It was either "too watery", "too dry", "too oily", or "too salty". Some of the complaints were directed at specific species such as .... spoilt Oysters, Sardines and Prawns, and tasteless Crabs, Shrimps and Salmon. With reference to specific brands, SAFCOL, was referred to as being suitable only for fish cakes.

More than a third (36.7%) of the consumers complained of the relatively high price. Once again almost a fourth (24.1%) of the consumers suspected the product sold in the cans. Most of those in the latter group feared poisoning, botulism and high mercury levels - some even referred specifically to the "John West poison scare".

With reference to availability of the product, there were generally two schools of thought. One group refused to purchase imported canned seafood, another group would eat nothing but the imported brands. It was difficult to assess from this question whether there was a general preference for local or imported brands of canned seafood.

CHAPTER 12. FISHING HOUSEHOLDS

Recreational fishing is a 'way of life' in Darwin. It is not an uncommon sight to find the average Darwin householder pack up his fishing gear and make a trip to the billabong over a weekend or during his spare time. As such 45.6 percent of all consumer households in Darwin, were engaged in some form of fishing activity - Table 54.

TABLE 54: Households Engaged in Fishing Activity

FISHING ACTIVITY	ABSOLUTE FREQUENCIES	% OF ALL CONSUMER HOUSEHOLDS (n = 501)	% OF RESPONDENTS (n = 480)
Yes	219	43.7	45.6
No	261	52.1	54.4

Of the capital cities, Perth (45.6%) and Hobart (42.3%) have comparable figures, whilst the percentage was even higher in Canberra (51.5%). Among the other cities approximately a third of the households were engaged in a fishing activity (ibid DPI, p.36).

In some of the north and central Queensland towns the percentage engaged in a fishing activity was even higher - e.g. at Bowen, 71.0 percent. At Cairns, the percentage of fishing households was 40.0 percent, Rockhampton 37.0 percent, Mt. Isa and Charters Towers 24.0 percent each, Hughenden 28.0 percent and Mareeba 26.0 percent (Bandaranaike, 1981, p.28).

Thus among most households fishing is an accepted form of recreation and the contribution to total seafood consumption from this source, therefore, is very relevant. Most unfortunately there are no records maintained on total recreational catch statistics for a given area, mainly because of the difficulty of identifying all individual components of the catch. This results in official seafood production and per capita consumption statistics being grossly underestimated. The following section examines some of the main characteristics of these fishing households.

12.1 ETHNIC HOUSEHOLDS

TABLE 55: Fishing Households by Country of Ethnic Origin: Percentage Occasions

COUNTRY OF ETHNIC ORIGIN	TYPE OF HOUSEHOLDS	
	FISHING	NON FISHING
Australia	42.7	57.3
Asian	40.7	59.3
Adriatic	54.8	45.2
European	51.1	48.9
British	48.3	51.7
Other	62.5	37.5

Of the households engage in a fishing activity in Darwin, the Adriatic households comprise the largest sub-group (Table 55). 54.8 percent of the Adriatic (mainly Greek origin) households were engaged in a fishing activity*. More than half (51.1%) the European households mainly East Europeans were also engaged in fishing. 48.3 percent of the British households, 42.7 percent of Australian households and 40.7 percent of Asian households were engaged in a fishing activity. Even though the category 'other' had the highest percentage (62.5%) engaged in a fishing activity, this group cannot be taken into consideration in the analysis since it included a number of households with mixed ethnic origin.

12.2 RECREATIONAL AND COMMERCIAL FISHING

Of the fishing households, 86.3 percent were amateur or recreational fishermen, 3.7 percent were commercial fishermen and another 10.0 percent called themselves part recreational/commercial fishermen (Table 56). These were probably mainly amateur fishermen who admitted to selling part of their catch on the open market.

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* This confirms the pattern found in the other capital cities, where 46 percent of 'Greek households' had a member who went fishing (ibid DPI, p.37).

TABLE 56: Recreational and Commercial Fishing Activity

	ABSOLUTE FREQUENCIES	% OF FISHING HOUSEHOLDS (n = 219)	% OF HOUSEHOLDS (n = 501)
Recreational Fishing	189	86.3	37.7
Commercial Fishing	8	3.7	1.6
Part Recreational - Commercial Fishing	22	10.0	4.4

12.3 EXPERIENCE AND FREQUENCY IN FISHING

39.3 percent of those engaged in fishing had betwen one and ten years experience in a fishing activity. A further 34.2 percent had experience of between 11-20 years. The distribution of fishing experience among the households is seen in Table 57 below. Thus a great proportion of these fishermen have quite an outstanding record of 'fishing years' to support their activity.

TABLE 57: Fishing Experience

NO. OF YEARS EXPERIENCE	ABSOLUTE FREQUENCIES	% OF FISHING HOUSEHOLDS
Less than 1 Year	3	1.4
1-10 years	86	39.3
11-20 years	75	34.2
21-30 years	29	13.2
31-40 years	16	7.3
41-50 years	4	1.8
Greater than 50 years	2	1.0
Undeclared	4	1.8
TOTAL	219	100.0

Together with fishing experience it is relevant to consider the frequency of fishing trips among the householders - Table 59.

TABLE 58: Frequency of Amateur Fishing

ANNUAL FREQUENCIES	ABSOLUTE FREQUENCIES	% OF FISHING HOUSEHOLDS
Less than 10	104	47.5
10-19	43	19.5
20-39	50	22.8
40-59	15	6.8
60-79	2	1.0
Greater than 79	2	1.0
Undeclared	3	1.4
TOTAL	219	100.4

47.5 percent had a frequency of less than 10 times per year, a further 22.8 percent had a frequency of between 20 and 39 times per year. The latter group probably corresponds to the 'weekend fishermen' of Darwin and the former group were either the 'newcomers' to fishing or those fishing during public/school holidays only. Another 19.5 percent had a frequency of 10-19 times per year - probably a sub-group of the 'weekend fishermen'. Some of those with very high frequencies belonged to the category of commercial fishermen.

12.4 WEIGHT OF FISH CAUGHT

TABLE 59: Average Weight of Fish Caught Per Fishing Trip

ANNUAL FREQUENCIES	ABSOLUTE FREQUENCIES	% OF FISHING HOUSEHOLDS
0 kg	3	1.4
1-25 kg	127	58.0
26-50 kg	15	6.8
51-75 kg	2	1.0
76-100 kg	5	2.3
Greater than 100 kg	6	2.7
Weight Unidentified	61	27.8
TOTAL	219	100.0

The average weight of fish caught per trip for most households was between 1 and 25 kg. About a fourth of the fishing households were unable to identify the weight of their catches or were unwilling to record these in the survey - Table 59.

12.5 DISTRIBUTION OF CATCH

TABLE 60: Distribution of Catch

RESPONSE	DISTRIBUTION TO FRIENDS ETC.		HOUSEHOLD CONSUMPTION	
	ABSOLUTE FREQ.	RELATIVE FREQ.	ABSOLUTE FREQ.	RELATIVE FREQ.
Yes	133	60.7	208	95.0
No	86	39.3	11	5.0
Total Fishing Households	219	100.0	219	100.0

The fish caught was mainly (95.0%) for household consumption (Table 60). However, 60.7 percent of those households engaged in fishing activity distributed their catch to friends and relatives. This accounts for the relatively high percentage (47.3%) of fresh fish coming from the source 'friends or relatives' in Table 49. The 39.3 percent that did not distribute their catch to friends or relatives either marketed their catch or caught too few to distribute to others.

12.6 LOCATION OF FISHING ACTIVITY

TABLE 61: Location of Fishing Activity

FISHING LOCATION	ABSOLUTE FREQUENCIES	% OF RESPONSES	% OF FISHING HOUSEHOLDS (n = 219)
River Creek Lake Lagoon	125	39.2	57.1
Inshore Coastal	129	40.4	58.9
Offshore Coastal	65	20.4	29.7
TOTAL RESPONSES	319	100.0	

Almost equal numbers of fishing households fished in inshore coastal waters (58.9%), and in rivers, creeks, lakes and lagoons (57.1%). Just over a fourth fished further out at sea in the offshore coastal waters - Table 61.

The species of fish and shellfish caught obviously varied according to the location of fishing activity referred to above. Barramundi was the most sought species of fish caught by 64.6 percent of fishing households. Snapper was the next most popular, caught by 44.3 percent and Crabs were caught by a further 36.3 percent. The frequency of the top three species caught is reflected in the most consumed seafood species data, discussed in chapter 7.

Between 20 to 30 percent of households caught Red Emperor, Parrot Fish, Queenfish, Threadfin Salmon, Bream, Jewfish, Trevally, Spanish Mackerel and Cod. Even though Prawns were consumed by 68.6 percent of households only 9.9 percent of households reported this species in their total catch. Therefore, obviously the major source for Prawns is the retail outlet. The distribution of the other species caught is found in Table 62.

Thus this section illustrates the significance of fishing households in Darwin and their potential contribution to the industry. At the same time there are management implications with reference to the major species of fish and shellfish caught by these households. Further research should therefore be directed in this field to find out the current impact on consumption and future requirements of the amateur fishing activity of Darwin.

TABLE 62: Major Species of Fish and Shellfish Caught By Fishing Households

SPECIES	% OF FISHING HOUSEHOLDS (n = 212[1])
Barramundi	64.6
Snapper	44.3
Crabs	36.3
Red Emperor	29.2
Parrot Fish	28.8
Queenfish (Skinny)	28.3
Threadfin Salmon	27.4
Bream	25.0
Jewfish	24.1
Trevally	23.6
Spanish Mackerel	21.2
Cod	20.8
Catfish (Moonfish)	18.9
Shark	17.0
Sweetlip	16.5
Estuarine Rock Cod	16.0
Coral Trout	15.1
Stripey	14.6
Mullet	11.8
Whiting	9.9
Prawns	9.9
Mangrove Jack	9.0
Turrum	8.5
Grunter	6.1
Red Finned Emperor	6.1
Sea Perch	5.7
Flathead	4.7
Barracuda	4.2
Reef Fish	3.8
Stingray	3.3
Oysters	2.8
Tuna	2.8
Butterfish	2.4
Spanish Flag	1.9
Squid	1.9
Other[2]	10.4

1 3.2% of the fishing households were unable to identify the species caught.

2 Bugs; Flounder; Ock Ock; Kina (NZ) Sardines; Scallops; Cherabin; Yabbies; Lobsters; Oxe-eye Herring; Clams; Troca Shells; Red Salmon; Angel Fish; White Bait; (contribution 3-1% each).

CHAPTER 13. THE ABORIGINAL HOUSEHOLD

Since the population characteristics of the full-blooded Aboriginal households were somewhat different from the rest, a sub-sample was taken from the Bagot Community Centre of Darwin and the results are presented in this section. Where relevant, comparisons are made with the urban Aboriginal Islander community living within Darwin.

13.1 BACKGROUND INFORMATION

The Bagot Aboriginal community is one of many centres set aside for the development of Aboriginal communities within urban areas. Other Aboriginal communities are found at Humpty Doo, Beleuven, Kulakak, Berrimah Kennely's lagoon and at Railway Dam - the latter two for transient aborigines.

At the Bagot Centre, services such as a community council, adult education, a health clinic, a retail store, transport service and hair dressing were available.

Accommodation was provided by way of masonary block houses consisting of four bedrooms with a rental of $50.00 per week (1982). Altogether there were about thirty older dwellings and a further twenty being built at the end of 1982. Originally furnished houses were supplied with replacements to be done by the tennant. Owing to cut backs in the council grant, the relatively newer houses remained unfurnished. Typical furniture contained in a house was a fridge, washing machine, a lounge suite, beds, tables and chairs, cooker and a television.

Interviews were conducted personally by the researcher. The secretary at the Community Centre helped to select the sample households. Those households where participation in the interview was difficult owing to communication problems, were left out. Altogether a sample of twelve households was taken from this centre which is approximately a forty percent sample.

13.2 SOCIO-ECONOMIC CHARACTERISTICS

Considerable difficulty was encountered in collecting data on the socio-economic characteristics of the households. A brief summary of these characteristics is presented here. However, correlations between household characteristics and consumption habits or purchasing patterns were not possible owing to the above fact.

On the average each household had about four adults, four to eight children and a few relatives as well living under the same roof. Some of these houses had pensioners living with them and a few had grandchildren

living with them. Most were unemployed and a few did casual work or were employed within the community centre. Incomes were usually very low - less than $8,000 per annum. Among most, education was at the primary level and only a few had secondary education. All were full blood aborigines belonging mainly to the Australian Inland Mission Uniting Church and a few to the Roman Catholic Church.

13.3 SEAFOOD CONSUMPTION CHARACTERISTICS

It is noteworthy that all households (100.0 percent) within the Bagot community consumed some form or other of seafood at home. This compares with 95.8 percent for the rest of the households sampled in Darwin. Fresh and canned seafood were consumed by 100 percent of the households. Frozen pre-packaged seafood was consumed by 66.6 percent and smoked seafood consumed by only 16.6 percent of households. 83.3 percent of households consumed seafood outside the home. Thus, as in the case of the majority of the Darwin population, the Bagot Community households' major preferences were for fresh and canned seafood. However, the Aboriginal/Islander households* of Darwin had a slightly different emphasis on the different forms of seafood. Whilst 100.0 percent of households consumed fresh seafood, only 20.0 percent consumed canned and frozen pre-packaged seafood and none consumed smoked seafood. 100.0 percent of the households also ate outside the home.

