

CONSUMPTION PATTERNS AND ATTITUDES
TOWARDS SEAFOOD IN NORTH AND
CENTRAL QUEENSLAND

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ABSTRACT

Purchasing patterns and attitudes to fish and shellfish consumption are analysed with reference to specific inland and coastal towns of Queensland. Spatial variations in different forms of seafood consumption, sources of purchase, availability of the product, consumption situation, restraints to consumption, frequency and species of consumption and cooking methods are examined. Possible socio-economic factors explaining these consumption trends are also discussed. Through the analysis of consumer behaviour an attempt is made at a better comprehension of macro-marketing problems in order to make more efficient use of resources and effectively solve marketing problems. Finally, suggestions for the future are made on the basis of population growth and marketing strategies to be adopted.

PART I

Introduction

1.1 General Introduction:

This report is based on a survey of fish and shellfish consumption in Queensland, north of the tropic of Capricorn. The study was undertaken by the author since it was felt that there was a complete lack of knowledge in Australia, regarding the existing attitudes and patterns of fish and shellfish consumption. During 1976-1977 a similar survey was conducted by the Department of Primary Industry, Canberra¹, in the capital cities of Australia, excluding Darwin. For purposes of cross reference results on Brisbane from the latter survey, have been referred to in this report.

The report has been presented in four parts to facilitate selective reading of the relevant sections. Part I deals with background information to the survey, Part II with sampling procedures and survey coverage, Part III with the analysis of survey results and Part IV future trends.

In consumption and marketing literature throughout the world, there is some ambiguity over the term 'seafood'. Whilst some authors refer to the different kinds of shellfish, others refer to the entire group of fish and shellfish. In this paper, the term '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. The term 'seafood' is used to include both fish and shellfish species.

¹ Fish and Seafood Consumption in Australia: a Consumer Survey 1976-1977, PA Consulting Services, Melbourne and Fisheries Division Department of Primary Industry, AGPS, Canberra, 1978

1.2 Objectives:

The specific objectives of this research were to

- (i) illustrate spatial variations in seafood consumption patterns in select coastal and inland towns of north and central Queensland, and to identify a distance decay function in consumption within the region;
- (ii) examine the differences in seafood purchasing habits;
- (iii) identify varying attitudes towards seafood consumption;
- (iv) investigate the hypothesis that relatively low seafood consumption is a result of limited purchasing opportunities and the lack of market research;
- (v) examine the influence of specific socio-economic variables on seafood consumption.

1.3 Relevance of Survey:

In looking at consumption patterns and attitudes towards seafood we are in effect examining consumer behaviour in this field. That is 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. Consumer behaviour involves the study not only of what people consume but where, how often and under what conditions these goods and services are consumed.

In the decision process, purchasing is only one aspect. It is cohesively linked to consumption of the product (seafood), both by the buyer and by the other members of the group for which the buyer serves as a purchasing agent. Therefore, the *household* was selected as the interviewing unit in order to include the influences of the total family (or other group) on the behaviour of the purchaser.

The analysis of consumer behaviour enables a better comprehension of macro-marketing problems, or how a society should

meet the needs of its people. It leads to the more efficient use of fisheries resources and of marketing resources, and in the more effective solutions to marketing management problems.

The *raison d'être* for this survey was to improve predictions concerning what seafood products consumers will buy and under what conditions they will buy them. Such predictions enable fishermen, retailers, wholesalers, economists, biologists and governmental administrators to plan the resource and structural arrangements of a society to increasingly satisfy the demands of the consumer.

1.4 Geographical Background:

A brief note about the physical and human background of the region is relevant to the study, and is examined here.

The geographical location of Australia, surrounded in all directions by water and its extensive latitudinal spread from temperate to tropical waters should theoretically facilitate a high rate of fish and shellfish consumption. Yet owing to a number of reasons, the per capita consumption in Australia as a whole has been relatively low when compared with other countries. Queensland with its coastline spreading from semi-tropical to tropical waters has access to a wide range of fish and shellfish species. The Gulf of Carpentaria in particular, is much endowed in high value species of fish and shellfish - ie mainly Barramundi and prawns.

Approximately a fourth of Queensland's fish production comes from the area north of Rockhampton (area researched - Fig 1) Queensland's fish production is weighted to a large extent by the catch in the southern ports of Brisbane, Wynnum, Scarborough and Mooloolaba. In the latter areas, large quantities of Mullet, Whiting, Bream and Tailor are popular, whilst in North Queensland Mackerel, Barramundi, Coral Trout and Sweetlip are of greater importance, in the catch composition.

When examining consumption patterns, trends in population growth and per capita consumption are of significance. Approximately a fourth of Queensland's population is located in the area north of Rockhampton. After Brisbane, Townsville is the second largest city in Queensland. In addition, some of the fastest growing areas such as the Mackay Division, the Far North Division and the Northern Division are located in North Queensland. Population and growth rates for the areas surveyed are given in Table 1. This aspect is of great relevance when projecting future demand for consumer products such as seafood.

It is paradoxical that Australia whilst having an abundance of easily accessible protein rich seafoods, has a lower demand for fish and shellfish than for other competing proteins such as meat and poultry. For example in 1976-77, the annual per capita consumption of total carcass meat was 92.3 kg, for poultry 15.8 kg (Australian Bureau of Statistics, 1979), and for the same period in the capital cities of Australia the seafood consumption rate was 10.1 kg. This comprised 7.8 kg of fish and 2.3 kg of shellfish (Fish and Seafood Consumption in Australia, 1978).

Among the Australian capital cities, Brisbane had the second highest rate of seafood consumption - 10.4 kg - after Sydney. Although Queenslanders appear to be consuming more seafood than the average Australian, research outside the capital city clearly illustrates that consumption rates vary widely within Queensland - Table 1. These variations are a result of geographical aspect, demographic, socio-economic and behavioural characteristics of the population.

TABLE 1: POPULATION¹ AND PER CAPITA CONSUMPTION² OF SELECT QUEENSLAND TOWNS

Urban Centres	Population (1971)	Population (1976)	Population Change 1971-1976 (%)	Annual per Capita Consumption (kg)
BRISBANE	700,671	696,740	-0.56	10.4
TOWNSVILLE	68,591	78,653	14.67	8.2
CAIRNS	32,747	39,305	20.03	8.6
ROCKHAMPTON	48,213	50,132	3.98	8.0
BOWEN	5,880	6,707	14.06	10.4
MT ISA	25,497	25,377	-0.47	8.0
CHARTERS TOWERS	7,518	7,914	5.27	5.5
HUGHENDEN	1,916	1,811	-5.48	4.7
MAREEBA	5,160	5,776	11.94	7.6

Source: ¹ Queensland Year Book, 1980

² DPI Survey, 1978 (Brisbane),
Author's surveys for all
other towns

PART II

Methodology

2.1 Survey Coverage:

The analysis of the survey was based on select coastal and inland towns of Queensland - namely, Townsville, Cairns, Rockhampton, Bowen, Mt Isa, Charters Towers, Hughenden and Mareeba. These urban centres provided a representative cross section of the economy of Queensland with populations varying between 80,000 and 2,000 accompanied by widely fluctuating growth rates - Table 1.

The survey covered a total of 1607 households which is approximately 3.5 percent of all households in the region surveyed. The proportion of households sampled in each town varied depending on the degree of variance in the original population. On the average sample proportions varied between 2.5% and 12.2% - Table 2. Compared with other consumer household surveys this was a representatively large sample.

TABLE 2 : SAMPLE SIZE OF TOWNS SURVEYED

Town	Sample Size (Households)	Proportion of all Households in Town (%)
TOWNSVILLE	531	2.5
CAIRNS	300	3.7
ROCKHAMPTON	345	2.8
BOWEN	50	3.3
MT ISA	182	2.8
CHARTERS TOWERS	100	5.3
HUGHENDEN	60	12.2
MAREEBA	39	3.0

The surveys were conducted over the period 1977 to 1980.

2.2 Sampling Procedure:

The survey was administered with the aid of a detailed questionnaire (Section 2.3). Sample design was based on a pilot survey carried out in Townsville in 1977. Further

pilot surveys were carried out in each of the towns researched for minor modifications of the original questionnaire and to establish sample size. The basic sampling technique, as discussed in this section remained unchanged throughout the survey.

Area or Quadrat sampling was adopted in this survey where the map of the urban area was used as the sampling frame, rather than a list or register of households. This method was resorted to owing to difficulties of obtaining comprehensive and up to date lists of dwellings in each of the towns surveyed. The area to be surveyed was divided into a number of smaller cells (1 cm x 1 cm), and selection of households based on a stratified random sample.

A random sample is where each member of the population has an equal chance of being selected into the sample. Stratification is a means of using knowledge of the population to increase the representativeness and precision of the sample and to permit comparisons between different groups or areas. The total variation in a population can be regarded as comprising two elements: variations between strata and variation within strata. Thus a distinct advantage of this method is the greatly reduced sampling errors.

The standard error of a proportion in a stratified random sample having a uniform sampling fraction is estimated by:

$$S.E.p = \sqrt{\frac{\sum n_i p_i (1 - p_i)}{n^2}}$$

where Σ = summation over all the strata

n_i = sample number in the i th stratum

p_i = proportion of sample in the i th stratum
possessing attribute

n = total sample size

In order to provide an estimate of the population proportion (Π), the proportion for each stratum was calculated and then combined into a weighted average. Since in this case sampling fractions were uniform, sample numbers were used to replace population numbers as weights. The formula is as follows:

$$\Pi = p = \frac{\sum n_i p_i}{n}$$

Whilst the above formulae were used to estimate attributes - eg those who preferred a particular form of seafood, the standard error of the sample mean (S.E. \bar{x}) was used to estimate variables - eg average frequency of seafood consumption. The formula used was as follows:

$$\text{S.E.}\bar{x} = \sqrt{\frac{\sum n_i \sigma_i^2}{n^2}}$$

where n_i = sample number in the i th stratum

$\sigma_i = s_i$ = standard deviation for the variable in question in the population in the i th stratum

Σ = summation over all the strata

n = total sample size

It must be remembered that statements based on sample results are always probability statements. However an adequately representative unbiased sample can predict fairly accurately the exact state of the population.