Of the fresh fish consumed Bream (83.3%) was the most popular, followed by Barramundi, Catfish and Skinny (each 50.0%). Stingray was consumed by 33.3 percent households and a few other households consumed Snapper, Butterfish, Salmon, Whiting, and Freshwater Shark. Mud crabs (100.0%) were the most consumed fresh shellfish species followed by Prawns (33.3%). In contrast, 30.0 percent of the Aboriginal/Islander households consumed Barramundi, Threadfin Salmon, Snapper and Crabs. Bream was consumed by only 20.0 percent, Skinny by 60.0 percent and Catfish by none, thus indicating completely different preferences between the Bagot Aboriginal Community and the urban Aboriginal/Islander Community. It is obvious that the eating habits of the latter group have been strongly influenced by the rest of the urban residents of Darwin.

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* These results were presented in the preliminary analysis of the survey data, November 1982 at a NARU Seminar. Subsequently they have been incorporated with the 'Australian' group, when identifying ethnic origin.

It was most difficult to assess the quantity of fresh seafood served at a household meal, among the Bagot Community. Answers were recorded in terms of whole fish or shellfish portions. Yet no indication could be given regarding the average weights of these portions. For example, "one large" Barramundi was shared among households with either six persons or ten persons; "two" catfish among seven persons or 3-4 crabs among a household of ten, one crab among a household of five etc. On the average the portions consumed per head were smaller than the rest of the population. However, the frequency of consumption was much higher. A third of the Bagot households had a frequency of consuming fresh seafood at least once a day during the dry season. During the wet season, owing to difficulty of access to the billabongs, fishing activity temporarily ceased. During this period there was greater consumption of meat or poultry. Another third of the households had a frequency of four times per month and another third, sixteen times per month.

Fish fingers was the most popular form of frozen pre-packaged seafood followed by fish cakes and scallops. Fish fingers were consumed mainly by the younger children of the household. On an average, each child consumed about three fish fingers each at a meal. The frequency of consumption was between two and four times per month. The per head consumption of this form therefore, was approximately similar to the rest of the Darwin households.

Of the smoked/dried species, dried cuttlefish was consumed the most. The majority of households in Bagot, did not consume smoked/dried seafood since they did not like the taste or they preferred fresh seafood. The frequency of consumption of smoked/dried seafood was less than once a month.

Canned fish on the other hand, was consumed about four times per month. Sardines were consumed by 100.0 percent of the households, Salmon, Herring and Oysters each by 50 percent of the households. Mussels were less popular. The per head consumption was approximately between 50-100 grams and the frequency between 1-4 times per month.

The major difference between the Bagot Aboriginal Community and the rest of the Darwin households is that seafood was by far the most important form of food among the former group. Meat and Poultry (mainly geese and duck) were consumed only as substitutes for seafood during the off-season. Also, poultry was more frequently served in the Bagot Community household than meat.

13.4 SEAFOOD PURCHASING CHARACTERISTICS

A considerable proportion of the seafood and game consumed within Bagot was hunted by the householders themselves - discussed more fully in chapter 13 section 5. The main source of purchase for fresh seafood was the mobile van (83.3%). In addition, fish was also caught by the household and received from friends and relatives. The mobile fish van was a very popular source, since credit was allowed on purchases until pay day and most households were very satisfied with the quality of the fish sold. This was therefore, a very convenient arrangement for the Bagot householders.

As in the rest of Darwin, the chain supermarket was the main source of purchase for the other forms of seafood, followed by the local supermarket.

When purchasing fresh seafood, the first preference was for whole fish and then fillets. Very often the fish was cooked in its whole form or the fish head made use of in soup. "Namas" was a popular form of preparing fresh seafood - i.e. fish is sliced, soaked in vinegar and eaten raw. Cooking fish on ashes or coal was also very popular. Baking and frying were the next most popular. Thus owing to the different preparations of seafood, by the Bagot Community households, the major purchase preference for seafood was 'whole'.

There were few complaints regarding the seafood purchased such as high price, not fresh and the unavailability of filleted Whiting and Mullet at the local supermarket.

13.5 FISHING ACTIVITY OF HOUSEHOLDS

Two-thirds of the households sampled in the Bagot Community had one or more members of their household engaged in fishing activity. Among the Aboriginal and Islander households in the Darwin urban area, there too was as much as 60 percent of households engaged in a fishing activity and having a higher frequency than other ethnic groups (Table 55).

Fifty percent of the Bagot households were engaged in fishing almost every day except during very wet weather. The remaining households fished only during dry weather. Thus to many members of the Bagot Community fishing was almost a livelihood. The entire household, men, women and children, all went fishing. Often women and children went together as a group and the men formed a separate group. Fish and shellfish caught were mainly for home consumption: a small proportion of the catch was distributed among friends and relatives.

The average weight of fish caught per fishing trip varied between one kilogram and thirty kilograms, being very similar to other fishing households of Darwin (Table 59). Barramundi and Mud Crabs were the most frequently caught species, followed by Catfish. Other commonly caught species were Bream (wet season only), freshwater Mullet, Stingray, Mangrove Snapper, Lobsters, Oysters and Prawns (beginning of the wet season).

Most of the fishing activity was concentrated in inland water areas such as rivers, creeks, lakes and lagoons (billabongs). Since fishing was more than a 'way of life' to the members of the Bagot Community, it is not uncommon to find them engaged in a fishing activity from early childhood. Thus the average experience in fishing was much higher (30 to 40 years) than that for the rest of Darwin (Table 57).

13.6 GENERAL CONSUMPTION CHARACTERISTICS

13.6.1 DAY OF THE WEEK

When questioned on the 'Day of the Week' seafood was most frequently served, the respondents stated they were unsure of the days when specific forms of seafood were served. However, in the course of the conversation it was gathered that fresh fish was eaten almost everyday in those households that were engaged in fishing activity throughout the year - i.e. 50.0 percent of the fishing households.

13.6.2 MEAL PREFERENCES

The rate of response was much better when asked at which meal different forms of seafood were served in the household. On 83.3 percent of the occasions fresh fish was served at the evening meal. On a third of the occasions it was served at breakfast (left-overs from the evening meal) and a few households (16.6%) served it at the mid-day meal. The pattern of serving fresh shellfish was much the same as for fresh fish. Canned fish and shellfish were served mainly at the mid-day meal and frozen pre-packaged fish, particularly fish fingers, served mainly at breakfast.

13.6.3 TAKEAWAY OUTLETS AND RESTAURANTS

On the whole, Takeaway outlets were patronised more often than Restaurants by the Bagot Community. The frequency was usually between one and two times per month and was used mainly by children - i.e. fish and chips meals. A few who did not eat at these Takeaway outlets stated they feared shark was being served at these places. A small minority (16.6%) of households used Restaurants, mainly to consume Barramundi. The frequency of usage, however, was less than once a month.

13.6.4 WILLINGNESS TO TRY NEW SPECIES

When testing the attitudes to seafood consumption among this community it was found that the majority (66.6%) of the households were willing to try new species in the market, if introduced at reasonable prices. This response was rather encouraging coming from a traditional society.

13.6.5 EFFECTS OF CIGUATERA KNOWLEDGE

Only about a third of the households sampled had even heard of ciguatera poisoning and these same households stated their seafood consumption habits were not adversely affected by this knowledge. A few households stated they had heard of 'stonefish poisoning', but the majority were unaware of ciguatera.

Thus overall the Bagot Aboriginal Community comprised a very special segment of the seafood market and contributed much to the fishing activity of amateur households.

CHAPTER 14. A LOOK TO THE FUTURE

This section examines some of the marketing strategies available to the Darwin seafood industry in the context of the research conducted.

Marketing is the performance of all business activities involved in the flow of goods and services from the point of initial production until they are in the hands of the ultimate consumer. Therefore, marketing examines people's wants and from this assesses the direction of production, the selling, packaging and distribution of products. These wants in turn are dependent on the image of the product created in the customers' minds via promotion and price. Marketing management is the analysis, planning, implementation and control of programs directed at giving maximum satisfaction to the consumer and profitability to the firm.

In marketing a product, it must be recognised that the act of consumption commences well before a product is purchased and extends well beyond it. Four stages are recognised in this process:

i) the development and perception of a want or need;

ii) pre-purchase planning and decision making;

iii) the purchase act itself;

iv) post-purchase behaviour which may lead to repeat buying.

In order to satisfy the above requirements, certain strategies are required in marketing a product, as identified below:

(a) Firms need to innovate by developing products which satisfy needs for which there is currently no adequate market offering. Stimulation of existing wants through advertising and sales promotion is also needed, e.g. even impulse buying requires some kind of stimulus. These could be related to hitherto unexploited, under-exploited or unpopular varieties of seafood.

(b) Advertising together with personal contact is important because consumers could be misinformed regarding products - such as the association of ciguatera poisoning with all reef fish, or misconceptions regarding frozen fish.

(c) The purchasing act involves a number of sub-decisions regarding time and place, convenience in car parking, cash sale, and store

purchase or home delivery. Other factors influencing this stage are: prices of competitive products, ready availability of, or access to the product, variety and display, quality, and distinctiveness.

(d) After sales service is required in order to establish confidence in the product purchased. In the case of seafood this would be associated with cooking demonstrations, provision of recipe booklets, introduction of new products at special prices etc.

Seafood marketers must know: how much of the product to release, at what time of the year to market the product, which species/brands to market, preferences of consumers and the form to be released such as fresh, frozen, smoked or canned - all this depends on knowledge of consumer behaviour which has been dealt with in chapters 4 - 13 of this report.

Consumer decisions are at least partially subject to some order. To a large extent they act rationally. Often tastes change, and sometimes rapidly, but there are reasons underlying these changes. Consumers make decisions with a structure that permits partial predictions of outcomes. This report therefore looks at consumer behaviour with a view to improving predictions concerning what products consumers will buy and under what conditions they will buy them. The more accurate the predictions of consumer response, the greater the potential for efficiency in the production and distribution of seafood.

Since the first four objectives set out in this research project (p.4-5) are related they will be discussed in conjunction with each other. Considering the present rate of population growth in Darwin it is conceivable that the total demand for seafood products would increase at the current levels of growth for at least a further five years. Owing to the general physical and economic isolation of the north, unprecedent growth in population numbers cannot be predicted in the near future, if at all. It is possible that the current growth rate of 5.5 percent per annum may decline to between 3 and 4 percent within the next decade. This is taking into consideration the tributary development in satellite cities such as Palmerston. This situation, however, can change in the event of new economic ventures being introduced to Darwin.

RECOMMENDATION (i)

Under the circumstances (assuming increased production) it will be advisable whilst catering to the local demand, to increase seafood export opportunities both with the rest of Australia and overseas markets. Darwin's geographical proximity to the Asian markets together with the demand for high protein diets in these countries should be exploited more fully.

The export market could concentrate on the current species as well as the possibility of introducing new species, particularly those that are caught locally in relatively large numbers and have a poor local demand - e.g. shark. In the local market, species with a large demand as identified in this report should be made readily available to the local consumer.

RECOMMENDATION (ii)

Regional variations in population growth were observed within Darwin. These should be carefully monitored by seafood retailers when locating retail outlets.

RECOMMENDATION (iii)

Increased urbanization with changing lifestyles which is characteristics of all Australian cities is an important factor when determining the physical properties of the product sold. For example, there is an increased demand for smaller packages and more prepared and semi-prepared food.

The population structure of Darwin is also an important determinant of market conditions. Owing to the relatively young population - that is, 41.5 percent being between 15 and 35 years of age - it is assumed marketing innovations may be readily introduced leading to increased per capita consumption of seafood in the future. However, it also means that in another twenty years time, it will be necessary to cater to an equally large group of consumers between 35 and 55 years of age who may require different properties in the seafood products they consume.

RECOMMENDATION (iv)

In measuring market potential not only numbers but the income per square kilometer of area is also important. For many goods demand increases as income rises. However, at higher income levels a smaller proportion of the total income is used on the purchase of necessities, and consequently purchases of non-essentials rise. It must be noted that within the broad category of seafood, there are some species which are considered 'luxuries' because of high price (e.g. prawns) and the others considered 'basic necessities' (e.g. skinny).

As a rule, consumers tend to eat more expensive foods when incomes increase and plainer foods when incomes decrease. Research in the United States shows that as incomes rise, the percentage spent on food decreases. This by no means reflects a fall in the per capita food consumption. On the contrary, consumers are constantly upgrading their diets through the purchase of more expensive foods. This developing relationship is of major importance to both fishermen and the seafood industries. Augmentation of consumer income will not improve the income very much of fishermen from their primary produce. Most additional money allocated to food will contribute largely to the marketing firms that are adding services and 'attributes' to the raw material. This in turn means that markets will have to be exploited continually.

In terms of marketing seafood the proportion of the household budget spent on meat and fish is relatively low - that is 8.36 percent. Of this it can be assumed that among most families more than half of this would be spent on meat purchases and between 2 to 3 percent of the total household budget on seafood purchases. In order to cater to varying demand among the different income groups, a useful marketing strategy would be to vary the image of seafood among these groups. That is, build the image of seafood as a 'basic necessity' among the lower income earners and attach a prestige image together with a greater service and processing component to the more expensive species such as barramundi, prawns, lobsters etc. in order to promote its sales as a 'luxury' item among the relatively higher income earners. In Darwin, it was noted (p.22) that more than half the household incomes were above $18,000 per annum and less than eight percent below $8,000.

RECOMMENDATION (v)

Australian culture has been strongly influenced by other cultures. This has an impact on types of seafood products consumed, frequency of consumption, methods of preparing seafood and the general attitude to seafood products.