The stratification factor used was the 'neighbourhood', the boundaries of which were slightly modified to coincide with the cell boundaries of the sampling frame. The neighbourhood was selected as the stratification factor since in most instances it represented homogenous socio-economic characteristics. As will be noted in the survey, these characteristics were important underlying features in analysing patterns of consumption. The purpose of this stratification was such that an approximately equal number of interviews

(uniform sampling fraction) were taken from each area to provide a better neighbourhood representation than would occur using non-stratified sampling. A random selection of quadrats from each neighbourhood was made. Within the selected cell every third household was interviewed moving in a clockwise direction. Up to a maximum of two personal calls were made at each household. Interviewing was conducted by trained interviewers both during the week and at weekends between 9 am and 7 pm. It is possible that there could be a slight bias towards non-working households, owing to the elimination of a household after two consecutive calls and the fact that a larger percentage of the interviews were conducted during working hours.

2.3 Questionnaire Design:

The Questionnaire was designed to examine consumption patterns, purchasing behaviour, attitudes and general demographic, socio-economic characteristics. The variables and attributes examined (questioned) were as follows:

* Consumption patterns

consumers and non-consumers
frequency of consumption
species of seafood consumed
favourite fish or shellfish
method of seafood preparation

* Those engaged in fishing activity

frequency of fishing trips
subsistence or commercial fishing
average catch
percentage of catch sold/distributed
species caught
area of fishing
number of months/years fishing

- * Purchasing behaviour
form of seafood purchased
source of supply
availability of the product

- * Attitudes
reasons for not purchasing seafood
preferences for different forms of seafood
reasons for not increasing present consumption
preferences for eating seafood at a restaurant

- * Population Characteristics
number in household
household structure
occupation
income
religion
length of residence
original residence

A distinction was made between *consumers* and total *non-consumers* of seafood. In the case of the latter group only the population characteristics were listed. Among the consumers there were sub groups who did not consume particular forms of seafood.

The *frequency* of consumption per month was registered together with the average quantity consumed at each meal. This enabled the calculation of annual per capita consumption rates. It was not possible to record consumption frequencies separately for fish and shellfish owing to the low recall rate in the differentiation of the seafood type.

Species of seafood consumed varied somewhat between towns. It was noted here that some consumers found it difficult to recall specific species whilst others were not too sure of the species consumed. There was also the problem of the same species being identified by two different names in two localities.

Whilst availability of seafood was determined by finding out the species consumed, desirability of particular species was accounted for through the question on '*favourite*' fish or shellfish.

It was also the intention in the research to find out whether the consumer was aware of various *cooking methods* of seafood as this would indirectly influence consumption.

Since most fish and shellfish records dealt with commercial production, an attempt was made in the research to assess the contribution of non-commercial fishing. Therefore data were collected on those households engaged in *fishing activity*, commercial or otherwise.

Forms of seafood were categorised into four broad groups - *fresh, frozen, smoked* (including dried or cured), and *canned*.

Purchase *sources* of different forms of seafood were identified ranging from the supermarket, hotel/pub, fish shop, delicatessen, Fish Board, friends, relatives (including personal catch), fisherman, private supplier, neighbourhood store, mobile unit (fish van), fish market and other sources.

Availability of the product by form was questioned on the basis of whether the consumer was satisfied or unsatisfied. If they were unsure of their opinion they were noted as having 'no opinion'.

Attitudes to seafood consumption were found to be an important measure of present seafood intake levels. Various reasons for *non-purchase* of different forms of seafood were noted and grouped under - high price, poor availability, low quality, dislike and other reasons.

Preference for different forms of seafood, and reasons for *not increasing* present consumption of seafood were documented.

Here too, reasons given by the consumer were grouped into - high price, poor availability, low quality, on maximum consumption, prefer other forms and no special reason.

There were sub groups in the population indicating distinct preferences for eating seafood in a *restaurant* as against at home, or eating at take-away outlets or combinations of these. These preferences were identified in the survey.

In analysing some of these variables it must be noted that some questions yielded multiple response answers. Therefore, the totals in some of the Tables exceed 100 percent.

Household size and *household structure* gives an indication regarding the stage in the life cycle. Most consumers over time, pass through several stages in their lives known as the 'family life cycle'. These stages have been broadly grouped for the purposes of the survey, as:

- * single adult
- * adult couple
- * adult group
- * single adult with one child
- * single adult with two children
- * single adult with three or more children
- * adult couple with one child
- * adult couple with two children
- * adult couple with three or more children
- * adult group with children

The life cycle concept is useful because research has shown that family needs, income, assets and debts, and expenditure vary at different life cycle stages. Family influences affect individual personality characteristics, attitudes, evaluative criteria, and consumption patterns, and these in turn change as the individual proceeds through the family life cycle. Therefore it becomes one of the most powerful

ways of classifying and segmenting individuals and families and is of fundamental importance to marketers.

The family members (household) must satisfy their unique and joint consumption needs from a common and relatively fixed amount of financial resources. From this point of view, *income* and *occupation* of the households were recorded. The gross income of the household was recorded prior to tax deductions. Occupation was used as a surrogate measure for income which on a few occasions remained undisclosed. Where relevant, incomes of both husband and wife, or a group of adults were noted. The occupation categories adopted were the same as the occupation classification of the Australian Bureau of Statistics.

Five major *religious groups* were identified for the survey. The term 'Reformed Churches' was used to identify all members of the Uniting Churches, Protestants etc; 'Other Christians' included religious faiths such as Jehovah's Witnesses, Seventh Day Adventists, Mormons etc and 'Other Religions' included Buddhists, Hindus, Muslims and others.

Religious groups may provide important subcultures among those groups in which members conform closely to group norms. Seventh Day Adventists for example, limit their purchase of meat, some Catholics refrain from eating meat on Fridays, Buddhists may refrain from consuming any kind of fish, meat or poultry on full-moon days. As religious groups lose followers and as mobility causes followers to become spatially dispersed, the hold of the subculture declines as a constraint on behaviour - such is the case with migrant Buddhists or Brahmins in Australia - but basic values of the subculture may continue to influence some aspects of decision making. The knowledge of the existence of these subcultures and their influence upon consumption decisions is of great relevance when planning market strategies. It must be noted however, that the net effect of the declining influence of

religious institutions is to allow values of the new consumer of nineteen eighties to be established in more personal and presumably more diversified ways.

Geographic mobility was looked at in terms of - 'Last place of residence' and 'Period of residence in present town'. The last place of residence was analysed in terms of different Australian States and the more popular migrant countries. Research has shown that often purchasing and consumption habits are linked to the original environment. Hence the period of residence in a particular locality is an important determinant of purchasing and consumption habits.

Geographic mobility results in new market opportunities. People move to places where they did not live before and thus create new markets. With time, some of them abandon old purchase loyalties and perhaps old product preference. This sub-group seek consumption information from new sources. In these circumstances enterprising businessmen will recognise the new markets created by geographic mobility and create new retail outlets. They will use new media and new campaign themes to exploit the new market opportunities of suburbia and interurbia.

Geographic location also determines to a large extent access to the product. That is a coastal or inland location. Quite obviously owing to the natural location of seafood resources, coastal towns would be expected to have better access to supplies. The influence of these variables are discussed more specifically in Part III of this report.

PART III

Presentation of Results

3.1 Characteristics of the Population:

It is essential to know the background distribution of socio-economic characteristics of the population sampled in order to view consumption patterns and attitudes more meaningfully. Table 3 summarises the distribution of variables for all towns surveyed. Individual deviation from this are found in the Appendix in Tables I to VIII. These deviations support the representativeness of the samples since the survey included a good cross section of the total population.

As seen from Table 3, all occupational categories were fully represented in the survey. The representative coverage from all social classes is further highlighted in that 21.1 percent of Tradesmen, Production/Process Workers and Labourers (middle income group), 17.8 percent of Pensioners and Retired Persons (lower income group), and 12.1 percent of Professional, Technical and Related Workers (higher income group) were sampled. With reference to income distribution too, there was an appropriate concentration of households in the income categories of between \$6,001 to \$20,000.

With reference to occupational categories, a large proportion of the households in every town, had people employed as Tradesmen, Production/Process Workers and Labourers. Townsville had the largest percentage (18%) employed as Professional, Technical and Related Workers probably owing to its varied industrial and business enterprises, and the presence of academic institutions. Mt Isa, an exclusive mining town of recent growth, had a high concentration of Miners, Quarrymen and Related Workers (20%). At Charters Towers (16%) and Hughenden (18%) there were larger percentages than elsewhere employed as Workers in Transport and Communication.

These individual variations in the occupational categories were reflected in the income categories of each town. At

TABLE 3 SOCIO-ECONOMIC CHARACTERISTICS FOR ALL TOWNS: SUMMARY

<u>Occupation</u>	
Classification	%
Professional, Technical and Related Workers	12.1
Administrative, Executive and Managerial Workers	7.1
Clerical Workers	6.1
Sales Workers	8.0
Farmers, Fishermen, Hunters, Timbergetters and Related Workers	4.0
Miners, Quarrymen and Related Workers	2.7
Workers in Transport and Communication	7.5
Tradesmen, Production/Process Workers and Labourers	21.1
Service, Sport and Recreation Workers	3.2
Members of Armed Services	3.6
Pensioners and Retired Persons	17.8
Unemployed (includes Students)	3.3
Inadequately Described or Not Stated	3.5
TOTAL	100.0

<u>Household Number</u>	
Number	%
1	8.8
2	23.6
3	16.2
4	21.3
5	15.6
More than 5	14.5
TOTAL	100.0

<u>Household Structure</u>	
Structure	%
Single Adult	8.7
Adult Couple	19.5
Adult Group	5.7
Single Adult + 1 child	1.2
Single Adult + 2 children	1.9
Single Adult + 3 or more children	1.4
Adult Couple + 1 child	10.8
Adult Couple + 2 children	20.3
Adult Couple + 3 or more children	25.6
Adult Group + 1 or more children	4.9
TOTAL	100.0

<u>Income</u>	
Range	%
Less than \$2,000	4.2
\$2,000 - \$4,000	11.7
\$4,001 - \$6,000	7.6
\$6,001 - \$8,000	13.6
\$8,001 - \$10,000	19.6
\$10,001 - \$15,000	20.3
\$15,001 - \$20,000	14.7
More than \$20,000	8.3
TOTAL	100.0

Period of Residence in Each Town Surveyed

Years	%
0 - 10	43.0
11 - 10	15.5
21 - 30	15.1
31 - 50	9.0
41 - 50	8.8
More than 50	8.6
TOTAL	100.0

Last Place of Residence

Location	%
Coastal Queensland	50.6
Inland Queensland	27.1
New South Wales	8.0
Victoria	4.2
South Australia	2.2
Western Australia	1.7
Northern Territory	1.0
Tasmania	0.5
ACT	0.1
New Zealand	0.1
Nuigini	0.8
Europe	3.6
America	0.1
TOTAL	100.0

Religion

Religion	%
Catholic	31.6
Reformed Churches	51.7
Other Christians	4.8
Other Religions	1.0
No Religion	10.9
TOTAL	100.0

Mt Isa, the average household income frequencies were greater in the categories above \$10,000, reflecting the higher average income per household. In contrast, owing to the relatively larger percentage of pensioners sampled at Mareeba, Townsville and Rockhampton the percentage of those with incomes ranging from \$2,000 - 4,000 was much higher than elsewhere.

Of the households sampled 61.1 percent had a household size of between two and four persons. This pattern was consistent in all the towns surveyed. The predominant household structure included an adult couple together with two or more children (45.9%). Household structures having only an adult couple (19.5%) were also frequent. The only noticeable deviation here was at Mareeba where the group "Single Adult" had the highest individual frequency (21%). This was mainly because the sample in this town included a relatively large percentage of single pensioners or retired persons.

43 percent of the households had resided in their respective towns between 0 and 10 years. However, a little less than three-fourths (73.5%) of the households sampled had lived in their towns for anything up to 30 years. Once again, the residents of Mareeba had a higher modal frequency (42%) for the period 11 to 20 years owing to the older age of the respondents. At Mareeba, as much as two-thirds of the population had lived in that town anything between 11 to 30 years. The period of residence in a particular town is relevant to this survey, since consumption patterns are established in any town, over a period of time.

More than three-fourths (77.7%) of the households had lived in Queensland, either in the present town or elsewhere in Queensland. Of these half had lived in one of the coastal towns; Particularly when dealing with a commodity like seafood, it is assumed a coastal location is

of advantage to consumption owing to direct access to the product. Residence in inter-state and overseas countries was also taken into consideration since consumption habits in those places were found to influence current consumption patterns to a large extent. A little over a tenth of the households sampled were from New South Wales and Victoria. Of the overseas countries the largest influx (3.6%) was from the European countries.

The majority (51.7%) of households sampled belonged to the Reformed Churches. The next highest frequency (31.6%) was in the Catholic denomination. This trend was consistent in all towns surveyed except at Mareeba, where there was a slightly higher percentage frequency in the category of Catholics, than in the Reformed Churches.

In countries where there are a predominance of Buddhists (Sri Lanka), Hindus (India) or Muslims (Pakistan) there is a greater likelihood of religion being an important attribute influencing the consumption of seafood. Although such differences are not obvious in Australia, where the majority are 'Christians' this variable (religion), was selected to identify minor variations if any.

It will be seen in the section to follow that the above discussed distributions of socio-economic variables have in most instances an indirect influence on consumption styles and attitudes. More specific analysis in relation to the demographic, socio-economic features of the population are discussed in section 3.13.

3.2 Consumers and Non-Consumers:

Fig 1 illustrates the format of sections 3.2 to 3.12. Irrespective of the geographical location of the town (Fig I, Appendix) and hence access to fish supplies, the proportion of households consuming any form of fish or shellfish was significantly high - above 82 percent - Table

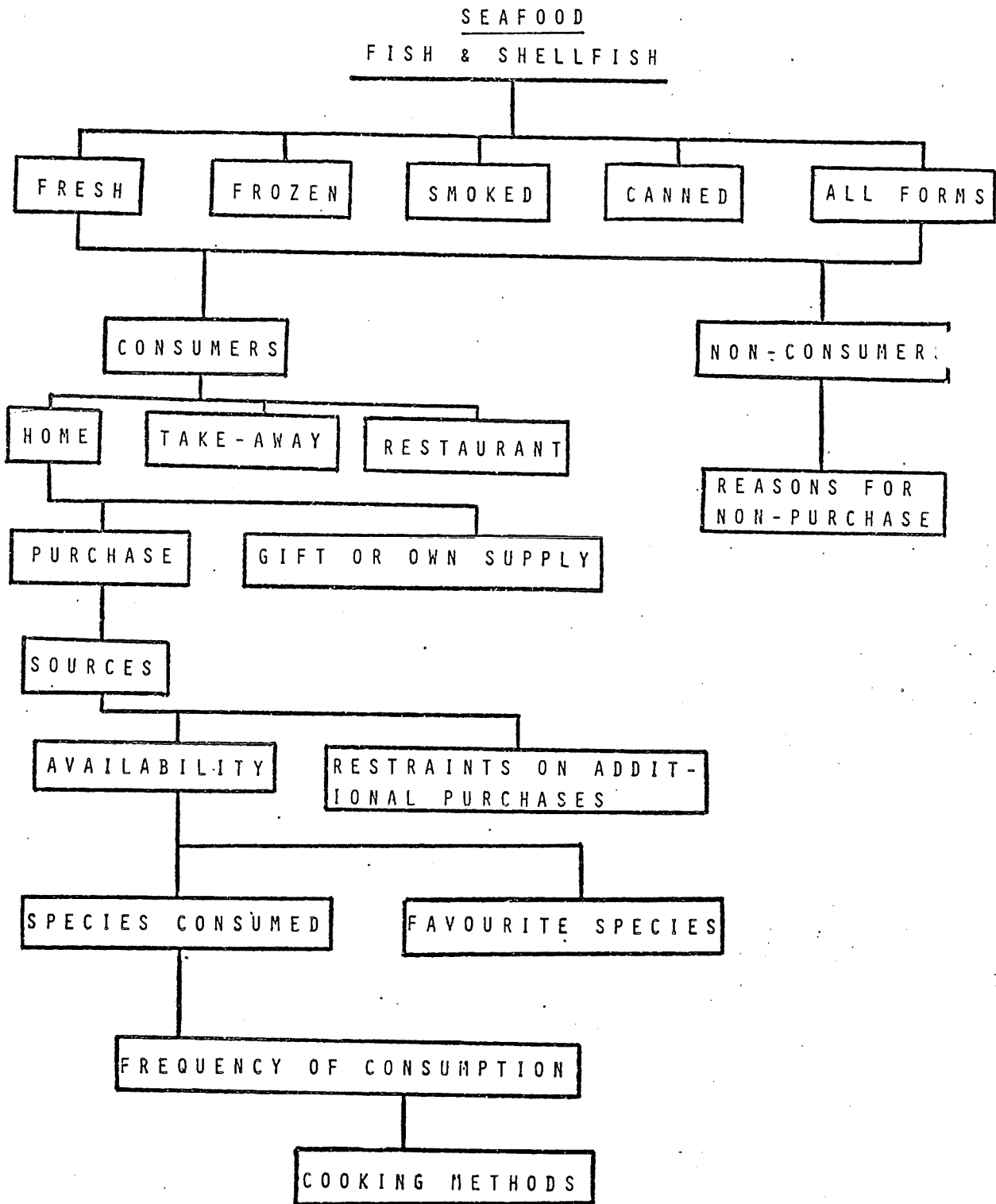


FIG 1: FLOW DIAGRAM OF DATA ANALYSIS

4. In a majority of the towns the percentage non-consumers of any form of seafood was only about 10 percent or less. Irrespective of actual quantities consumed, the high proportion of consumers is encouraging to future expansion and promotion of seafood marketing in these and similar areas.

The relatively lower percentage consumers at Charters Towers (86%) and Hughenden (82%) can be explained with reference to their inland coastal locations, pastoral economies and demographic structures. In contrast, Mt Isa which is also located in the interior of north-west Queensland has a much higher incidence of consumption (90%). It is a city of predominantly young people with an added advantage of direct access to the Gulf of Carpentaria, from which it obtains almost all its supplies of fresh fish and shellfish. Mareeba, located on the Atherton Tablelands surprisingly had a very high level of household consumption (100%). Possible reasons for this are discussed in the sections to follow.

3.3 Consumption form:

Overall consumption in the form of 'fresh' and 'canned' supplies were most popular, with 'frozen packaged' supplies next most popular - Table 4. 'Smoked' or 'cured' varieties of fish and shellfish were found popular among smaller ethnic groups, located at Cairns and Townsville. Brisbane too exhibited a similar trend in preferences for various forms of fish and shellfish (Fish and Seafood Consumption in Australia, 1978).