Australian culture has been most strongly influenced by British culture. In Darwin, however, because of the multi-cultured society the impact of different cultures is visible more than in any other Australian city. Almost a quarter of the Darwin population is overseas born. This ethnic component in Darwin could be used advantageously in seafood marketing. For example, different methods of preparing seafood could be adopted from diverse nationalities. At the same time some of the species which are more popular among the non-Australians may be introduced to the market - some examples being squid or cuttlefish, ikanbilis (sometimes sold as 'white bait') goat fish, bonito etc.

RECOMMENDATION (vi)

In marketing management it is necessary to maintain the levels of satisfaction among the existing consumers, and at the same time convince the non-consumers of the utility of the product being sold. Non-consumption could be a result of the prevalence of substitutes, difficulties in the acceptance of the product itself, or an outcome of its functional value to the consumer - such as convenience, availability, preference of handling or packaging. Of those households that do not consume any form of seafood more than half stated they either prefer meat to seafood, or they were not accustomed to eating seafood. This situation could be changed through advertising. Advertising is intended to inform the market, and persuade the consumers to use a specific product or service. This is discussed in further detail under recommendation (xvi).

Currently, there is an increasing demand for fresh fish and shellfish. It is possible that in the near future the demand for frozen pre-packaged seafoods in convenient size packages will increase owing to changing lifestyles - such as greater urbanization and increased female participation in the workforce. At the same time it is also necessary to maintain the current levels of consumption in the fresh fish and shellfish market.

The most preferred varieties of seafood of the Darwin consumer have been discussed in this research (chapter 7 section 6). Even though prawns and barramundi are some of the most expensive species of seafood it is obvious from Tables 29 and 36 that there is a very high demand for these species. Therefore, retailers should make every effort to have a continuous supply of these and other fresh seafood species available at a reasonable price throughout the year.

RECOMMENDATION (vii)

It is also desirable that some of the local Northern Territory species which are not so popular at present, be gradually introduced into the market. This would probably reduce the pressure on the more popular species in demand. Seasonal availability of species should be exploited more fully in the marketing of seafood.

RECOMMENDATION (viii)

It must be noted that slightly different approaches are required for the marketing of different forms of seafood. For instance, in the marketing of fresh seafood, the fresh quality of the product as reflected in the sale of unfrozen fresh fish as opposed to fresh/frozen fish is of prime importance to consumers.

Compared with most other food products, fish is both perishable and bulky. As such it affects marketing functions concerned with physical handling. Bulkiness including seasonal variations in production require large storage capacities. Deterioration in quality will result if these conditions are not adhered to. In the interest of the fishing industry and the consumer it will be necessary for fisheries inspectors to examine frequently the freshness of seafood products sold at retail outlets.

RECOMMENDATION (ix)

In frozen pre-packaged seafood consumers demand convenient size packages for individual thawing and at the same time a product that has been frozen at a constant temperature.

RECOMMENDATION (x)

In smoked or cured seafood greatest concern among the consumers was with reference to the curing technique, which was suspected of being chemically contaminated. Eradication of doubts expressed, together with the inclusion of easy recipes for cooking the smoked/cured seafood should resolve this problem. In the event of the product being imported with no directions for preparation of the product, the local marketers should take the initiative to attach suitable recipes prior to retailing the product. Canned requirements once again are associated more with suitable size of can and range of products.

RECOMMENDATION (xi) AND (xii)

It was observed through the survey conducted that quite a significant proportion of consumers were unable to identify the species of seafood pruchased and in some cases, even the species caught whilst engaged in amateur fishing activities. In order to create a greater interest and awareness of the fish and shellfish market, large poster displays of common fish caught and sold in the Northern Territory should be displayed at all seafood retail outlets. This could be followed up by conducting a television programme on these same species with additional information on their habitat, physical characteristics and culinary potential. This would also partly overcome the problem of 'misnamed fish' in the market. The actual labelling of fish and shellfish at retail outlets should be supervised on a random basis by fisheries inspectors.

RECOMMENDATION (xiii)

Shopper attraction is an important feature in potential sales. The volume of sales in a retail store depends on the ability to attract customers as well as the ability to retain those attracted and covert them to

consumers. The most important factor in attracting a potential consumer to a retail store is the overall store image (perception) built up from personal experience, comments of others, and promotion. This perception may be of the most 'prestigious' or 'fashionable' place to shop, a convenient place to shop (with ease of parking), or a place where the customer is likely to find what he or she wants. Other factors that may attract potential customers are advertised promotional events, the availability of extra services (such as filleting or slicing of the preferred species purchased), convenience (extended shopping hours) and special merchandise (availability of imported seafood products). Usually some combination of these attractions will be able to draw a customer to a store.

With reference to Darwin, some of the following suggestions per se or modified may be successful in achieving shopper attraction and promoting the store image:

i) A 'seafood supermarket' to be introduced and located either in the Casuarina or Nightcliff shopping complex. This suggested store would carry a wide range of all forms of seafood (fresh, frozen, canned, smoked etc.) and ensure that variety in species is made available throughout the year. High standards of packaging and handling together with attractive display cabinets, where the displays are changed twice a day should be a feature of this store. This should encourage high quality seafood to be made available. The consumer should perceive this supermarket as a convenient 'one stop' shopping for general grocery shopping as well, as a consequence of its proximity to other shops in the Casuarina or Nightcliff shopping complex.

ii) Introduce a 'seafood delicatessen' at a fashionable site preferably within the Darwin mall, in order that it may attract tourists as well. This store will also be expected to carry a wide range of products, but somewhat more restricted, nevertheless more exclusive, than for the 'seafood supermarket'. As a major attraction shop assistants could be dressed as mermaids! As time progresses a seafood restaurant could be attached to this complex.

More generally, most of the existing fish retail shops need to improve greatly on their interior as well as exterior decor. Windows and display cabinets should be dressed appropriately in a 'seafood environment'. In many of the existing stores, the floor covering and walls have been totally neglected. Retailers should concentrate more on creating an environment of being underwater or anything associated with the sea, rather than have pinball machines or lolly dispensers within their shops.

RECOMMENDATION (xiv)

It was noted from the survey results that price was not a major factor inhibiting the consumption of seafood. The analysis carried out on income variation and seafood consumption in chapter 6 supports this view. Seafood marketers should direct their attention more toward changing life styles in the future, availability and presentation of the product and certain related socio-economic variables such as ethnic diversity.

Yet, price is a significant factor in the process of decision making. As such, competitive prices should be made available among seafood products. Two pricing strategies that may be effectively used in seafood marketing are suggested here together with their advantages and disadvantages.

The Dual Pricing system refers to the practice of maintaining conventional pricing practices as well as unit pricing - that is, price is stated per ounce or per serving. This is referred to as Compare-A-Buy (CAB) programme. It was originally intended as an aid for lower income shoppers who were encouraged to compare size and not so much the species sold. This system may be suited for introducing new species to the market and/or to be employed in low income areas.

Multiple-Unit Pricing is a practice of pricing items in multiple-unit quantities, such as 5 for 89 cents. This is effective in increasing immediate sales. However, whether it increases the rate of product consumption or merely encourages the consumer to accumulate for future use, has apparently not been determined. It is possible that this method could be used with smaller size fish or shellfish. It would be a particularly useful strategy in times of glut to get rid of the excess fish or shellfish.

However, in adopting any pricing system it has to be sufficiently easy to understand - e.g. 6 for 60 cents and not 6 for 53 cents. Customers perceive quantity buying as involving greater savings. Therefore multiple-unit pricing may be an effective way on increasing the volume of sales. Yet, the bargain concept of multiple pricing appears to reach its peak within about the five dollar limit in the case of seafood. Further, even with these pricing concessions the sale of a product is influenced by neighbouring products of various sizes all of which compete for the shoppers' attraction.

RECOMMENDATION (xv)

The food industry is highly competitive, and as such new market opportunities should be continuously evaluated among consumer groups with unsatisfied demands. The industry should be able to firstly, recognise hitherto unmet demands, such as of new

migrant communities or that of a particular age group. Secondly, it should assess whether those demands will be expressed as economically feasible markets - that is, backed by purchasing power. Finally, it must determine what organisational response is required for success in selling to those demands.

In an economically advanced society such as that of Australia, one cannot simply provide more of what is already being consumed. Once subsistence level is reached it becomes more difficult to determine new market opportunities, such as geographic mobility, social mobility and psychic mobility.

In the case of interstate migrants or overseas migrants to Darwin, people are now living (in Darwin) where they did not live before, thus creating new markets. They have abandoned past preferences and are seeking consumption information on new sources. It is the latter that should be exploited more fully by retailers.

Social mobility is a result of greater education and the acquisition of a more sophisticated milieu which results in a change of interests and participation in increased social interaction. Thus social positions change for groups of individuals as well as for individuals within groups hence throwing open markets previously confined to other consumer groups.

Market research also acknowledges what is called psychic mobility. This is when people often express themselves more fully or change their conception of themselves and their environment. In modern society personality is free to deviate from rigidly prescribed social standards, and people are able to express their desires in many new ways. These opportunities should be once again, exploited more fully by marketers.

From the foregoing analysis it is noted that personal preferences for products vary widely. The challenge of market segmentation is to determine groups of people whose preferences are sufficiently similar to each other, yet different from other groups, to justify modification or introduction of a product to suit the preferences of that specific group. The survey analysis clearly indicated segments of the Darwin population with specific preferences. It is these personal preferences that should be satisfied in order to exploit the market more fully.

RECOMMENDATION (xvi)

It is the researcher's belief that in the seafood industry adequate attention has not been paid to advertising the product effectively. The purpose of advertising is to stimulate the consumer to thought and action or produce pre-dispositions to buy the

advertised product. Even though the goal of all advertising is to make a sale, this is not always guaranteed.

With reference to the seafood industry, advertising can be used more effectively in the following ways:

i) To make use of newspapers to advertise bargain-priced products or special deals in order to induce immediate purchase.

ii) In order to announce the introduction of new species, a new method of cooking poor quality fish, a change in price or a change in package design the television and radio should be exploited more fully. This type of advertising is mainly to create general awareness of any innovation in the industry.

iii) Sometimes advertising is used to create, enforce or change an image of a product. It is here that the image of fish and shellfish should be promoted for diet conscious consumers in the market. That is emphasis in the advertising campaign of the nutritional value, low cholesterol content, high virility and high fertility rate (as believed among some communities) and the low calorie content of seafood. It may also be used effectively to change the image of a particular species of seafood.

For example, white bait is widely used as fish bait. Yet, among some communities white bait is a delicacy when properly cooked as a meal. In this manner species diversification can be achieved gradually over a period of time.

Tourists coming into the Northern Territory should be made more aware of the seafood potential of the North. One method of achieving this is locating Bill Boards (Advertising Boards) at strategic points on the highway, similar to the advertising of hotel and motel accommodation. These boards could have slogans such as 'You are now entering barramundi country' or '..... king prawn country'.

In order to capture the local market, advertising should be directed at the new 'ockerism cult' which is reflected in the advertising themes of most other Australian products. One suggestion in this direction would be to have a small label with the Australian national flag or the Northern Territory flag printed and 'caught and processed in Australia/Northern Territory' written on it.

More generally, the advertising campaign could take the form of a whole month set aside for the intensive promotion of seafood and entitled 'Seafood Month'.

During this period competitions should be conducted for all age groups varying from literary and artistic competitions to the compilation of recipes, all associated with promoting seafood consumption. Posters, video recordings, film strips, seafood sampling sessions and cookery demonstrations should be carried out at strategic points such as the Casuarina shopping complex and the downtown Darwin mall.

RECOMMENDATION (xvii)

It was apparent from the survey that 84.8 percent for the consumers ate fish and shellfish outside the home (chapter 9), thus emphasising the importance of the insitutional market for seafood. Research in countries like America has indicated that this is a growing trend. Therefore it is anticipated that in the future, the institutional market for seafood will certainly increase in importance. However, at the same time there will be competition within the institutional market from other food products, particularly from the American chain of food franchises such as Kentucky Fried Chicken, MacDonalds, Hungry Jacks and the Pizza Huts. In order to compete with these established food chains it will be necessary to organise a seafood chain restaurants similar to the 'Mariner' seafood restaurants of Queensland. With Darwin's ready access to some of the most preferred species of seafood in Australia, this venture seems very plausible. Such a chain of restuarants could initially commence with the Northern Territory and later expand to other States or even to south-east Asia, with time.

Institutional buyers, purchasing seafood for restaurants, clubs and fast food outlets have a somewhat different demand from the consumer household. They are increasingly interested in portion control, standardization, labour saving and general availability. Some of the major factors sought by institutional buyers of seafood are: continuity of supply, price competitiveness, availability of the product in the form suitable for handling in bulk and for subdivision into smaller units, easy storage, the capacity to be cooked and reheated rapidly and ability to meet certain minimum specifications of the consumer such as a minimum bone content, fresh quality etc.

Even though at present, the population of Darwin is only a fraction of that of other Australian capital cities, there is undoubtedly a great potential for the institutional market for seafood in Darwin. Despite the small population, Darwin has one of the highest rates of population growth in Australia - 4.5 percent (ABS, 1981). Further, Darwin being the northern most international airport of Australia also has the advantage of large numbers of tourists passing through the region who are most likely to patronise restaurants, clubs and even fast food outlets.

Therefore the institutional market together with the household market should be developed with appropriate management techniques.

RECOMMENDATION (xviii)

Finally, the importance of the amateur fishing household cannot be overlooked in the Darwin economy. Increasing numbers of locals as well as interstate visitors are becoming involved in amateur fishing in the Darwin region. At the time of the survey 43.7 percent of the population were engaged in fishing activity. Based on past records the researcher estimates that by the end of this century there will be as much as 52 to 57 percent of the total population engaged in recreational fishing on the existing terms of reference.