The very high rates of fresh seafood consumption at Townsville (97%) and Mareeba (92%) are noteworthy. At Cairns, Bowen, Charters Towers and Hughenden consumption of canned seafood was 2 to 7 percent higher than fresh seafood. Although there are individual variations among the different towns, the overall trend, in forms of consumption, is common to most of Queensland.

TABLE 4: CONSUMPTION OF FISH AND SHELLFISH BY FORM

	Any Form (%)	Fresh (%)	Frozen Packaged (%)	Smoked (%)	Canned (%)
BRISBANE	86	na*	na	na	na
TOWNSVILLE	91	97	42	32	87
CAIRNS	92	76	39	40	79
ROCKHAMPTON	95	81	47	23	77
BOWEN	98	76	32	28	78
MT ISA	90	70	51	21	65
CHARTERS TOWERS	86	66	42	26	69
HUGHENDEN	82	68	62	20	75
MAREEBA	100	92	31	11	74

* na - not available

3.4 Consumption Situation:

The majority of consumers preferred home consumption to eating fish and shellfish at a restaurant or from a take-away outlet - Table 5. In towns like Townsville, Cairns and Rockhampton where there were a larger number of restaurants serving fish and shellfish, the frequency of restaurant consumption was relatively higher. Consumption via take-away outlets was more popular in smaller towns like Bowen (74%) and Mareeba (72%). At Bowen, the incidence of high consumption frequencies in both take-away outlets and at home, is consistent with the high per capita consumption of this town (10.4 kg). At Hughenden in particular, take-away outlets were negligible and patronised by only a third of the households.

The existing consumption situation together with the socio-economic and demographic characteristics of a town are important aspects in the future planning of fish and shellfish restaurants or take-away outlets. For instance in rapidly growing cities like Townsville and Cairns where in addition, there is a fairly large influx of tourists, it would be most feasible to increase the number of restaurants and fast food outlets serving fish and shellfish.

TABLE 5: CONSUMPTION SITUATION

	Home	Restaurant	Take-away
BRISBANE (kg)	5.99	0.93	1.10
TOWNSVILLE (%)	88	12	61
CAIRNS (%)	87	13	60
ROCKHAMPTON (%)	86	14	61
BOWEN (%)	98	2	74
MT ISA (%)	91	9	41
CHARTERS TOWERS (%)	79	5	62
HUGHENDEN (%)	75	7	32
MAREEBA (%)	92	8	72

3.5 Consumption Frequency:

Urban centres with a coastal location, in most cases having ready access to direct supplies of fish and shellfish had a relatively higher per capita rate of consumption - eg Townsville (8.2 kg) and Cairns (8.6 kg) - Table 1. In contrast, inland towns like Charters Towers (5.5 kg) and Hughenden (4.7 kg) had low per capita rates of consumption. Of the inland towns, Mt Isa in particular proved an exception in that even though landlocked it received adequate supplies from the nearby Gulf of Carpentaria, thus enabling it to have a relatively higher rate of consumption (8.0 kg) than other inland towns. Economically it would be feasible to air freight supplies of fish and shellfish to a rapidly growing town such as Mt Isa. It would not be profitable to engage in similar marketing techniques at Hughenden or Charters Towers owing to the size of the town and its immediate hinterland.

The high per capita rate of consumption at Bowen (10.4 kg) is partly explained by the high incidence of recreational fishermen (71%) in this town.

3.6 Participation in Fishing:

Participation in fishing activity is another index of measurement of consumption which is often overlooked by official statistics. In the towns surveyed it was found that a third of the households were engaged in fishing activity, mainly for recreation. The majority of these fishermen were found to be of Greek descent. In the inland towns of Mt Isa, Charters Towers, Hughenden and Mareeba approximately one-fourth of the households were engaged in fishing. At Rockhampton, Townsville and Cairns just over a third of the households were engaged in fishing activity and at Bowen as much as 71 percent were recreational fishermen. For purposes of comparison it may be noted that in Brisbane 38 percent of the households were engaged in recreational fishing (Fish and Seafood Consumption in Australia, 1978).

TABLE 6: CHARACTERISTICS OF FISHING ACTIVITY

	CAIRNS	ROCKHAMPTON	BOWEN	MT ISA	CHARTERS TOWERS	HUGHENDEN	MAREEBA
% of all households in area	40.0	37.0	71.0	24.0	24.0	28.0	26.0
Major species caught (% households)*	Coral Trout (54) Red Emperor (35) Barramundi (33) Bream (26) Cod (23)	Whiting (40) Bream (33) Barramundi (29) Flathead (22) Salmon (19) Cod (18)	Coral Trout (34) Cod (34) Bream (26) Flathead (20) Mackerel (20)	Barramundi (84) Bream (53) Cod (26) Shark (19) Yellowbelly (16) Salmon (14)	Bream (87) Jew Fish (79) Sweetlip (8) Barramundi (8)	Yellowbelly (88) Bream (41) Jew Fish (18) Barramundi (12) Catfish (12)	Bream (70) Jew Fish (20) Coral Trout (20) Rainbow Trout (10) Grunter (10) Barramundi (10)
No. trips per household per year	6.64	5.60	14.40	0.74	2.77	1.85	1.38
Mean catch per household per year (kg)	124.6	103.8	94.5	11.7	n.a.	n.a.	n.a.
Mean catch per fishing trip (kg)	18.8	18.5	6.6	15.8	n.a.	n.a.	n.a.

* Multiple response answer

n.a. Not available

Except at Bowen there was no apparent difference in the frequency of consumption between those households involved with fishing and others, resulting from ready access to fresh seafood supplies. However there was a fairly close relationship between the percentage of households with fishermen and the proportion of seafood caught or received as a gift - Table 9.

Table 6 summarises some characteristics of the households involved in fishing activity. Whilst there was some variation in the species caught in the different areas, Bream appeared to be the most popular. The number of fishing trips per year varied from 0.74 in Mt Isa to 6.64 in Cairns. There were large variations in the mean catch per household per year: ranging from 11.7 kg in Mt Isa to 124.6 kg in Cairns. Some of these households included a few commercial fishermen. The average catch per trip varied between 6.6 kg in Bowen to 18.8 kg in Cairns. Thus overall there appears to be a greater interest in fishing at Cairns in particular.

3.7 Reasons for Non-Purchase:

Fish and shellfish compete with other forms of protein and meat in the normal diet. Although the incidence of fish and shellfish consumption is at present reasonably satisfactory in Queensland, there is no guarantee it will be the same in the future. Table 7 illustrates the main reasons for non-purchase of different forms of fish and shellfish (also see Figs II to V in Appendix).

From this Table it is evident that the main reason for non-consumption was the 'dislike' of the commodity. This means either there was a total dislike of the product or there was a preference for other forms of fish or meat. The large percentages recorded in the 'other' category was mainly due to the prevalence of recreational fishermen who had their own supplies. The 'poor availability' of fresh fish and shellfish was a significant indicator of low consumption frequencies in remote inland towns like Hughenden (25%). A smaller incidence of this same factor was recorded

at Charters Towers (6%), Mt Isa (6%) and Townsville (6%). Although the per capita consumption was somewhat higher in the latter two cities, still a small section of the population complained regarding the poor availability of fresh fish and shellfish.

Apart from the 'dislike' of the commodity and 'other' reasons given for non-consumption, the high price of the commodity was an important deterrent to consumption. Quite a significant proportion (92%) of the non-consumers of frozen fish and shellfish in Townsville in particular, attributed high price of the product as the main reason for non-consumption.

It is noteworthy that in Mt Isa, 'high price' is one of the major reasons for non-purchase. This could possibly be attributed to the extra air transport costs incurred in obtaining fresh fish and shellfish supplies from the Gulf of Carpentaria. This situation is unavoidable in interior locations such as Mt Isa.

At Mareeba, there were no complaints regarding price, availability or quality of fresh fish and shellfish. Those who did not purchase the commodity, caught their own supplies. In Mareeba, whilst there were a few non-consumers of frozen, smoked and canned fish and shellfish owing to high price, a significant proportion (24%) of the non-consumers complained regarding the 'low quality' of frozen fish and shellfish. The same applied to non-consumers at Charters Towers (14%) and Bowen (18%).

Overall, the general availability of fish and shellfish appeared fairly satisfactory, except in the case of isolated inland towns like Hughenden. The complete dislike of the commodity, owing to preference of other forms of fish and shellfish, other kinds of meat, dietary reasons, etc were the most predominant reasons for non-purchase.

TABLE 7: REASONS FOR THE NON-PURCHASE OF DIFFERENT FORMS OF FISH AND SHELLFISH

		High Price (%)	Poor Availability (%)	Low Quality (%)	Dislike (%)	Other (%)
TOWNSVILLE	Fresh	19	6	11	41	24
	Frozen	92	-	5	59	27
	Smoked	8	1	1	65	25
	Canned	6	-	-	74	21
CAIRNS	Fresh	-	-	-	16	84
	Frozen	6	1	9	67	37
	Smoked	2	2	3	66	27
	Canned	5	-	-	83	12
ROCKHAMPTON	Fresh	-	-	-	7	93
	Frozen	5	-	6	83	15
	Smoked	3	1	2	70	27
	Canned	10	-	-	82	11
BOWEN	Fresh	9	-	-	18	73
	Frozen	3	-	18	36	42
	Smoked	3	3	-	66	29
	Canned	10	-	-	50	50
MT ISA	Fresh	19	6	6	3	56
	Frozen	11	-	7	97	14
	Smoked	11	-	1	75	19
	Canned	7	-	-	59	40
CHARTERS TOWERS	Fresh	6	6	-	50	50
	Frozen	7	2	14	66	28
	Smoked	3	5	-	70	19
	Canned	18	-	-	65	24
HUGHENDEK	Fresh	-	25	12	25	38
	Frozen	-	-	8	83	17
	Smoked	-	-	-	-	100
	Canned	-	-	-	100	-
MAREEBA	Fresh	-	-	-	-	100
	Frozen	7	-	24	58	27
	Smoked	5	-	3	58	39
	Canned	10	-	-	40	50

NB Multiple responses were recorded

3.8 Restraints on Further Purchases:

The effect of high price on purchasing habits is further highlighted in Table 8 and Figs VI and VII in Appendix.