In the past, amateur fishing in the Northern Territory has been encouraged in terms of providing recreation and being of economic value in promoting tourism in the area. However, it is the researcher's view that this initial impetus given to the industry must be reviewed immediately in the interest of preserving stock, particularly Barramundi, and to minimise the growing conflict between the amateur and commercial Barramundi fishermen. The latter obviously depend on this form of fishing for their entire livelihood. Besides, the estimates of amateur fishing catch made in this survey, the only other information available is through the research conducted by D L Grey and R K Griffin on amateur fishing in the Arnhem highway region. As outlined in the latter report there are obvious difficulties of monitoring the catch. Currently, amateur fishing is most popular in the rivers flowing into the Van Diemen Gulf, and at Daly, Finnis, Roper, Victoria and McArthur Rivers. There is an immediate need to research further into the amateur fisheries of the Northern Territory mainly because it effects a large proportion of the population and has concealed effects on the Northern economy.

In the light of the above survey, it may be necessary to implement fishing legislation similar to that found in the Northern Territory Fisheries Act relating to licencing of amateur fishermen whose annual catch is above a given level, regulation of gear, setting minimum legal sizes for fish caught, provision of closed seasons/closed areas and the maintenance of log books to record catch. It may also be necessary to investigate alternate areas for fishing and alternate species to be fished in order to maintain the continued interests of the tourists.

Given the resource availability of the North and the potential demand, the Northern Territory fishing industry could be developed on par with any other State fishing industry. Further, it has the additional

advantage of being located in close proximity to the immediate overseas markets of Asia and so facilitates the export of seafood.

In any industry competition is always present. Therefore there must be continual improvement in the efficiency of the strategy and tactics employed by successful marketers. The fishing industry cannot be considered separate, but as a part of the entire economy of the North. Therefore marketing strategies as suggested in this report must be viewed and implemented in this context.

SUMMARY OF RECOMMENDATIONS (details in Chapter 14)

i) Whilst catering to the local demand, seafood export opportunities should be increased both within and outside Australia. Further research to identify the export potential of local species is needed.

ii) Identify growth areas within Darwin prior to establshing seafood retail outlets. Within these catchment areas the type of market for particular forms/species of seafood should also be identified.

iii) The greater need must be recognised to pay attention to the changing life styles of the urban Darwinite and the population structure of Darwin when determining the 'physical properties' of the product sold.

iv) Seafood species should be differentiated according to market price and advertised accordingly among the different market segments. Further research to be conducted into new species and non-traditional species acceptable to the consumer.

v) In view of the paucity of methods used in preparing seafood, the experience of the multi-cultural society living in Darwin should be exploited fully. Cookery demonstrations to be held regularly either on television or at popular shopping complexes or use both in rotation.

vi) In order to maintain the current levels of consumption in the fresh fish and shellfish market and to prevent substitution by other competing products, it is important to guarantee a continuous supply of fresh quality seafood into the Darwin market.

vii) Seasonal availability of seafood species to be exploited fully in the marketing of seafood with greater emphasis on the sale of local species.

viii) With respect to the maintenance of high quality in the sale of fresh seafood, there is a need for constant surveillance of this product at retail outlets by fisheries inspectors.

ix) In order to familiarise and educate the average consumer, poster displays of common fish caught and sold in the Northern Territory should be displayed at all seafood outlets. Consumer education to be extended further via the media.

x) Improve the general 'image' of the seafood retail outlet to achieve shopper attraction - the establishment of a seafood supermarket or a seafood delicatessen.

xi) The introduction of new pricing strategies is needed to make the product more attractive and combat competition from competing food products - e.g. Dual Pricing, Multiple Unit Pricing.

xii) New market opportunities should be continually evaluated among new consumers and those with unsatisfied demands. Attention should be given to changes occurring from geographic, social and psychic mobility.

xiii) The need to pay greater attention to advertising of the product, both locally and overseas should be recognised. Promotion through a seafood month may be adopted.

xiv) Develop the institutional market for seafood with the possible establishment of seafood chain restaurants, initially within the Northern Territory

xv) This is a need to research further into amateur fishing in the Northern Territory taking into consideration both social and economic aspects, and the implementation of management measures based on this research.

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APPENDIX I

SOCIO-ECONOMIC BACKGROUND OF POPULATION

APPENDIX I

TABLE A1: DWELLING TYPE

TYPE	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY (%)
House	398	79.4
Flat	103	20.6
TOTAL	501	100.0

TABLE A2: HOUSEHOLD COMPOSITION

GROUPS	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY (%)
Single adults	59	11.8
Adult groups	127	25.3
Adult + 1 or 3 children	188	37.5
Adult + 2 children	90	18.0
Mixed groups	37	7.4
TOTAL	501	100.0

The groups identified in Table A2 were classified in the following manner:

HOUSEHOLD COMPOSITION

Group Name		Identification
(i)	Single Adults	Adult Males Adult Females These individuals occupy a single household.
(ii)	Adult Groups	Households with two or more adults living together as a unit.
(iii)	Adults + 1 or 2 children	Here an adult could be parents, grandparents, older (employed) sisters or brothers with 1 or 2 children living in the same household.
(iv)	Adults + 2 children	Adults as defined above, with 3 or more children.
(v)	Mixed Groups	Groups of adults and children that do not fall into the above categories.

ADULT

Any person over the age of 17 in full-time employment.

CHILD

Anyone under the age of 18 not in full-time employment.

A "household" is defined as a group of people (or individuals) living together and sharing common expenses including food.

TABLE A3: NUMBER OF PERSONS PER HOUSEHOLD

PERSONS	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY (%)
One person	40	8.0
2-3	203	40.5
4-5	223	44.5
6-7	30	6.0
more than 7	5	1.0
TOTAL	501	100.0

TABLE A4: NUMBER OF PERSONS EMPLOYED PER HOUSEHOLD

PERSONS	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY (%)
None	18	3.6
One person	192	38.3
2-4 persons	284	56.7
5-7 persons	6	1.2
more than 7 persons	1	0.2
TOTAL	501	100.0

NB The above data was used mainly as a cross check for calculating household income.

TABLE A5: HIGHEST LEVEL OF EDUCATION ACHIEVED

PERSONS	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY (%)
None	1	0.2
Primary	16	3.2
Secondary	294	58.7
Tertiary	179	35.7
Not stated	11	2.2
TOTAL	501	100.0

TABLE A6: HOUSEHOLD INCOME

EDUCATION LEVEL	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY (%)
$8,000	12	2.4
$8,001-18,000	83	16.6
$18,001-35,000	216	43.1
$35,001-75,000	97	19.4
$75,000	9	1.8
Not stated	84	16.8
TOTAL	501	100.0

The income groups identified in Table A6 were classified in the following manner:

Incomes were grouped into 19 categories as listed below:

Groups 00-04 were considered LOW INCOME,
05-08 MIDDLE INCOME,
09-12 MIDDLE INCOME,
13-16 UPPER MIDDLE INCOME
17-19 HIGH INCOMER earners.

When aggregating household incomes, the mid points of the class intervals were utilised.

GROUP	IDENTIFICATION	MID-POINTS OF CLASSES
00	None	-
01	Less than 2,000	2,000
02	2,001-4,000	3,000
03	4,001-6,000	5,000
04	6,001-8,000	7,000
05	8,001-10,000	9,000
06	10,001-12,000	11,000
07	12,001-15,000	13,500
08	15,001-18,000	16,500
09	18,001-22,000	20,000
10	22,001-26,000	24,000
11	26,001-30,000	28,000
12	30,001-35,000	32,500
13	35,001-45,000	40,000
14	45,001-55,000	50,000
15	55,001-65,000	60,000
16	65,001-75,000	70,000
17	75,001-85,000	80,000
19	More than 95,000	-
20	Not stated	-

TABLE A7: RELIGIOUS GROUPS

RELIGION	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY (%)
Catholic	86	17.2
Other Christian	216	43.1
Non-Christian	4	0.8
Greek Orthodox	24	4.8
No religion	169	33.7
Other	2	0.4
TOTAL	501	100.0

TABLE A7: CLARIFICATION DETAILS OF RELIGIOUS COMPOSITION

Group		Identification
(i)	Catholic	Catholic denomination
(ii)	Other Christian	All Christian denominations, other than Catholic
(iii)	Non-Christian	Hebrew, Muslim, Buddhist, Hindu
(iv)	Greek Orthodox	Greek Orthodox, Greek Orthodox + reformed Churches (married couples)
(v)	No religion	Those unwilling to state a specific religion or those without a religion
(vi)	Other	Mixed categories that could not be classified into any of the other groups

TABLE A8: CLARIFICATION DETAILS OF ETHNIC COMPOSITION

The survey yielded over 50 different types of ethnic households. Therefore, for ease of computation and clarity, the following re-grouping was resorted to.

In the case of mixed marriages where it was possible to establish a distinct influence of one individual on the rest of the households' consumption habits, his or her ethnic origin was recorded for that particular household. This was in keeping with the aims of the survey. Where such identification was not possible, the household was assigned to group 10, mixed household.

Group		Identification
(i)	Oceania	Mainly white Australian and New Zealander household
(ii)	Aboriginal and Islander	All other Australian classified as 'aboriginal' and various islander groups
(iii)	Adriatic	Mainly Greek, but included a few Iranian, Yugoslavian, Albanian and Latvian households
(iv)	West European	All West European countries, excluding British
(v)	East European	Polish, Czechoslovakian, Hungarian, Rumanian, Bulgarian and Prussian households
(vi)	British	Mainly English and Irish households
(vii)	Asian	All countries identified with the Asian Continent. Some of the dominant groups being: Chinese, Filipino, Indian, Indonesian, Japanese, Malay, Pakistani, Sri Lankan, Thai, Timorese, Vietnamese, Asian Mixed
(vii)	American	Mainly Latin American and North American (US) households
(viii)	Not stated	Unidentified households
(x)	Mixed households	See paragraph 2 above

TABLE A8: ETHNIC ORIGIN

ETHNIC GROUP	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY (%)
Oceania	261	52.0
Aboriginal and Islander	5	1.0
Adriatic	32	6.4
West European	43	8.6
East European	5	1.0
British	120	24.0
Asian	27	5.4
American	3	0.6
Mixed household	2	0.4
Not stated	3	0.6
TOTAL	501	100.0

APPENDIX II

(A) SOCIO-ECONOMIC CHARACTERISTICS

(A1 TO A8)

TABLE A1: DWELLING TYPE

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Greek Orthodox	24	4.8
No religion	43	8.6
Other	2	0.4
Not stated	126	25.1
TOTAL	501	100.0

TABLE A8: ETHNIC ORIGIN

ETHNIC ORIGIN	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY (%)
Australian	266	53.0
Adriatic	32	6.4
European	48	9.6
British	120	24.0
Asian	27	5.4
Other	8	1.6
TOTAL	501	100.0

(B) FORM OF SEAFOOD CONSUMPTION

(B1 TO B6)

TABLE B1: CONSUMPTION OF ANY FORM OF SEAFOOD BY INCOME: PERCENTAGE OCCASIONS

INCOME GROUP ($)	CONSUMPTION OF ANY FORM	
	YES	NO
$8,000	91.7	8.3
$8,001-18,000	94.7	6.0
$18,000-35,000	96.7	3.3
$35,000-75,000	95.9	4.1
$75,000	95.6	4.4

TABLE B2: FORM OF SEAFOOD CONSUMPTION BY INCOME: PERCENTAGE OCCASIONS

INCOME GROUP ($)	FORM OF SEAFOOD				
	FRESH SEAFOOD	FROZEN PRE-PACKAGED	SMOKED KIPPERED CURED & DRIED	CANNED	EATING OUT
$8,000	100.0	9.1	9.1	45.5	63.6
$8,001-18,000	87.2	46.2	21.8	88.5	85.9
$18,001-35,000	89.5	46.4	25.4	80.9	85.6
$35,000-75,000	93.5	34.4	23.7	82.8	89.2
$75,000	89.8	21.6	14.8	68.2	79.5

TABLE B3: FORM OF SEAFOOD CONSUMPTION BY NUMBER EMPLOYED IN HOUSEHOLD: PERCENTAGE OCCASIONS

INCOME GROUP ($)	FORM OF SEAFOOD: FRESH SEAFOOD	FROZEN PRE-PACKAGED	SMOKED KIPPERED CURED & DRIED	CANNED	EATING OUT
None	87.5	12.5	12.5	37.5	75.0
One	89.6	41.8	23.6	83.0	85.2
2-4	90.2	38.9	21.5	79.6	84.7
5-7	100.0	0.0	33.3	83.3	100.0
7	100.0	0.0	0.0	0.0	100.0

TABLE B4: FORM OF SEAFOOD CONSUMPTION BY HOUSEHOLD COMPOSITION: PERCENTAGE OCCASIONS

HOUSEHOLD COMPOSITION	FORM OF SEAFOOD: FRESH SEAFOOD	FROZEN PRE-PACKAGED	SMOKED KIPPERED CURED & DRIED	CANNED	EATING OUT
Single adults	80.0	30.0	18.0	66.0	92.0
Adult groups	87.5	35.8	18.3	73.3	81.7
Adults + 1 or 2 children	90.8	39.1	28.3	81.0	83.7
Adults + 2 children	95.6	51.1	14.4	87.8	92.2
Mixed groups	94.4	25.0	27.8	88.9	72.2

TABLE B5: FORM OF SEAFOOD CONSUMPTION BY ETHNIC ORIGIN: PERCENTAGE OCCASIONS

ETHNIC ORIGIN	FORM OF SEAFOOD				
	FRESH SEAFOOD	FROZEN PRE-PACKAGED	SMOKED KIPPERED CURED & DRIED	CANNED	EATING OUT
Australian	86.8	34.0	18.4	69.6	81.6
Adriatic	96.8	22.6	9.7	93.5	80.6
European	97.9	46.8	21.3	83.0	93.6
British	90.6	52.1	29.1	92.3	94.0
Asian	92.6	22.2	33.3	88.9	63.0
Other	100.0	50.0	50.0	87.5	87.5

TABLE B6: FORM OF SEAFOOD CONSUMPTION BY RELIGION: PERCENTAGE OCCASIONS

ETHNIC ORIGIN	FORM OF SEAFOOD				
	FRESH SEAFOOD	FROZEN PRE-PACKAGED	SMOKED KIPPERED CURED & DRIED	CANNED	EATING OUT
Catholic	89.3	41.7	21.4	75.0	85.7
Other Christian	93.4	45.3	23.6	85.8	87.7
Non-Christian	100.0	25.0	25.0	100.0	50.0
Greek Orthodox	100.0	21.7	8.7	95.7	82.6
No Religion	88.1	50.0	35.7	92.9	90.5
Other	100.0	0.0	0.0	0.0	0.0
Not stated	83.2	23.0	17.7	61.9	78.8

(C) MONTHLY CONSUMPTION

(C1 TO C50)

TABLE C1: MONTHLY CONSUMPTION OF FRESH FISH BY HOUSEHOLD NUMBER: PERCENTAGE OCCASIONS

HOUSEHOLD NUMBER	MONTHLY FREQUENCY								
	1	1-2	3-4	5-6	7-10	11-14	15-20	21-25	30
One persons	11.1	40.7	40.7	3.7	3.7	0.0	0.0	0.0	0.0
2-3 persons	15.7	35.2	32.7	6.3	5.0	4.4	0.6	0.0	0.0
4-5 persons	12.8	37.4	29.2	9.7	7.2	2.6	0.5	0.0	0.5
6-7 persons	14.3	39.3	25.0	10.7	7.1	0.0	0.0	3.6	0.0
7 persons	20.0	60.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0

TABLE C2: MONTHLY CONSUMPTION OF FROZEN PRE-PACKAGED FISH BY HOUSEHOLD NUMBER: PERCENTAGE OCCASIONS

HOUSEHOLD NUMBER	MONTHLY FREQUENCY					
	1	1-2	3-4	5-6	7-10	11-14
One person	33.3	55.6	11.1	0.0	0.0	0.0
2-3 persons	31.1	57.4	9.8	1.6	0.0	0.0
4-5 persons	23.7	50.5	21.6	4.1	0.0	0.0
6-7 persons	44.4	22.2	11.1	0.0	11.1	11.1
7 persons	100.0	0.0	0.0	0.0	0.0	0.0

TABLE C3: MONTHLY CONSUMPTION OF SMOKED FISH BY HOUSEHOLD NUMBER: PERCENTAGE OCCASIONS

HOUSEHOLD NUMBER	MONTHLY FREQUENCY				
	1	1-2	3-4	5-6	15-20
One person	71.4	28.6	0.0	0.0	0.0
2-3 persons	51.2	46.3	2.4	0.0	0.0
4-5 persons	30.6	57.1	8.2	2.0	2.0
6-7 persons	66.7	33.3	0.0	0.0	0.0
7 persons	50.0	50.0	0.0	0.0	0.0

TABLE C4: MONTHLY CONSUMPTION OF CANNED FISH BY HOUSEHOLD NUMBER: PERCENTAGE OCCASIONS

HOUSEHOLD NUMBER	MONTHLY FREQUENCY						
	1	1-2	3-4	5-6	7-10	11-14	15-20
One person	27.3	36.4	18.2	9.1	0.0	9.1	0.0
2-3 persons	19.0	55.3	19.0	2.9	2.2	0.7	0.7
4-5 persons	16.4	47.5	25.1	3.3	4.4	2.2	1.1
6-7 persons	32.0	32.0	28.0	0.0	4.0	4.0	0.0
7 persons	20.0	60.0	20.0	0.0	0.0	0.0	0.0

TABLE C5: MONTHLY CONSUMPTION OF FRESH SHELLFISH BY HOUSEHOLD NUMBER: PERCENTAGE OCCASIONS

HOUSEHOLD NUMBER	MONTHLY FREQUENCY							
	1	1-2	3-4	5-6	7-10	11-14	15-20	21-25
One person	31.6	36.8	26.3	5.3	0.0	0.0	0.0	0.0
2-3 persons	29.5	48.5	15.2	3.8	0.8	1.5	0.0	0.0
4-5 persons	37.1	50.9	8.8	2.5	0.0	0.6	0.0	0.0
6-7 persons	46.2	34.6	15.4	0.0	0.0	0.0	3.8	0.0
7 persons	20.0	40.0	20.0	0.0	20.0	0.0	0.0	0.0

TABLE C6: MONTHLY CONSUMPTION OF FROZEN PRE-PACKAGED SHELLFISH BY HOUSEHOLD NUMBER: PERCENTAGE OCCASIONS

HOUSEHOLD NUMBER	MONTHLY FREQUENCY			
	1	1-2	3-4	5-6
One person	25.0	25.0	25.0	25.0
2-3 persons	50.0	44.4	5.6	0.0
4-5 persons	70.8	25.0	0.0	4.2
6-7 persons	66.7	33.3	0.0	0.0
7 persons	100.0	0.0	0.0	0.0

TABLE C7: MONTHLY CONSUMPTION OF SMOKED SHELLFISH BY HOUSEHOLD NUMBER: PERCENTAGE OCCASIONS

HOUSEHOLD NUMBER	MONTHLY FREQUENCY	
	1	1-2
One person	100.0	0.0
2-3 persons	20.0	80.0
4-5 persons	60.0	49.0
6-7 persons	100.0	0.0

TABLE C8: MONTHLY CONSUMPTION OF CANNED SHELLFISH BY HOUSEHOLD NUMBER: PERCENTAGE OCCASIONS

HOUSEHOLD NUMBER	MONTHLY FREQUENCY					
	1	1-2	3-4	5-6	7-10	11-14
One person	37.5	37.5	12.5	12.5	0.0	0.0
2-3 persons	48.6	35.7	10.0	1.4	1.4	2.9
4-5 persons	50.6	31.5	11.2	3.4	1.1	2.2
6-7 persons	50.0	40.0	0.0	0.0	10.0	0.0
7 persons	100.0	0.0	0.0	0.0	0.0	0.0

TABLE C9: MONTHLY CONSUMPTION OF POULTRY BY HOUSEHOLD NUMBER: PERCENTAGE OCCASIONS

HOUSEHOLD NUMBER	MONTHLY FREQUENCY						
	1	1-2	3-4	5-6	7-10	11-14	15-20
One person	0.0	36.0	36.0	8.0	12.0	4.0	4.0
2-3 persons	3.0	23.1	45.6	4.1	18.3	3.0	3.0
4-5 persons	0.5	19.6	45.6	7.8	17.2	6.9	2.5
6-7 persons	0.0	16.7	46.7	10.0	16.7	6.7	3.3
7 persons	0.0	0.0	75.0	0.0	0.0	0.0	25.0

TABLE C10: MONTHLY CONSUMPTION OF MEAT BY HOUSEHOLD NUMBER: PERCENTAGE OCCASIONS

HOUSEHOLD NUMBER	MONTHLY FREQUENCY									
	1	1-2	3-4	5-6	7-10	11-14	15-20	21-25	26-30	30
One person	0.0	3.7	14.8	0.0	14.8	11.1	37.0	11.1	3.7	3.7
2-3 persons	1.2	1.2	1.2	1.2	8.7	11.6	51.7	12.8	8.7	1.7
4-5 persons	0.5	0.5	1.0	0.0	3.4	11.2	47.8	15.6	12.2	7.8
6-7 persons	0.0	0.0	3.3	0.0	6.7	6.7	46.7	20.0	16.7	0.0
7 persons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE C11: MONTHLY CONSUMPTION OF FRESH FISH BY HOUSEHOLD COMPOSITION: PERCENTAGE OCCASIONS

HOUSEHOLD COMPOSITION	MONTHLY FREQUENCY								
	1	1-2	3-4	5-6	7-10	11-14	15-20	21-25	30
Single adults	12.5	35.0	40.0	5.0	2.5	5.0	0.0	0.0	0.0
Adult groups	13.9	37.6	28.7	6.9	5.9	5.9	1.0	0.0	0.0
Adults + 1 or 2 children	13.2	34.0	34.6	8.2	7.5	1.3	0.6	0.0	0.6
Adults + 2 children	15.0	45.0	25.0	8.8	3.8	2.5	0.0	0.0	0.0
Mixed groups	17.6	35.3	20.6	11.8	11.8	0.0	0.0	2.9	0.0

TABLE C12: MONTHLY CONSUMPTION OF FROZEN PRE-PACKAGED FISH BY HOUSEHOLD COMPOSITION: PERCENTAGE OCCASIONS

HOUSEHOLD NUMBER	MONTHLY FREQUENCY					
	1	1-2	3-4	5-6	7-10	11-14
Single adults	23.1	53.8	23.1	0.0	0.0	0.0
Adult groups	28.2	66.7	5.1	0.0	0.0	0.0
Adults + 1 or 2 children	27.9	48.5	19.1	4.4	0.0	0.0
Adults + 2 children	21.7	52.2	19.6	4.3	2.2	0.0
Mixed groups	63.6	9.1	18.2	0.0	0.0	9.1

TABLE C13: MONTHLY CONSUMPTION OF SMOKED FISH BY HOUSEHOLD COMPOSITION: PERCENTAGE OCCASIONS

HOUSEHOLD NUMBER	MONTHLY FREQUENCY				
	1	1-2	3-4	5-6	15-20
Single adults	62.5	37.5	0.0	0.0	0.0
Adult groups	52.4	42.9	4.8	0.0	0.0
Adults + 1 or 2 children	38.0	54.0	6.0	0.0	0.0
Adults + 2 children	53.8	46.2	0.0	0.0	0.0
Mixed groups	20.0	60.0	10.0	10.0	0.0

TABLE C14: MONTHLY CONSUMPTION OF CANNED FISH BY HOUSEHOLD COMPOSITION: PERCENTAGE OCCASIONS

HOUSEHOLD NUMBER	MONTHLY FREQUENCY						
	1	1-2	3-4	5-6	7-10	11-14	15-20
Single adults	25.8	38.7	16.1	9.7	3.2	6.5	0.0
Adult groups	22.4	47.1	25.9	2.4	1.2	0.0	1.2
Adults + 1 or 2 children	17.7	52.4	19.7	3.4	3.4	2.0	1.4
Adults + 2 children	18.4	44.7	26.3	1.3	5.3	3.9	0.0
Mixed groups	12.1	57.6	24.2	3.0	3.0	0.0	0.0

TABLE C15: MONTHLY CONSUMPTION OF FRESH SHELLFISH BY HOUSEHOLD COMPOSITION: PERCENTAGE OCCASIONS

HOUSEHOLD COMPOSITION	MONTHLY FREQUENCY							
	1	1-2	3-4	5-6	7-10	11-14	15-20	21-25
Single adult	31.0	44.8	17.2	6.9	0.0	0.0	0.0	0.0
Adult groups	23.2	50.0	20.7	3.7	1.2	1.2	0.0	0.0
Adults + 1 or 2 children	32.6	52.3	9.8	3.0	0.0	1.5	0.0	0.8
Adults + 2 children	50.7	40.6	5.8	1.4	0.0	0.0	1.4	0.0
Mixed groups	37.9	41.4	17.2	0.0	3.4	0.0	0.0	0.0

TABLE C16: MONTHLY CONSUMPTION OF FROZEN PRE-PACKAGED SHELLFISH BY HOUSEHOLD COMPOSITION: PERCENTAGE OCCASIONS

HOUSEHOLD COMPOSITION	MONTHLY FREQUENCY			
	1	1-2	3-4	5-6
Single adults	20.0	40.0	20.0	20.0
Adult groups	46.2	46.2	7.7	0.0
Adults + 1 or 2 children	68.8	25.0	0.0	6.3
Adults + 2 children	73.3	26.7	0.0	0.0
Mixed groups	100.0	0.0	0.0	0.0

TABLE C17: MONTHLY CONSUMPTION OF SMOKED SHELLFISH BY HOUSEHOLD COMPOSITION: PERCENTAGE OCCASIONS

HOUSEHOLD COMPOSITION	MONTHLY FREQUENCY	
	1	1-2
Single adult	66.7	33.3
Adult groups	0.0	100.0
Adults + 1 or 2 children	100.0	0.0
Adults + 2 children	100.0	0.0
Mixed groups	50.0	50.0

TABLE C18: MONTHLY CONSUMPTION OF CANNED SHELLFISH BY HOUSEHOLD COMPOSITION: PERCENTAGE OCCASIONS

HOUSEHOLD COMPOSITION	MONTHLY FREQUENCY					
	1	1-2	3-4	5-6	7-10	11-14
Single adults	36.8	36.8	15.8	10.5	0.0	0.0
Adult groups	46.8	31.9	17.0	0.0	2.1	2.1
Adults + 1 or 2 children	52.1	34.2	6.8	2.7	1.4	2.7
Adults + 2 children	55.6	30.6	5.6	5.6	2.8	0.0
Mixed groups	36.4	45.5	9.1	0.0	0.0	9.1