'High Price' was the most important or second most important factor affecting additional purchases of fresh fish and shellfish at all centres. This factor was more of a problem in the larger cities of Townsville, Cairns, Rockhampton and Mt Isa than in the smaller urban centres. A fairly significant group of consumers felt they were unable to purchase further supplies of fish and shellfish since they were now at the level of maximum consumption. This however may not necessarily be correct, it could be an illusion or a means of concealing the honest reason for restraints on additional purchases. Once again in inland towns like Charters Towers and Hughenden, the 'poor availability' was a leading reason for restricting additional purchases. The 'dislike' of the product itself or the option for other forms of fish and shellfish were the main restraints to additional purchases of frozen packaged supplies.

3.9 Sources of Supply:

The proportion of fresh fish and shellfish purchased from different retail outlets varied widely among different towns depending on the availability and efficiency of the organizing retail units. In all towns except Mt Isa and Hughenden, the 'fish shop' was the major source for purchases of fresh fish and shellfish - Table 9 and Figs VIII to XI in Appendix. In Brisbane too, the fish shop was patronised by a little over a third of the households. The probable reason for this could be the ease of access to fish shops which are usually fairly widely distributed in the urban area.

In Mt Isa, it was mentioned earlier that large consignments of fresh fish and shellfish were flown in by private suppliers (35%) from the Gulf of Carpentaria. At Hughenden the main

TABLE 8: RESTRAINTS ON FURTHER PURCHASES OF FRESH AND FROZEN SUPPLIES

		High Price (%)	Poor Avail- ability (%)	Low Quality (%)	On Maxi- mum con- sumption (%)	Prefer Other Forms (%)	No Special Reason (%)
TOWNSVILLE	Fresh	41	5	8	26	-	21
	Frozen	13	8	-	15	52	15
CAIRNS	Fresh	38	11	4	34	-	24
	Frozen	23	3	-	20	63	12
ROCKHAMPTON	Fresh	40	5	7	41	-	15
	Frozen	32	-	-	27	55	6
BOWEN	Fresh	24	13	3	47	3	31
	Frozen	12	-	-	44	31	19
MT ISA	Fresh	44	4	10	51	-	9
	Frozen	23	2	-	65	14	18
CHARTERS TOWERS	Fresh	26	32	6	23	-	33
	Frozen	12	2	-	7	44	42
HUGHENDEN	Fresh	37	61	2	20	-	10
	Frozen	19	-	-	54	44	3
MAREEBA	Fresh	36	11	6	14	-	34
	Frozen	33	-	-	8	67	34

NB Multiple responses were recorded

supplies of fresh seafood came through friends and relatives, or from their own fishing efforts (41%). At Charters Towers although the fish shop (47%) was the main supplier of fresh seafood, almost a fourth (24%) of the supplies came from private suppliers.

It is noteworthy that Queensland's prime official channel of marketing, the 'Queensland Fish Board', was not very popular among the consumers. It is only at Rockhampton that just over one-fourth of the consumers patronised the Fish Board. The varying significance of the Fish Board as a retailing outlet was probably due to the varying efficiency of the units in each town and its degree of competitiveness with other fish retail units.

TABLE 9 Continued

		Super Market	Hotel/ Pub	Fish Shop	Delicatessen	Fish Board	Friends, Relatives, Self	Fisherman	Private Supplier	Neighbourhood Store	Mobile Unit	Fish Market	Other
MT ISA	Fresh	25	7	27	3	1	2	1	35	-	-	-	7
	Frozen	88	-	-	1	-	-	-	-	-	-	-	10
	Smoked	40	-	3	57	-	-	-	-	-	-	-	-
	Canned	77	-	-	4	-	-	-	-	19	-	-	-
CHARTERS TOWERS	Fresh	9	12	47	-	6	12	5	24	-	-	-	2
	Frozen	93	-	-	-	2	-	-	-	-	-	-	7
	Smoked	100	-	-	-	-	-	-	-	-	-	-	-
	Canned	94	-	-	-	-	-	-	-	4	-	-	-
HUGHENDEN	Fresh	29	2	19	-	2	41	27	2	-	2	-	5
	Frozen	92	-	3	-	-	-	-	-	-	-	-	3
	Smoked	100	-	-	-	-	-	-	-	-	-	-	-
	Canned	100	-	-	-	-	-	-	-	-	-	-	-
MAREEBA	Fresh	26	-	32	-	5	5	5	8	-	16	-	3
	Frozen	100	-	-	-	-	-	-	-	-	-	-	-
	Smoked	100	-	-	-	-	-	-	-	-	-	-	-
	Canned	90	-	-	-	-	-	-	-	10	-	-	-

Irrespective of the size of the town, the 'supermarket' was a fairly popular outlet among most towns. In Cairns, Mt Isa, Hughenden and Mareeba, approximately one-fourth of the fresh seafood purchases were made at the supermarket. The 'mobile unit' or fish van which conveyed supplies of fish and shellfish from coastal areas to towns located further inland was a common feature at Mareeba and Hughenden. A major limitation in this system was the restriction in the choice of species and limited availability to the purchaser.

In most Queensland towns, the 'Fish Market' is not as yet a developed source of seafood retailing. Even in Brisbane only a small percentage of the purchases (6%) were made at the fish market (Fish and Seafood Consumption in Australia, 1978).

Other sources of supply such as the 'Hotel' or 'Pub' and direct purchases from the fishermen were of lesser importance. It may be noted however, that it is conceivable a few consumers were unwilling to admit their purchases direct from fishermen, owing to problems of legality of those purchases. Some of these responses may be recorded under 'other' in Table 9.

With reference to the major supply sources of frozen packaged, smoked and canned fish and shellfish, there was a clear dominance by one or two types of retail outlets.

The 'supermarket' predominated a significantly large proportion of sales in frozen, smoked and canned fish and shellfish. In frozen packaged fish, the next most important retail outlets were the 'fish shop' and the 'Fish Board'. The 'fish shop' and the 'delicatessen' were moderately popular retail outlets of smoked fish. At Mt Isa more than half the smoked fish purchases were made at the delicatessen. Cairns was another town where almost a fourth of the smoked fish was purchased through the delicatessen. This was mainly because of the better organised delicatessens in these towns.

For example, in Townsville, the second largest city of Queensland, there is the conspicuous absence of a separately established delicatessen. The only delicatessens available are those at supermarkets.

The 'neighbourhood store' was next in importance to the supermarket in the retailing of canned fish and shellfish. It was recorded that in most instances when quick meals or snacks were required the neighbourhood store was resorted to for canned seafood purchases. Hence the relatively low patronage of the neighbourhood store when compared with the supermarket. These trends in frozen, smoked and canned fish and shellfish retailing were found to be similar elsewhere in Queensland.

3.10 Availability:

The availability of a product to the consumer is another leading factor influencing purchasing behaviour. Table 10 illustrates the availability of fish and shellfish by form in each of the towns surveyed.

With regard to the availability of fresh fish, Hughenden in particular, was unsatisfied (61%) with the availability of supplies. Of the larger cities, Townsville's level of satisfaction with regard to the availability of fresh fish and shellfish was only moderately satisfactory (66%). In contrast the consumers at Cairns (80%) and Rockhampton (82%) and even Mt Isa (87%) had higher levels of satisfaction. In Townsville, whilst there is a fairly high demand for fresh fish and shellfish, the retail outlets have been rather restricted until very recently. A fairly significant proportion of the consumers at Charters Towers (39%) were unsatisfied with the fresh fish retailing units. Probably owing to this reason, a considerable proportion of the fresh fish supplies in Charters Towers was from 'friends, relatives or self' - Table 9.

With reference to frozen packaged fish and shellfish, once again Townsville (37%) registered its dissatisfaction together with Rockhampton (25%), Charters Towers (19%) and

TABLE 10: AVAILABILITY BY FORM

	FRESH (%)			FROZEN (%)			SMOKED (%)			CANNED (%)		
	S	U	N	S	U	N	S	U	N	S	U	N
TOWNSVILLE	66	20	14	57	37	6	83	15	2	93	6	1
CAIRNS	80	20	-	82	10	8	73	17	10	91	7	2
ROCKHAMPTON	82	15	3	73	25	2	88	9	4	96	1	2
BOWEN	71	29	-	37	12	50	71	21	7	97	-	3
MT ISA	87	12	1	89	5	5	40	54	6	81	14	5
CHARTERS TOWERS	61	39	-	62	19	19	85	15	-	93	3	4
HUGHENDEN	39	61	-	97	3	-	75	25	-	98	2	-
MAREEBA	81	16	3	83	8	8	100	-	-	93	7	-

[Satisfied (S)
 [Unsatisfied (U)
 [No opinion (N)

Bowen (12%) to a lesser extent. The level of dissatisfaction regarding the availability of smoked fish was highest at Mt Isa (54%) followed by Hughenden (25%). This is either the reason for or a consequence of the low proportion of smoked fish consumed in these two towns - Table 4. At the same time it is rather surprising that despite the relatively better organised delicatessens in Mt Isa (Table 9), there were complaints regarding the poor availability of smoked fish. A possible reason could be the high potential demand for smoked fish in Mt Isa. Further research would be required to establish this fact. In contrast there was a general consensus of opinion regarding the satisfactory level of availability of canned fish and shellfish in all towns.