TABLE C19: MONTHLY CONSUMPTION OF POULTRY BY HOUSEHOLD COMPOSITION: PERCENTAGE OCCASIONS

HOUSEHOLD COMPOSITION	MONTHLY FREQUENCY						
	1	1-2	3-4	5-6	7-10	11-14	15-20
Single adults	2.6	26.3	36.8	5.3	18.4	5.3	5.3
Adult groups	2.9	21.2	49.0	3.8	18.3	2.9	1.9
Adults + 1 or 2 children	1.2	23.7	42.6	8.3	15.4	5.9	3.0
Adults + 2 children	0.0	18.4	47.1	5.7	18.4	6.9	3.4
Mixed groups	0.0	14.7	52.9	8.8	17.6	2.9	2.9

TABLE C20: MONTHLY CONSUMPTION OF MEAT BY HOUSEHOLD COMPOSITION: PERCENTAGE OCCASIONS

HOUSEHOLD COMPOSITION	MONTHLY FREQUENCY									
	1	1-2	3-4	5-6	7-10	11-14	15-20	21-25	26-30	30
Single adults	0.0	4.7	9.3	4.7	16.3	7.0	44.2	7.0	4.7	2.3
Adult groups	2.0	0.0	2.0	0.0	5.9	17.6	49.0	11.8	8.8	2.9
Adults + 1 or 2 children	0.0	1.2	1.8	0.0	7.0	9.4	51.5	16.4	9.4	3.5
Adults + 2 children	1.1	0.0	0.0	0.0	3.4	10.2	40.9	17.0	19.3	8.0
Mixed groups	0.0	0.0	0.0	0.0	5.9	5.9	58.8	14.7	5.9	8.8

TABLE C21: MONTHLY CONSUMPTION OF FRESH FISH BY COUNTRY OF ETHNIC ORIGIN: PERCENTAGE OCCASIONS

COUNTRY OF ETHNIC ORIGIN	MONTHLY FREQUENCY								
	1	1-2	3-4	5-6	7-10	11-14	15-20	21-25	30
Australian	13.4	33.0	33.0	9.6	6.7	2.9	0.5	0.5	0.5
Adriatic	13.3	53.3	16.7	0.0	10.0	6.7	0.0	0.0	0.0
European	14.0	44.2	27.9	9.3	4.7	0.0	0.0	0.0	0.0
British	18.8	40.6	27.7	5.9	4.0	3.0	0.0	0.0	0.0
Asian	4.3	30.4	39.1	8.7	13.0	0.0	4.3	0.0	0.0
Other	0.0	25.0	50.0	12.5	0.0	12.5	0.0	0.0	0.0

TABLE C22: MONTHLY CONSUMPTION OF FROZEN PRE-PACKAGED FISH BY COUNTRY OF ETHNIC ORIGIN: PERCENTAGE OCCASIONS

COUNTRY OF ETHNIC ORIGIN	MONTHLY FREQUENCY					
	1	1-2	3-4	5-6	7-10	11-14
Australian	31.0	53.6	10.7	2.4	1.2	1.2
Adriatic	33.3	44.4	22.2	0.0	0.0	0.0
European	33.3	57.1	4.8	4.8	0.0	0.0
British	21.4	50.0	25.0	3.6	0.0	0.0
Asian	25.0	25.0	50.0	0.0	0.0	0.0
Other	33.3	33.3	33.3	0.0	0.0	0.0

TABLE C23: MONTHLY CONSUMPTION OF SMOKED FISH BY COUNTRY OF ETHNIC ORIGIN: PERCENTAGE OCCASIONS

COUNTRY OF ETHNIC ORIGIN	MONTHLY FREQUENCY				
	1	1-2	3-4	5-6	15-20
Australian	41.3	54.3	4.3	0.0	0.0
Adriatic	66.7	33.3	0.0	0.0	0.0
European	44.4	33.3	22.2	0.0	0.0
British	45.5	51.5	0.0	0.0	3.0
Asian	28.6	42.9	14.3	14.3	0.0
Other	50.0	50.0	0.0	0.0	0.0

TABLE C24: MONTHLY CONSUMPTION OF CANNED FISH BY COUNTRY OF ETHNIC ORIGIN: PERCENTAGE OCCASIONS

COUNTRY OF ETHNIC ORIGIN	MONTHLY FREQUENCY						
	1	1-2	3-4	5-6	7-10	11-14	15-20
Australian	23.3	48.8	22.7	1.7	2.3	0.6	0.6
Adriatic	20.7	55.2	6.9	3.4	6.9	6.9	6.0
European	23.1	48.7	28.2	0.0	0.0	0.0	0.0
British	12.6	45.6	25.2	6.8	3.9	3.9	1.9
Asian	4.5	54.5	27.3	0.0	9.1	4.5	0.0
Other	28.6	57.1	0.0	14.3	0.0	0.0	0.0

TABLE C25: MONTHLY CONSUMPTION OF FRESH SHELLFISH BY COUNTRY OF ETHNIC ORIGIN: PERCENTAGE OCCASIONS

COUNTRY OF ETHNIC ORIGIN	MONTHLY FREQUENCY							
	1	1-2	3-4	5-6	7-10	11-14	15-20	21-25
Australian	31.1	48.4	15.5	5.0	0.0	0.0	0.0	0.0
Adriatic	34.6	38.5	7.7	7.7	3.8	0.0	3.8	3.8
European	32.5	52.5	12.5	0.0	2.5	0.0	0.0	0.0
British	42.9	47.6	8.3	0.0	0.0	1.2	0.0	0.0
Asian	28.0	48.0	20.0	0.0	0.0	4.0	0.0	0.0
Other	40.0	40.0	0.0	0.0	0.0	20.0	0.0	0.0

TABLE C26: MONTHLY CONSUMPTION OF FROZEN PRE-PACKAGED SHELLFISH BY COUNTRY OF ETHNIC ORIGIN: PERCENTAGE OCCASIONS

COUNTRY OF ETHNIC ORIGIN	MONTHLY FREQUENCY			
	1	1-2	3-4	5-6
Australian	60.0	35.0	0.0	5.0
Adriatic	100.0	0.0	0.0	0.0
European	100.0	0.0	0.0	0.0
British	52.4	38.1	9.5	0.0
Asian	0.0	0.0	0.0	100.0
Other	50.0	50.0	0.0	0.0

TABLE C27: MONTHLY CONSUMPTION OF SMOKED SHELLFISH BY COUNTRY OF ETHNIC ORIGIN: PERCENTAGE OCCASIONS

COUNTRY OF ETHNIC ORIGIN	MONTHLY FREQUENCY	
	1	1-2
Australian	0.0	100.0
European	50.0	50.0
British	71.4	28.6
Asian	100.0	0.0

TABLE C28: MONTHLY CONSUMPTION OF SMOKED SHELLFISH BY COUNTRY OF ETHNIC ORIGIN: PERCENTAGE OCCASIONS

COUNTRY OF ETHNIC ORIGIN	MONTHLY FREQUENCY					
	1	1-2	3-4	5-6	7-10	11-14
Australian	52.5	28.8	12.5	3.8	1.3	1.3
Adriatic	45.5	36.4	18.2	0.0	0.0	0.0
European	55.0	35.0	5.0	5.0	0.0	0.0
British	46.8	38.7	6.5	3.2	0.0	4.8
Asian	33.3	22.2	22.2	0.0	22.2	0.0
Other	25.0	75.0	0.0	0.0	0.0	0.0

TABLE C29: MONTHLY CONSUMPTION OF POULTRY BY COUNTRY OF ETHNIC ORIGIN: PERCENTAGE OCCASIONS

COUNTRY OF ETHNIC ORIGIN	MONTHLY FREQUENCY						
	1	1-2	3-4	5-6	7-10	11-14	15-20
Australian	1.4	22.0	50.0	4.7	15.9	4.2	1.4
Adriatic	3.6	17.9	42.9	3.6	17.9	3.6	10.7
European	4.4	33.3	42.2	4.4	13.3	2.2	0.0
British	0.0	18.2	42.7	11.8	17.3	4.5	5.5
Asian	0.0	14.8	22.2	7.4	29.6	22.2	3.7
Other	0.0	25.0	50.0	0.0	25.0	0.0	0.0

TABLE C30: MONTHLY CONSUMPTION OF MEAT BY COUNTRY OF ETHNIC ORIGIN: PERCENTAGE OCCASIONS

COUNTRY OF ETHNIC ORIGIN	MONTHLY FREQUENCY									
	1	1-2	3-4	5-6	7-10	11-14	15-20	21-25	26-30	30
Australian	0.9	1.8	3.2	0.5	7.3	10.5	55.7	12.8	4.6	2.7
Adriatic	0.0	0.0	3.6	0.0	3.6	21.4	50.0	14.3	7.1	0.0
European	0.0	0.0	0.0	0.0	0.0	10.9	1.3	17.4	19.6	10.9
British	0.0	0.0	0.0	0.9	8.1	9.0	58.7	18.0	19.8	5.4
Asian	3.8	0.0	3.8	0.0	7.7	11.5	46.2	7.7	7.7	11.5
Other	0.0	0.0	0.0	0.0	25.0	12.5	37.5	12.5	12.5	0.0

TABLE C31: MONTHLY CONSUMPTION OF FRESH FISH BY RELIGION: PERCENTAGE OCCASIONS

	MONTHLY FREQUENCY								
RELIGION	1	1-2	3-4	5-6	7-10	11-14	15-20	21-25	30
Catholic	11.0	34.2	30.1	15.1	5.5	2.7	1.4	0.0	0.0
Other Christian	16.5	38.3	28.7	7.4	5.9	2.7	0.0	0.0	0.5
Non-Christian	25.0	25.0	0.0	25.0	25.0	0.0	0.0	0.0	0.0
Greek Orthodox	17.4	52.2	21.7	0.0	8.7	0.0	0.0	0.0	0.0
No religion	11.1	38.9	36.1	0.0	8.3	2.8	0.0	2.8	0.0
Other	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Not stated	11.2	33.7	37.1	7.9	4.5	4.5	1.1	0.0	0.0

TABLE C32: MONTHLY CONSUMPTION OF FROZEN PRE-PACKAGED FISH BY RELIGION: PERCENTAGE OCCASIONS

	MONTHLY FREQUENCY					
RELIGION	1	1-2	3-4	5-6	7-10	11-14
Catholic	29.4	50.0	17.6	0.0	2.9	0.0
Other Christian	26.7	53.3	17.8	2.2	0.0	0.0
Non-Christian	0.0	100.0	0.0	0.0	0.0	0.0
Greek Orthodox	16.7	50.0	33.3	0.0	0.0	0.0
No religion	42.1	26.3	15.8	10.5	0.0	5.3
Not stated	23.1	65.4	7.7	3.8	0.0	0.0

TABLE C33: MONTHLY CONSUMPTION OF SMOKED FISH BY RELIGION: PERCENTAGE OCCASIONS

	MONTHLY FREQUENCY				
RELIGION	1	1-2	3-4	5-6	15-20
Catholic	52.9	35.3	5.9	0.0	5.9
Other Christian	32.7	59.2	6.1	2.0	0.0
Greek Orthodox	50.0	50.0	0.0	0.0	0.0
No religion	71.4	28.6	0.0	0.0	0.0
Not stated	40.0	55.0	5.0	0.0	0.0

TABLE C34: MONTHLY CONSUMPTION OF CANNED FISH BY RELIGION: PERCENTAGE OCCASIONS

	MONTHLY FREQUENCY						
RELIGION	1	1-2	3-4	5-6	7-10	11-14	15-20
Catholic	19.4	54.8	17.7	4.8	0.0	1.6	1.6
Other Christian	19.1	43.8	27.0	3.4	4.5	1.7	0.6
Non-Christian	0.0	66.7	33.3	0.0	0.0	0.0	0.0
Greek Orthodox	22.7	50.0	4.5	4.5	9.1	9.1	0.0
No religion	13.5	56.8	18.9	5.4	0.0	5.4	0.0
Not stated	21.7	50.7	23.2	0.0	2.9	0.0	1.4

TABLE C35: MONTHLY CONSUMPTION OF FRESH SHELLFISH BY RELIGION: PERCENTAGE OCCASIONS

	MONTHLY FREQUENCY							
RELIGION	1	1-2	3-4	5-6	7-10	11-14	15-20	21-25
Catholic	29.5	41.0	23.0	3.3	1.6	1.6	0.0	0.0
Other Christian	38.3	48.7	10.4	1.3	0.0	1.3	0.0	0.0
Non-Christian	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0
Greek Orthodox	30.0	45.0	5.0	5.0	5.0	0.0	5.0	5.0
No religion	41.9	45.2	6.5	6.5	0.0	0.0	0.0	0.0
Other	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Not stated	30.0	51.4	14.3	4.3	0.0	0.0	0.0	0.0

TABLE C36: MONTHLY CONSUMPTION OF FROZEN PRE-PACKAGED SHELLFISH BY RELIGION: PERCENTAGE OCCASIONS

	MONTHLY FREQUENCY			
RELIGION	1	1-2	3-4	5-6
Catholic	62.5	37.5	0.0	0.0
Other Christian	67.9	25.0	7.1	0.0
Greek Orthodox	100.0	0.0	0.0	0.0
No religion	25.0	75.0	0.0	0.0
Not stated	28.6	42.9	0.0	28.6

TABLE C37: MONTHLY CONSUMPTION OF SMOKED SHELLFISH BY RELIGION: PERCENTAGE OCCASIONS

	MONTHLY FREQUENCY	
RELIGION	1	1-2
Catholic	66.7	33.3
Other Christian	57.1	42.9
Non-Christian	100.0	0.0
No religion	0.0	100.0
Not stated	0.0	100.0

TABLE C38: MONTHLY CONSUMPTION OF CANNED SHELLFISH BY RELIGION: PERCENTAGE OCCASIONS

	MONTHLY FREQUENCY					
RELIGION	1	1-2	3-4	5-6	7-10	11-14
Catholic	71.4	25.0	3.6	0.0	0.0	0.0
Other Christian	43.9	36.7	9.2	4.1	2.0	4.1
Non-Christian	100.0	0.0	0.0	0.0	0.0	0.0
Greek Orthodox	57.1	14.3	28.6	0.0	0.0	0.0
No religion	47.6	33.3	9.5	9.5	0.0	0.0
Not stated	41.9	38.7	16.1	0.0	3.2	0.0

TABLE C39: MONTHLY CONSUMPTION OF POULTRY BY RELIGION: PERCENTAGE OCCASIONS

	MONTHLY FREQUENCY						
RELIGION	1	1-2	3-4	5-6	7-10	11-14	15-20
Catholic	2.5	31.6	39.2	7.6	15.2	2.5	1.3
Other Christian	0.5	22.0	44.5	7.5	17.0	6.0	2.5
Non-Christian	0.0	0.0	50.0	25.0	0.0	25.0	0.0
Greek Orthodox	4.5	13.6	40.9	4.5	22.7	4.5	9.1
No religion	0.0	25.6	48.7	0.0	20.5	5.1	0.0
Other	0.0	0.0	100.0	0.0	0.0	0.0	0.0
Not stated	2.3	12.6	51.7	5.7	17.2	4.6	5.7

TABLE C40: MONTHLY CONSUMPTION OF MEAT BY RELIGION: PERCENTAGE OCCASIONS

	MONTHLY FREQUENCY									
RELIGION	1	1-2	3-4	5-6	7-10	11-14	15-20	21-25	26-30	30
Catholic	0.0	0.0	2.5	0.0	7.5	8.8	48.8	13.8	12.5	6.3
Other Christian	0.0	0.5	1.5	1.0	4.4	11.3	47.8	14.8	12.8	5.9
Non-Christian	25.0	0.0	0.0	0.0	0.0	0.0	75.0	0.0	0.0	0.0
Greek Orthodox	0.0	0.0	4.5	0.0	4.5	18.2	54.5	9.1	9.1	0.0
No religion	0.0	0.0	5.3	0.0	10.5	5.3	36.8	28.9	10.5	2.6
Other	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0
Not stated	2.2	3.3	1.1	0.0	11.1	13.3	52.2	10.0	4.4	2.2

TABLE C41: MONTHLY CONSUMPTION OF FRESH FISH BY INCOME: PERCENTAGE OCCASIONS

	MONTHLY FREQUENCY								
INCOME GROUP ($)	1	1-2	3-4	5-6	7-10	11-14	15-20	21-25	30
$8,000	20.0	20.0	60.0	0.0	0.0	0.0	0.0	0.0	0.0
$8,001-18,000	15.2	43.9	25.8	7.6	4.5	3.0	0.0	0.0	0.0
$18,001-35,000	16.0	38.1	32.6	7.2	3.3	1.7	0.6	0.0	0.0
$35,001-75,000	12.2	35.4	25.6	9.8	9.8	4.9	1.2	1.2	0.6
$75,000	9.3	33.3	32.0	9.3	12.0	4.0	0.0	0.0	0.0

TABLE C42: MONTHLY CONSUMPTION OF FROZEN PRE-PACKAGED FISH BY INCOME: PERCENTAGE OCCASIONS

	MONTHLY FREQUENCY					
INCOME GROUP ($)	1	1-2	3-4	5-6	7-10	11-14
$8,000	100.0	0.0	0.0	0.0	0.0	0.0
$8,001-18,000	27.3	60.6	12.1	0.0	0.0	0.0
$18,001-35,000	31.9	50.5	15.4	2.2	0.0	0.0
$35,001-75,000	22.6	48.4	16.1	6.5	3.2	3.2
$75,000	15.0	50.0	30.0	5.0	0.0	0.0

TABLE C43: MONTHLY CONSUMPTION OF SMOKED FISH BY INCOME: PERCENTAGE OCCASIONS

INCOME GROUP ($)	MONTHLY FREQUENCY				
	1	1-2	3-4	5-6	15-20
$8,000	0.0	100.0	0.0	0.0	0.0
$8,001-18,000	43.8	50.0	6.3	0.0	0.0
$18,001-35,000	42.0	50.0	6.0	0.0	2.0
$35,001-75,000	39.1	52.2	4.3	4.3	0.0
$75,000	58.3	41.7	0.0	0.0	0.0

TABLE C44: MONTHLY CONSUMPTION OF CANNED FISH BY INCOME: PERCENTAGE OCCASIONS

INCOME GROUP ($)	MONTHLY FREQUENCY						
	1	1-2	3-4	5-6	7-10	11-14	15-20
$8,000	40.0	0.0	60.0	0.0	0.0	0.0	0.0
$8,001-18,000	19.4	50.7	22.4	3.0	0.0	4.5	0.0
$18,001-35,000	17.7	56.1	18.9	4.3	1.2	1.2	0.6
$35,001-75,000	16.0	40.0	26.7	2.7	10.7	2.7	1.3
$75,000	25.0	43.3	23.3	1.7	3.3	1.7	1.7

TABLE C45: MONTHLY CONSUMPTION OF FRESH SHELLFISH BY INCOME: PERCENTAGE OCCASIONS

INCOME GROUP ($)	MONTHLY FREQUENCY							
	1	1-2	3-4	5-6	7-10	11-14	15-20	21-25
$8,000	71.4	14.3	14.3	0.0	0.0	0.0	0.0	0.0
$8,001-18,000	50.0	28.8	13.5	3.8	0.0	1.9	0.0	1.9
$18,001-35,000	28.8	56.8	9.4	2.9	0.7	0.7	0.7	0.0
$35,001-75,000	32.9	50.0	14.5	1.3	0.0	1.3	0.0	0.0
$75,000	31.3	44.8	17.9	4.5	1.5	0.0	0.0	0.0

TABLE C46: MONTHLY CONSUMPTION OF FROZEN PRE-PACKAGED SHELLFISH BY INCOME: PERCENTAGE OCCASIONS

INCOME GROUP ($)	MONTHLY FREQUENCY			
	1	1-2	3-4	5-6
$8,001-18,000	75.0	8.3	8.3	8.3
$18,001-35,000	51.9	44.4	3.7	0.0
$35,001-75,000	60.0	40.0	0.0	0.0
$75,000	66.7	16.7	0.0	16.7

TABLE C47: MONTHLY CONSUMPTION OF SMOKED SHELLFISH BY INCOME: PERCENTAGE OCCASIONS

INCOME GROUP ($)	MONTHLY FREQUENCY	
	1	1-2
$8,001-18,000	100.0	0.0
$18,001-35,000	42.9	57.1
$35,001-75,000	33.3	66.7
$75,000	100.0	0.0

TABLE C48: MONTHLY CONSUMPTION OF CANNED SHELLFISH BY INCOME: PERCENTAGE OCCASIONS

INCOME GROUP ($)	MONTHLY FREQUENCY					
	1	1-2	3-4	5-6	7-10	11-14
$8,001-18,000	50.0	35.7	10.7	3.6	0.0	0.0
$18,001-35,000	46.7	33.7	10.9	3.3	1.1	4.3
$35,001-75,000	43.6	41.0	7.7	2.6	5.1	0.0
$75,000	65.4	23.1	7.7	3.8	0.0	0.0

TABLE C49: MONTHLY CONSUMPTION OF POULTRY BY INCOME: PERCENTAGE OCCASIONS

INCOME GROUP ($)	MONTHLY FREQUENCY						
	1	1-2	3-4	5-6	7-10	11-14	15-20
$8,000	0.0	28.6	14.3	0.0	28.6	28.6	0.0
$8,001-18,000	1.4	29.2	38.9	6.9	16.7	4.2	2.8
$18,001-35,000	1.6	21.0	50.0	7.5	12.9	4.8	2.2
$35,001-75,000	0.0	23.0	40.2	5.7	20.7	5.7	4.6
$75,000	2.5	13.9	49.4	5.1	21.5	3.8	3.8

TABLE C50: MONTHLY CONSUMPTION OF MEAT BY INCOME: PERCENTAGE OCCASIONS

INCOME GROUP ($)	MONTHLY FREQUENCY									
	1	1-2	3-4	5-6	7-10	11-14	15-20	21-25	26-30	30
$8,000	0.0	0.0	0.0	0.0	12.5	0.0	62.5	25.0	0.0	0.0
$8,001-18,000	0.0	0.0	4.2	0.0	11.1	6.9	40.3	16.7	16.7	4.2
$18,001-35,000	0.0	1.6	1.6	0.5	4.2	11.1	48.4	15.8	12.1	4.7
$35,001-75,000	1.2	0.0	1.2	1.2	9.3	19.8	41.9	11.6	7.0	7.0
$75,000	2.5	1.2	2.5	0.0	6.2	6.2	63.0	11.1	6.2	1.2

(D) PER HEAD CONSUMPTION

(D1 TO D13)

TABLE D1: PER HEAD CONSUMPTION OF FRESH FISH BY HOUSEHOLD NUMBER: PERCENTAGE OCCASIONS

HOUSEHOLD NUMBER	CONSUMPTION FREQUENCY (GRAMS)						
	1-100	101-200	201-300	301-400	401-500	501-750	750
One person	0.0	15.4	42.3	7.7	19.2	3.8	11.5
2-3 persons	2.8	24.3	21.5	21.5	18.8	8.3	2.8
4-5 persons	7.0	29.6	30.6	16.7	11.3	4.3	0.5
6-7 persons	0.0	36.0	24.0	20.0	16.0	4.0	0.0
7 persons	0.0	20.0	0.0	40.0	0.0	40.0	0.0

TABLE D2: PER HEAD CONSUMPTION OF FRESH SHELLFISH BY HOUSEHOLD NUMBER: PERCENTAGE OCCASIONS

HOUSEHOLD NUMBER	CONSUMPTION FREQUENCY (GRAMS)						
	1-100	101-200	201-300	301-400	401-500	501-750	750
One person	6.7	13.3	20.0	0.0	26.7	6.7	26.7
2-3 persons	3.5	23.9	16.8	24.8	22.1	6.2	2.7
4-5 persons	18.1	40.6	18.1	7.2	10.9	3.6	1.4
6-7 persons	9.1	50.0	13.6	22.7	0.0	0.0	4.5
7 persons	0.0	50.0	25.0	0.0	0.0	25.0	0.0

TABLE D3: PER HEAD CONSUMPTION OF FRESH FISH BY HOUSEHOLD COMPOSITION: PERCENTAGE OCCASIONS

HOUSEHOLD COMPOSITION	CONSUMPTION FREQUENCY (GRAMS)						
	1-100	101-200	201-300	301-400	401-500	501-750	750
Single adults	5.7	11.4	48.6	8.6	14.3	11.4	0.0
Adult groups	3.4	22.7	26.1	17.0	21.6	8.0	1.1
Adults + 1 or 2 children	4.0	28.9	29.5	18.1	14.8	4.7	0.0
Adults + 2 children	6.6	39.5	21.1	22.4	5.3	5.3	0.0
Mixed groups	3.2	22.6	16.1	29.0	22.6	6.5	0.0

TABLE D4: PER HEAD CONSUMPTION OF FRESH SHELLFISH BY HOUSEHOLD COMPOSITION: PERCENTAGE OCCASIONS

HOUSEHOLD COMPOSITION	CONSUMPTION FREQUENCY (GRAMS)						
	1-100	101-200	201-300	301-400	401-500	501-750	750
Single adults	14.3	14.3	28.6	0.0	28.6	9.5	4.8
Adults group	2.9	21.7	14.5	20.3	29.0	11.6	0.0
Adults + 1 or 2 children	7.2	38.7	24.3	13.5	13.5	2.7	0.0
Adults + 2 children	30.6	50.0	4.8	11.3	0.0	1.6	1.6
Mixed groups	0.0	28.6	23.8	33.3	14.3	0.0	0.0

TABLE D5: PER HEAD CONSUMPTION OF FRESH FISH BY COUNTRY OF ETHNIC ORIGIN: PERCENTAGE OCCASIONS

COUNTRY OF ETHNIC ORIGIN	CONSUMPTION FREQUENCY (GRAMS)						
	1-100	101-200	201-300	301-400	401-500	501-750	750
Australian	4.3	27.7	28.7	16.5	14.4	6.9	1.6
Adriatic	7.1	7.1	21.4	35.7	17.9	10.7	0.0
European	5.0	27.5	32.5	15.0	15.0	2.5	2.5
British	5.0	27.7	24.8	17.8	15.8	5.9	3.0
Asian	0.0	50.0	13.6	22.7	9.1	0.0	4.5
Other	0.0	0.0	57.1	14.3	14.3	14.3	0.0

TABLE D6: PER HEAD CONSUMPTION OF FRESH FISH BY INCOME: PERCENTAGE OCCASIONS

INCOME GROUP ($)	CONSUMPTION FREQUENCY (GRAMS)						
	1-100	101-200	201-300	301-400	401-500	501-750	750
$8,000	22.2	33.3	22.2	0.0	22.2	0.0	0.0
$8,001-18,000	1.6	32.8	31.1	23.0	6.6	4.9	0.0
$18,001-35,000	4.2	29.7	26.7	15.8	15.2	7.9	0.6
$35,001-75,000	5.4	27.0	29.7	20.3	13.5	4.1	0.0
$75,000	4.3	17.1	25.7	22.9	22.9	7.1	0.0