3.11 Popular Varieties:

When examining consumption patterns, it is interesting to note the favourite species of the consumers on the one hand, and the species that are actually consumed on the other. The most favoured species among consumers need not necessarily be the most frequently consumed species. The latter would depend on the availability of the product.

First the species that are consumed more popularly are examined. Table 11 gives the popularly consumed species for Brisbane and all Australian capitals, for purposes of comparison with the author's research data.

According to Table 11, the most popular fish species consumed at home, in all capital cities including Brisbane were predominantly Tuna (18%) and Salmon (17%). Prawns (52%), Oysters (16%) and Crabs (13%) were the most popular shellfish species served at home in Brisbane. However, the trends in the towns outside the capital cities, were quite different - Table 12 and Fig XII, Appendix. Of the fresh fish, Barramundi was by far the most common species consumed and Prawns the most popular shellfish species. Mackerel and Coral Trout were next most popular in these towns, despite

TABLE 11: MOST POPULAR SPECIES SERVED AS A PERCENTAGE OF CONSUMPTION OCCASIONS FOR ALL CAPITAL CITIES AND FOR BRISBANE

	Served at home		Dining out		Takeaway		
	Rank	(%)	Rank	(%)	Rank	(%)	
ALL CITIES	1 Tuna	18	1 Whiting	17	na*		
	2 Salmon	17	2 Flounder	11			
	3 Fish Fingers	9	3 Snapper	8			
	4 Sardines	8	4 Bream	6			
	5 Cod	6	5 Salmon	5			
BRISBANE	Fish	1 Salmon	18	1 Barramundi	26	1 Cod	21
		2 Tuna	14	2 Whiting	8	2 Whiting	10
		3 Fish fingers	9	3 Salmon	4	3 Mullet	9
		4 Sardines	8	4 Bream	4	4 Bream	7
		5 Mullet	8	5 Flounder	3	5 Snapper	6
	Shellfish	1 Prawns	52	1 Prawns	42	1 Prawns	71
		2 Oysters	16	2 Seafood Cocktail	28	2 Scallops	12
		3 Crabs	13	3 Lobster	10	3 Crabs	10
		4 Seafood Cocktail	8	4 Oysters	10	4 Seafood Cocktail	2
		5 Scallops	7	5 Crabs	9		

Source: Department of Primary Industry, Canberra, 1978

TABLE 12: MOST POPULAR FRESH FISH AND SHELLFISH SPECIES SERVED AS A PERCENTAGE OF TOTAL HOUSEHOLDS

	Rank	Species	(%)		Rank	Species	(%)
TOWNSVILLE	1	Barramundi	54	MT ISA	1	Barramundi	65
	2	Prawns	50		2	Prawns	36
	3	Mackerel	38		3	Oysters	23
	4	Coral Trout	38		4	Coral Trout	16
	5	Crabs	37		5	Crab	16
CAIRNS	1	Barramundi	61	CHARTERS TOWERS	1	Barramundi	48
	2	Coral Trout	54		2	Bream	16
	3	Prawns	39		3	Mackerel	14
	4	Crab	32		4	Jew Fish	13
	5	Mackerel	30		5	Prawns	7
ROCKHAMPTON	1	Prawns	63	HUGHENDEN	1	Barramundi	65
	2	Barramundi	57		2	Prawns	32
	3	Crab	46		3	Crab	22
	4	Sweetlip	37		4	Yellowbelly	17
	5	Oysters	28		5	Whiting	12
BOWEN	1	Prawns	60	MAREEBA	1	Barramundi	67
	2	Mackerel	52		2	Mackerel	46
	3	Barramundi	48		3	Coral Trout	41
	4	Crab	48		4	Prawns	21
	5	Whiting	42		5	Salmon	18

* na - not available

the incidence of ciguatera poisoning associated with these two species. Among the shellfish, Crabs and then Oysters were the most favoured.

The frequency with which some of these species are consumed would depend greatly on availability and price of the product. Whilst Barramundi is one of the more expensive species of fish, it is extremely palatable and also somewhat 'prestigious' to be identified with the consumption of this product. On the otherhand, Coral Trout and Mackerel would suit more easily the average consumer's budget. Prawns, a much desired species of shellfish, can be described as an elastic commodity where consumption fluctuates with fluctuations in price.

The three most popular varieties of frozen packaged fish were fish fingers, Whiting and fish cakes in almost all the towns - Table 13 and Fig XIII, Appendix. According to the capital cities survey frozen packaged fish and fish fingers were served mainly on Fridays. In fact among all forms of fish, the most frequently served form on Fridays was frozen packaged fish, followed by smoked fish. Friday was the day on which fish was most often served, and it accounted for just over a fifth of all servings. It was found that in all cities, including Brisbane, the elderly and households with three or more children were more likely to follow the tradition of eating fish on Friday. Fish was served least often on Sunday and with a more or less constant frequency on the other five days of the week (Fish and Seafood Consumption in Australia, 1978).

As illustrated in Table 4, smoked fish was the least popular form of fish and shellfish. The species available were also limited. Haddock and Cod were the more popular species of smoked fish - Table 14 and Fig XIV, Appendix. The most frequent days of the week when smoked fish was served were Fridays and Saturdays (Fish and Seafood Consumption in Australia, 1978).

TABLE 13: MOST POPULAR FROZEN FISH AND SHELLFISH
SERVED AS A PERCENTAGE OF TOTAL HOUSEHOLDS

	Rank	Species	(%)		Rank	Species	(%)
TOWNSVILLE	1	Fish Fingers	36	MT ISA	1	Fish Fingers	41
	2	Fish Cakes	12		2	Fish Cakes	20
	3	Whiting	4		3	Cod	15
	4	Prawns	3		4	Prawns	12
					5	Whiting	5
CAIRNS	1	Fish Fingers	25	CHARTERS TOWERS	1	Fish Fingers	35
	2	Fish Cakes	13		2	Cod	6
	3	Coral Trout	11		3	Fish Cakes	5
	4	Whiting	7		4	Whiting	5
ROCKHAMPTON	1	Fish Fingers	42	HUGHENDEN	1	Fish Fingers	53
	2	Whiting	14		2	Fish Cakes	
	3	Cod	5		3	Whiting	20
			4		Flounder	8	
					5	Prawns	5
BOWEN	1	Fish Fingers	28	MAREEBA	1	Fish Fingers	21
	2	Whiting	10		2	Whiting	8
	3	Fish Cakes	8		3	Fish Cakes	5
	4	Prawns	4				
	5	Scallops	4				

TABLE 14: MOST POPULAR SMOKED FISH AND SHELLFISH SPECIES SERVED AS A PERCENTAGE
OF TOTAL HOUSEHOLDS

	Rank	Species	(%)		Rank	Species	(%)
TOWNSVILLE	1	Cod	15	MT ISA	1	Herring	12
	2	Haddock	12		2	Haddock	12
	3	Herring	9		3	Sprats	6
	4	Kippers	4		4	Cod	5
CAIRNS	1	Cod	18	CHARTERS TOWERS	1	Haddock	18
	2	Haddock	13		2	Cod	9
	3	Herring	9				
	4	Flounder	5				
ROCKHAMPTON	1	Cod	12	HUGHENDEN	1	Haddock	18
	2	Haddock	10		2	Cod	5
BOWEN	1	Haddock	22	MAREEBA	1	Cod	3
	2	Cod	6		2	Haddock	3
	3	Kippers	4		3	Herring	3

Of the canned fish, Salmon, Sardines and Tuna were the most popular varieties served - Table 15 and Fig XV, Appendix. Among the shellfish varieties, Oysters were by far the most popular. According to the Department of Primary Industry survey, the incidence of serving canned fish was found to be constant for each of the weekdays and dropped over the weekend. Since canned fish was mainly eaten at lunchtime, there was a steady frequency of consumption during the week-days.

The favourite seafood in the areas surveyed was by far, the Barramundi. The individual percentages of households favouring Barramundi were as follows: Mt Isa (84%), Hughenden (76%), Charters Towers (62%), Townsville (59%), Mareeba (54%), Rockhampton (52%), Cairns (40%) and Bowen (24%). Coral Trout was the next most popular species of fish followed by Whiting and Mackerel. Of the shellfish, prawns were the favoured species. However, contrary to popular belief, the popularity of prawns as a highly favoured food among consumers was disproved. Except at Mt Isa, where Prawns ranked as the second most favoured seafood, in all other areas Prawns were relegated far below several species of fish. In contrast, among those who dined at Restaurants, Prawns and Barramundi were the most favoured species of seafood.

3.12 Preparation for consumption:

As illustrated in Table 16 there was little variety in the methods of cooking fish at home. In Brisbane on 39 percent of occasions fish was served without cooking mainly in sandwiches and salads, and on another third of the occasions, fish was fried (Fish and Seafood Consumption in Australia, 1978).

In the towns outside the State capital, frying of fish was the most popular cooking method. This method varied in popularity from just over two-thirds of the households in Townsville and Cairns to more than 80 percent of the households in Mt Isa and Bowen. The next most popular preparation was grilling where approximately a third to a half of the households used this method.