TABLE D7: PER HEAD CONSUMPTION OF FRESH SHELLFISH BY INCOME: PERCENTAGE OCCASIONS

INCOME GROUP ($)	CONSUMPTION FREQUENCY (GRAMS)						
	1-100	101-200	201-300	301-400	401-500	501-750	750
$8,000	20.0	40.0	0.0	0.0	20.0	20.0	0.0
$8,001-18,000	13.6	36.4	15.9	20.5	9.1	4.5	0.0
$18,001-35,000	8.0	38.4	16.8	11.2	20.0	4.8	0.8
$35,001-75,000	14.3	26.8	25.0	21.4	7.1	5.4	0.0
$75,000	13.0	31.5	16.7	14.8	18.5	3.7	1.9

TABLE D9: PER HEAD CONSUMPTION OF FROZEN PRE-PACKAGED SHELLFISH BY INCOME: PERCENTAGE OCCASIONS

INCOME GROUP ($)	CONSUMPTION FREQUENCY (GRAMS)				
	1-100	101-200	201-300	301-400	401-500
$8,001-18,000	50.0	50.0	0.0	0.0	0.0
$18,001-35,000	27.4	27.3	27.3	13.6	4.5
$35,001-75,000	0.0	60.0	20.0	20.0	0.0
$75,000	33.3	0.0	50.0	16.7	0.0

TABLE D9: PER HEAD CONSUMPTION OF SMOKED FISH BY INCOME: PERCENTAGE OCCASIONS

INCOME GROUP ($)	CONSUMPTION FREQUENCY (GRAMS)				
	1-100	101-200	201-300	301-400	401-500
$8,000	0.0	100.0	0.0	0.0	0.0
$8,001-18,000	43.8	37.5	12.5	6.3	0.0
$18,001-35,000	39.6	33.3	22.9	2.1	2.1
$35,001-75,000	45.5	27.3	22.7	4.5	0.0
$75,000	18.2	36.4	45.5	0.0	0.0

TABLE D10: PER HEAD CONSUMPTION OF SMOKED SHELLFISH BY INCOME: PERCENTAGE OCCASIONS

INCOME GROUP ($)	CONSUMPTION FREQUENCY (GRAMS)	
	1-100	101-200
$8,001-18,000	100.0	0.0
$18,001-35,000	60.0	40.0
$35,001-75,000	100.0	0.0
$75,000	100.0	0.0

TABLE D11: PER HEAD CONSUMPTION OF CANNED FISH BY INCOME: PERCENTAGE OCCASIONS

INCOME GROUP ($)	CONSUMPTION FREQUENCY (GRAMS)			
	1-100	101-200	201-300	301-500
$8,000	80.0	20.0	0.0	0.0
$8,001-18,000	66.7	28.8	3.0	1.5
$18,001-35,000	66.3	27.6	6.1	0.0
$35,001-75,000	68.9	25.7	5.4	0.0
$75,000	63.0	29.6	7.4	0.0

TABLE D12: PER HEAD CONSUMPTION OF CANNED SHELLFISH BY INCOME: PERCENTAGE OCCASIONS

INCOME GROUP ($)	CONSUMPTION FREQUENCY (GRAMS)	
	1-100	101-200
$8,001-18,000	75.0	25.0
$18,001-35,000	95.4	4.6
$35,001-75,000	100.0	0.0
$75,000	90.5	9.5

(E) SEAFOOD SPECIES

(E1 TO E6)

TABLE E2: FRESH SEAFOOD SPECIES CONSUMED AT HOME BY INCOME: PERCENTAGE OCCASIONS

SEAFOOD SPECIES	INCOME GROUP ($) $8,000	$8,001-$18,000	$18,001-$35,000	$35,001-$75,000	$75,000	SEAFOOD SPECIES	INCOME GROUP ($) $8,000	$8,001-$18,000	$18,001-$35,000	$35,001-$75,000	$75,000
Barracuda	0.0	1.5	1.6	1.1	1.3	Trevally	0.0	10.4	7.4	14.8	11.4
Barramundi	54.5*	68.7	71.8	68.2	74.7	Tuna	0.0	4.5	3.2	3.4	0.0
Bream	18.2	16.4	14.4	12.5	16.5	Turrum	0.0	0.0	2.1	5.7	1.3
Butterfish	0.0	1.5	0.0	2.3	2.5	Whiting	0.0	13.4	7.4	12.5	7.6
Catfish (Moonfish)	9.1	7.5	5.9	4.5	5.1	Reef Fish	9.1	1.5	3.2	6.8	6.3
Cod	0.0	11.9	14.4	11.4	10.1	Mangrove Jack	18.2	3.0	1.6	4.5	2.5
Coral Trout	9.1	11.9	12.2	15.9	6.3	Anchovies (Ikanbilis)	0.0	0.0	0.5	0.0	0.0
Estuarine Rock Cod	9.1	10.4	4.3	9.1	3.8	White Bait	0.0	0.0	0.5	1.1	0.0
Flathead	0.0	4.5	3.7	3.4	3.8	Angel Fish (Butterfish)	0.0	0.0	0.5	0.0	0.0
Flounder	0.0	3.0	5.3	4.5	3.8	Red Salmon	0.0	0.0	0.0	1.1	0.0
Grunter	18.2	4.5	1.6	1.1	3.8	Ock Ock	0.0	1.5	0.5	1.1	0.0
Halibut	0.0	0.0	0.5	0.0	0.0	Saki	0.0	1.5	0.0	0.0	0.0
Javelin	0.0	0.0	0.5	1.1	0.0	Tommy Ruff	0.0	1.5	0.0	0.0	0.0
Jewfish (Dhufish)	0.0	16.4	16.5	20.5	15.2	Spanish Flag	9.1	0.0	0.0	0.0	1.3
Mullet	0.0	13.4	5.3	9.1	6.3	Fish in sauce	0.0	0.0	0.0	0.0	1.3
Parrotfish	18.2	10.4	14.4	13.6	7.6	Bugs	18.2	22.4	30.3	28.4	34.2
Queenfish (Skinny)	18.2	17.9	16.0	15.9	10.1	Crabs	36.4	34.3	22.3	37.5	32.9
Red Emperor	27.3	14.9	20.7	34.1	22.8	Lobster (Grayfish)	9.1	7.5	14.4	11.4	20.3
Red Finned Emperor	18.2	3.0	5.3	8.0	3.8	Octopus	9.1	10.4	4.8	2.3	2.5
Threadfin Salmon	27.3	22.4	22.3	14.8	17.7	Oysters	9.1	17.9	16.0	12.5	21.5
Sea Perch	9.1	4.5	8.0	14.8	11.4	Prawns	54.5	62.7	66.0	77.3	72.2
Shark (Flake)	9.1	3.0	5.3	8.0	3.8	Scallops	9.1	26.9	23.4	31.8	29.1
Snapper	36.4	35.8	37.8	44.3	39.2	Squid (Calamari)	0.0	19.4	13.3	23.9	17.7
Spanish Mackerel	18.2	11.9	17.0	21.6	12.7	Cuttlefish	9.1	0.0	0.5	3.4	0.0
Stingray	0.0	0.0	0.5	4.5	1.3	Mussels	0.0	3.0	1.6	2.3	0.0
Stripey	0.0	7.5	7.4	11.4	0.0	Cockles	0.0	1.5	0.0	0.0	0.0
Sweetlip	18.2	9.0	8.5	12.5	5.1	Yabbies	0.0	1.5	0.0	0.0	0.0

* Fresh seafood species consumed by each income group-that is, 54.5% of those households having an income of less than $8,000 consumed barramundi.

TABLE E3: FROZEN PRE-PACKAGED SEAFOOD SPECIES CONSUMED AT HOME BY INCOME: PERCENTAGE OCCASIONS

SEAFOOD SPECIES	INCOME GROUP ($) 8,000	8,001-18,000	18,001-35,000	35,001-75,000	75,000
Cod	0.0	10.8	8.2	12.9	5.3
Fishburgers	0.0	8.1	4.1	6.5	0.0
Fishcakes	50.0	13.5	14.4	3.2	5.3
Fishfingers	100.0	75.7	80.4	77.4	94.7
Fish Sticks (Sea Legs)	0.0	8.1	5.2	6.5	5.3
Flounder	0.0	10.8	4.1	6.5	10.5
Plaice	0.0	2.7	2.1	3.2	0.0
Prawns	0.0	16.2	8.2	9.7	10.5
Prawn Cutlets	0.0	10.8	13.4	16.1	21.1
Rainbow Trout	0.0	2.7	2.1	0.0	0.0
Scallops	0.0	24.3	16.5	9.7	10.5
Sea Bream Fillets	0.0	2.7	0.0	6.5	0.0
Seafood Crepes	0.0	0.0	1.0	0.0	0.0
Sea Shantys	0.0	0.0	4.1	0.0	0.0
Whiting	0.0	16.2	5.2	19.4	21.1
Haddock	0.0	0.0	0.0	3.2	0.0
Mussels	0.0	0.0	1.0	0.0	0.0
Shrimps	0.0	2.7	0.0	0.0	0.0
Snapper	0.0	0.0	2.1	3.2	0.0
Sea Perch	0.0	0.0	2.1	3.2	0.0
Seafood Cocktail	0.0	2.7	0.0	0.0	0.0
Fish in Parsley Sauce	0.0	0.0	0.0	3.2	0.0
Herring	0.0	2.7	0.0	0.0	0.0
Sweet and Sour	0.0	0.0	1.0	0.0	0.0

TABLE E4: SMOKED SEAFOOD SPECIES CONSUMED AT HOME BY INCOME: PERCENTAGE OCCASIONS

SEAFOOD SPECIES	INCOME GROUP ($) 8,000	8,001-18,000	18,001-35,000	35,001-75,000	75,,000
Kippers	0.0	0.0	1.9	0.0	7.7
Sprats	0.0	0.0	0.0	4.5	0.0
Smoked Mackerel	0.0	6.3	7.4	9.1	0.0
Smoked Cod	0.0	56.3	66.7	59.1	53.8
Smoked Bottled Herring	0.0	31.3	7.4	13.6	7.7
Mussels	0.0	0.0	7.4	13.6	7.7
Smoked Haddock	0.0	6.3	14.8	13.6	30.8
Oysters	0.0	6.3	3.7	0.0	0.0
Rollmops	0.0	12.5	7.4	4.5	7.7
Cockles	0.0	6.3	1.9	0.0	0.0
Dried Anchovies - Ikanbilis	0.0	6.3	0.0	4.5	0.0
Smoked Eels	100.0	0.0	1.9	0.0	0.0
Smoked Salmon	0.0	6.3	7.4	13.6	7.7
Scallops	0.0	0.0	1.9	9.1	0.0
Crab Meat	100.0	6.3	1.9	0.0	7.7

TABLE E5: CANNED SEAFOOD CONSUMED AT HOME BY INCOME: PERCENTAGE OCCASIONS

SEAFOOD SPECIES	INCOME GROUP ($) 8,000	8,001-18,000	18,001-35,000	35,001-75,000	75,000
Fish in Sauce	0.0	0.0	0.6	0.0	0.0
Anchovy	40.0	17.4	8.8	14.3	15.3
Baby Clam	0.0	2.9	3.5	2.6	0.0
Crabs	0.0	7.2	8.8	15.6	1.7
Herring	0.0	17.4	8.2	11.7	15.3
Kippers	0.0	4.3	6.5	10.4	3.4
Mackerel	20.0	7.2	5.3	5.2	5.1
Mussels	0.0	15.9	13.5	11.7	6.8
Oysters	0.0	39.1	47.6	39.0	45.8
Pilchards	0.0	1.4	4.7	3.9	0.0
Prawns	0.0	5.8	7.6	15.6	3.4
Salmon	20.0	50.7	61.8	63.6	69.5
Sardine	60.0	63.8	51.8	62.3	49.2
Shrimps	0.0	1.4	2.4	3.9	0.0
Snoek	0.0	0.0	1.2	0.0	0.0
Tuna	40.0	59.4	71.8	75.3	78.0
Squid	0.0	0.0	0.6	0.0	0.0
Sprats	0.0	1.4	0.0	0.0	0.0
Cod Roe	0.0	0.0	0.6	0.0	0.0
Octopus	0.0	1.4	0.6	0.0	0.0

TABLE F1: DAY OF THE WEEK SEAFOOD SERVED AT HOME BY RELIGION: PERCENTAGE OCCASIONS

RELIGION	DAY OF THE WEEK		
	MONDAY-THURSDAY	FRIDAY	SATURSDAY & SUNDAY
Catholic	8.4	45.8	41.0
Other Christian	9.6	12.4	57.4
Non-Christian	25.0	25.0	25.0
Greek Orthodox	0.0	4.3	17.4
No Religion	9.5	16.7	40.5
Not Stated	4.8	5.8	23.1
Other	0.0	0.0	100.0

TABLE F2: COOKING METHOD OF SEAFOOD BY ETHNIC ORIGIN: PERCENTAGE OCCASIONS

ETHNIC ORIGIN	COOKING METHOD						
	FRY OR CRUMB	BOIL OR STEAM	BAKE	STRAIGHT	CURRY	GRILL OR BBQ	OTHER
Australian	270.2	79.5	54.7	58.4	32.9	80.7	6.2
Adriatic	314.3	114.3	50.0	78.6	25.0	117.9	32.1
European	281.0	92.9	47.6	90.5	35.7	92.9	9.5
British	285.6	87.6	53.6	128.9	25.8	118.6	13.4
Asian	315.4	80.8	46.2	53.8	53.8	57.7	30.8
Other	242.9	14.3	85.7	100.0	14.3	100.0	42.9

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