TABLE 15: MOST POPULAR CANNED FISH AND SHELLFISH SPECIES SERVED AS A PERCENTAGE OF TOTAL HOUSEHOLDS

	Rank	Species (%)		Rank	Species (%)
TOWNSVILLE	1	Salmon 60	MT ISA	1	Salmon 43
	2	Tuna 45		2	Tuna 43
	3	Sardine 39		3	Sardine 35
	4	Oyster 21		4	Oyster 28
	5	Herring 19		5	Anchovy 12
CAIRNS	1	Salmon 61	CHARTERS TOWERS	1	Salmon 44
	2	Sardine 50		2	Sardine 36
	3	Tuna 42		3	Tuna 24
	4	Herring 25		4	Herring 15
	5	Oyster 21			
ROCKHAMPTON	1	Salmon 54	HUGHENDEN	1	Sardine 65
	2	Sardine 47		2	Salmon 50
	3	Tuna 44		3	Whiting 48
	4	Herring 22		4	Herring 32
	5	Oyster 13		5	Oyster 20
BOWEN	1	Salmon 62	MAREEBA	1	Tuna 54
	2	Sardine 56		2	Sardine 49
	3	Tuna 50		3	Salmon 46
	4	Herring 30		4	Herring 15
	5	Oyster 12			

As for shellfish, most of it was obtained in a form which could be consumed direct, such as in a salad. When further preparation was carried out by a few consumers, it was served as a mornay, a cocktail or a quiche etc. On the whole, there was a lack of enthusiasm in experimenting with fish cookery.

3.13 Influence of Socio-Economic Factors:

The relevance of socio-economic variables in this survey was discussed in section 2.3 and their distribution in section 3.1. The influence of these variables on consumption are examined here.

Household structure and size were found to have considerable effects on consumption levels. On the average the group

TABLE 16: PREPARATION OF SEAFOOD (COOKING METHODS)

	Brisbane* ¹	Townsville* ²	Cairns	Rockhampton	Bowen	Mt Isa	Charters Towers	Hughenden	Mareeba
FRY %	33	66	67	79	86	80	77	73	78
BAKE %	3	25	27	16	43	40	16	14	10
SALAD %	39	20	17	5	22	55	7	2	8
GRILL %	6	54	53	38	49	39	34	50	49
BOIL %	3	6	10	8	18	9	8	2	8
OTHER %	15	4	7	-	-	11	6	2	13

*1 Percentage of occasions fish and shellfish were served at home

*2 All other towns excluding Brisbane, percentage of households using a particular cooking method

NB Multiplerresponses were recorded

representing 'single adult' was found to consume more seafood than other groups. There were many in this group who consumed seafood mainly for dietary reasons, and an equally large number that dined out regularly and had seafood as the main meal. Lower levels of consumption were recorded in the group 'Adult couple with three or more children'. Since the percentage representation of these groups varied from town to town, the average consumption levels for individual towns also varied. No distinct preference for different forms of seafood could be identified according to differences in either household size or structure.

Age as a socio-economic factor had no bearing on the frequency of consumption. Indirectly however, it had somewhat of an effect via household composition and the size of the family. Among the 9 percent non-consumers of seafood, in Townsville, 52 percent had an income of less than \$6,000 per annum. Here, a major factor influencing their consumption habits could be monetary considerations. By way of occupation most of them were pensioners, retired widows or students. 43 percent of the remainder had an income of between \$6-15,000 and came from different walks of life. A small percentage (5%) of non-consumers belonged to the higher income groups. The latter households had a distinct dislike for fish even though they could afford it (Bandaranaike, 1978a).

The level of household income was closely related to the occupations of the householders. Total household income was found to affect consumption levels to a large extent. More generally, consumers having higher household incomes ate more fish and shellfish than those with lower incomes. Table 17 illustrates this feature for Mt Isa.

However, it is also evident that the top income group has not the highest consumption frequency, but those with an income of between \$10,001 and \$15,000. In Brisbane too it was found that cooked fish was consumed most in the income group of \$12,000 to \$17,999 and was significantly less

TABLE 17: FREQUENCY OF FISH AND SHELLFISH CONSUMPTION
AT HOME, BY HOUSEHOLD INCOME

Income Class (\$)	Mean Consumption Frequency (per mth)	% in Each Income Class
2,001 - 4,000	1.0	3.3
4,001 - 6,000	2.8	3.3
6,001 - 8,000	3.0	2.2
8,001 - 10,000	3.3	7.2
10,001 - 15,000	4.7	37.1
15,001 - 20,000	4.8	30.9
more than 20,000	5.3	16.0

in the income group of \$18,000 and more (Fish and Seafood Consumption in Australia, 1978).

The high incidence of frozen packaged fish among the middle income earners was purely a function of convenience among a group of white collar workers where often both husband and wife were employed. There was no marked differentiation among the income groups in the consumption of canned seafood. What was significant here was the very low consumption of canned fish and shellfish by people of Greek extraction who preferred mainly fresh seafood.

Although religion did not have a direct influence on consumption, it can be suggested that some of the more traditional Catholic households still prefer to consume fish on Fridays in preference to meat, probably as a matter of habit. This trend is more apparent among Catholics of overseas ethnic origin. Even though previously religion may have had some influence on the consumption habits of mainly Buddhist and Hindu migrants, these habits were found to have changed after a period of settlement in Australia. These households were in the minority and hence did not affect the sample very much.

Geographic mobility was found to have some influence on the level of seafood consumed and purchase preferences. It was found that migrants from the Mediterranean and Asian countries and also Northern Europe consumed relatively larger quantities of fresh fish and shellfish irrespective of their income grouping. Also, most British migrants were found to consume relatively larger quantities of smoked fish than any other community, probably due to a tradition brought over with them.

The inter-state householders, especially those who came from some of the larger towns, were found to have a distinct demand for readily available supplies of fresh seafood.

Some of the inter-state householders and migrants from overseas were getting their supplies of 'exclusive' seafood from their original places of residence. This was mainly due to the fact that in most of the towns surveyed there was a lack in the diversity of seafood products (in all forms) available in the market.

PART IV

Suggestions for the Future

Suggestions for future improvements in seafood marketing with the intention of benefitting the consumer are examined in this section. The analysis is based on rates of population growth and marketing strategies to be adopted.

It must be noted that since the towns analysed in this report were selected on the basis of their representativeness of other areas in Queensland (and elsewhere in Australia), the comments in this section should be considered more generally applicable to the Australian situation.

It is also assumed in consumption surveys such as this the general intention is to increase the existing consumption of the product. Suggestions were made by the author, on this basis.

4.1 Population Growth:

With the exception of the two smallest statistical divisions in Queensland, in all other divisions the rates of population growth were satisfactory - Table 18. The rate of growth was highest in the division of Moreton (20.19%) followed by Mackay (12.52%) in North Queensland. Other divisions with moderate rates of population growth were Wide Bay-Burnett (7.67%), and from Central and North Queensland, the Fitzroy (7.65%) and Far North (7.36%) Divisions. However, when comparing population changes between the periods 1971 to 1976 and 1976 to 1979, it is evident that except at Darling Downs, North Western and Brisbane City, the rates of increase have declined during the second period, 1976-1979.

Within the statistical division, some urban areas such as Mt Isa, had a population increase of 50.41 percent during the inter census period 1966-1971 and only a 0.99 percent increase during the period 1976-1979. The comparable percentages for Townsville were 10.52 percent (1966-1971) and 5.62 percent (1976-1979) and for Cairns 15.09 percent (1966-1971) and 3.28 percent (1976-1979). Thus overall there appears to be a slower rate of population growth in most urban centres throughout Queensland. On the otherhand,

TABLE 18: POPULATION BY STATISTICAL DIVISIONS OF QUEENSLAND

Division	Major Cities	Population 1971	Population 1976	Population Change 1971-1976 (%)	Estimated Population 1979	Population Change 1976-1979 (%)
Brisbane City	Brisbane	700,671	696,740	-0.56	702,000	0.75
Greater Brisbane	Ipswich	870,287	957,745	10.05	1,014,700	5.95
Moreton	Gold Coast	162,441	213,235	31.27	256,290	20.19
Wide Bay-Burnett	Bundaberg	137,888	152,095	10.30	163,760	7.67
Darling Downs	Toowoomba	148,795	155,313	4.83	164,950	6.20
South-west	Roma	30,620	27,876	-8.96	27,600	-0.99
Fitzroy	Rockhampton	115,158	126,395	9.76	136,070	7.65
Central-west	Longreach	15,198	14,063	-7.47	13,770	-2.08
Mackay	Mackay	65,523	77,038	17.57	86,680	12.52
Northern	Townsville	127,018	150,605	18.57	156,650	4.01
Far North	Cairns	110,274	124,661	13.05	133,830	7.36
North Western	Mt Isa	40,198	41,058	2.14	42,000	2.29
TOTAL QUEENSLAND		1,827,065	2,037,197	11.50	2,196,300	7.81

Compiled from ABS Statistics, 1980

with possible changes to the economic structure of these urban areas such as the growth of industry, establishment of casinos or international airports, future increases in population growth can be anticipated in the future.

These features together with the socio-economic structure of the population are important considerations when projecting the future demand for fish and shellfish.

In the more recent seafood consumption surveys conducted by the Department of Primary Industry, Canberra and that of the author's the per capita consumption rates identified were much higher than previous estimates of between 6 and 7 kg (Australian Bureau of Statistics, 1976-1976). It is conceivable that the average Australian is consuming more fish and shellfish than before. The discrepancy could also result from different techniques of calculating per capita consumption. For the purpose of this paper, it is not unreasonable to assume that there has been a general increase in fish and shellfish consumption over the past few years.

On average Queenslanders eat fish at home about once a week. Further, consumers appear more favourably disposed towards fresh fish - Table 4. Given the ready availability of fresh fish supplies it could be safely postulated that consumption levels should increase. There is also the possibility of introducing completely new seafood species for further expansion of the market.

Most unfortunately the present state of the fishing industry does not spontaneously support an increase in consumption. Some of the limitations in the industry together with possible solutions are discussed in the following section.

4.2 Marketing Implications:

Future demand for fish and shellfish supplies will depend to a large extent on the marketing strategies that are adopted to encourage further consumption.

Marketing strategies are directly linked to biological and economic considerations. If the potential catch is restricted either owing to resource limitations or commercial reasons, this would necessitate the altering of the marketing strategy. On the other hand, there could be changes in the cost of living and thereby the purchasing power of the consumer. Here too, adaptive marketing strategies would be essential.

Competition from other forms of meat and protein has always been a problem to the developing fishing industry. This could be partly eliminated through promotion campaigns which stress the nutritional value and dietary advantages in consuming seafood as against other forms of protein. Fortunately increasing numbers of consumers are becoming more aware of the nutritional value of seafood when compared with other forms of meat. This trend should be encouraged. When attempting to increase fish and shellfish consumption, local species should be encouraged. Sometimes due to the influx of cheap foreign fish such as the current flooding of the market with New Zealand perch, there is always the danger of losing the market for local varieties of fish.

Future demand for fish and shellfish will depend much on the availability of supplies. It was noted most consumers had a distinct preference to consume fish and shellfish in fresh form, than in other forms. However the fresh fish market in Queensland is far from favourably organised. A compatible marketing system could be achieved through a centrally organised marketing organisation controlled by the State, or through private enterprise. In Townsville, for example, over the past three years improvements in privately owned fresh fish retailing units have benefitted the consumer, but not completely. The situation is much the same in other coastal towns, and worse in the inland towns.

Unless fresh and frozen fish and shellfish are made more readily available potential consumer demand will remain unfulfilled or be directed to competing forms of food.

Availability can be improved in a number of ways. Since the majority of households opted for the purchase of fresh seafood, where possible direct purchase from the fishing wharf would greatly increase demand. In addition, in suitable areas on the beach-front, barbeque plates could be set out for the immediated cooking of seafood directly after its purchase. This should be most suitable to the tropical environment of Queensland.

As an alternative, seafood could be made available through well organised 'fish shops'. In the past, the location of the fish shop has usually been away from the centre of the city in the cheaper rental areas of the city or in suburbs. This has restricted access to some degree. Recently however, a few fish retailers being more aware of the advantages of ready access to the consumer, have located their seafood shops in shopping complexes - eg 'North Town' complex in the Flinders Mall, Townsville. Yet this is more the exception than the rule. The future trend in consumer shopping behaviour is towards one-stop shopping centres. A number of urban centres in Queensland are experiencing the onset of this trend. If independent fish retailing shops were located in these shopping complexes it would be extremely convenient for the consumer to purchase groceries and other household items together with fish or shellfish at the same time.

Today, where the automobile plays an important role in personal transport, adequate parking facilities are important. From this point the one stop shopping complexes are favoured further.

If suitable locations are available elsewhere with adequate parking facilities, separate seafood retailing units may be successfully established and patronised.

The establishment of a successful seafood retailing unit requires expertise in seafood purchasing, handling, storage and selling. Since this expertise is limited, the successful

operation of these retailing units are limited. In Australia most of the fish and chip shops are owned by persons of Mediterranean descent and are organised as a family concern. Owing to the increasing costs of overheads, most of these fish shops have been forced to diversify the products sold to the detriment of the main product - seafood. In addition, some of these fish shops have experienced rapid changes in ownership over a short period.

Together with availability of the product, other factors such as variety, quality, prices, display, are equally important influences on consumption.

Variety in species sold was lacking at most seafood retailing outlets in North and Central Queensland. As mentioned earlier, properly organised delicatessens were almost non-existent. In a country such as Australia, where there is a considerable proportion of migrants delicatessens would be most useful. Delicatessens should also indirectly facilitate improved methods of cooking seafood. It is a fact that in a mixed society, ideas on food preparation, use of new products etc are exchanged, and these market segments should be recognised.

Whilst fish fingers were found to be popular among the frozen packaged seafood, it was pointed out in a consumer survey that "the commercial method of making and coating small fingers in itself tends to produce a 50-50 to 60-40 ratio of fish to crumb, anyway" (Choice, 1981). Thus apart from its convenience the nutritional value of such products are questionable.

Owing to greater participation in the workforce by both husband and wife, it is likely that consumption of frozen packaged fish will increase faster than that of canned fish. This is predicted on the basis of possible increases in operating costs and short supplies in the local market of favoured species of canned fish such as tuna.

It will be necessary in the future to cater to ready packaging of filleted fish for quick preparation. It was noted that most households preferred small packages of seafood that can be utilised for one meal at a time. This would obviate the necessity to thaw and refreeze from large packages thus spoiling the flavour and risking bacterial infection. There was also a general agreement on the presentation of these packages - a transparent cover which enabled the consumer to view the product instantly.

The quality and the presentation of the product sold are equally important considerations. Among some householders there was a doubt regarding the quality of freshness in the product. This could affect future sales adversely. Proper presentation of the product in the market is lacking in most retail outlets of Queensland. The current ingress of New Zealand perch to the Australian market is a good example of the possible boost in sales as a result of competitive pricing and an attractive, convenient form of packaging.

Even though on an average, the largest proportion of a consumer's household budget is on food, price competitiveness is an important factor influencing consumption. Price will always remain a problem with export oriented species such as Prawns, where the current retailing price fluctuates widely depending on the international market. In order to encourage purchases by the bulk of middle income earners in the population, price of seafood must remain competitive.

Display of the product is an equally important factor in attracting potential buyers. This was sadly lacking in North and Central Queensland. There was a complete lack of imagination with regard to window displays and interior cabinet displays in the shops - a sharp contrast to most fish shops in Brisbane and other State capitals. In this respect most meat shops had a far superior display to those of fish shops.

With the exploitation of the 200 mile fishing zone, there is the possibility of introducing new species to the market. This kind of species diversification must be encouraged since some of the more favoured species are becoming scarce in the market. Production statistics indicate that catches of the most favoured species in Queensland, the Barramundi, are fast depleting. If this trend continues and there is no adequate replacement there is the danger that consumption rates could reduce drastically. Coral Trout and Mackerel are next most popular species especially in North Queensland. Here again if the incidence of ciguatera poisoning in these species spreads, there is the danger of lower consumption frequencies. It is not to say that the future of fish and shellfish consumption is bleak in Queensland, but these are some of the limitations that may have to be coped with in the future. It is encouraging to note that production of shellfish, mainly Prawns, Lobsters, and Crabs have increased steadily over the last five years. Increased production in Prawns and Lobsters however will affect the overseas market more than domestic consumption.

In the areas surveyed, even though a small proportion of the households eat seafood at restaurants, this trend is increasingly popular in most larger urban centres. Restaurant trade will flourish in towns of 100,000 or more. Seafood served at restaurants should be exclusive and well prepared in order to compete with other dishes on the same menu. Where possible the development of exclusively seafood restaurants should be encouraged. On the other hand, fish as a 'takeaway' food will be popular in both small and large towns. However, in this field seafood has to compete with other 'fast foods' and well organised retail units like 'Kentucky Fried Chicken'. In order to compete successfully among the 'takeaway' foods it is essential that the industry be able to provide continuously a supply of relatively cheap fish and have an acceptable price to the the consumer. Although in most developed countries such as the United States, a considerable proportion of the food budget is spent on food items prepared outside the home, it will take a while before this trend is established in Australia.

A major problem confronting most Australian towns located away from the coast is the lack of adequate fresh seafood supplies. The problem is further aggravated by the low population densities in these towns which could make the transport of seafood supplies economically non-feasible. Therefore, the provision of fish and shellfish supplies to isolated towns in the interior of Queensland can best be done through a centrally organised marketing unit controlled by the State government. Many private suppliers are hesitant to supply smaller markets not being fully aware of its potential for seafood consumption. If they did, being a small business concern, the price of the product will necessarily be high. In contrast a state-wide marketing organisation with possibly '*multiple-base pricing system*' may be able to rectify the situation to a large extent. A subsidised transport system in conjunction with adequate storage facilities in the inland location is a possible solution. Aquaculture in inland water bodies, natural or artificial is yet another solution to this problem. Further research is required prior to establishing a suitable seafood marketing system in inland towns.

It was noted from the survey that there was a general lack of knowledge regarding methods of cooking fish other than basic frying, grilling etc. More inventive methods of cooking seafood should be introduced to the consumer via the media, demonstrations and distribution of free recipes. General promotion activity to encourage further consumption of seafood has not hitherto been attempted in Australia. In contrast, for example in 1979, at Vancouver, Canada, the month of November was declared as a 'seafood month', all shopping centres had prominently displayed posters to the effect; seafood was offered at reduced prices, educational films on fishing were shown free, recipes and information on different species of seafood were distributed to every household and publicised through the media. The campaign proved extremely effective and the general education of the public on seafood vastly improved. It will be greatly advantageous to the industry as a whole to attempt a similar programme in Australia.

4.3 Conclusion:

The research has illustrated specific variations in seafood consumption patterns and attitudes, both spatially and among the different sectors of the populations. Whilst effects of friction of distance were well illustrated by the inland towns, there was further room for improvements in seafood retailing in all towns. The demographic and socio-economic background of the population was also seen to have its effects on consumption habits and trend.

In a competitive economic system, the survival and growth of an industry requires accurate knowledge about consumers - how they buy, what they buy and where they buy. Once these factors are known it is up to the marketing agents to satisfy the demands of the consumers accordingly. A major intention of this survey was to improve predictions concerning purchasing habits and attitudes to benefit all parties interested in the fishing industry. Therefore, it is hoped the background data in this survey will be utilised more fully in improving the industry in the near future.

In conclusion it can be said that there is a great potential in the Queensland market and if proper marketing strategies are adopted, and assuming there is a reasonable rate of population growth, the per capita consumption should increase further. One of the immediate changes required in Queensland is the organisation of a proper marketing channel for fresh fish supplies in particular. Latent demand will not be realised unless the marketing of fish is improved with immediate effect.

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APPENDIX

FIG. I LOCATION OF RESEARCH

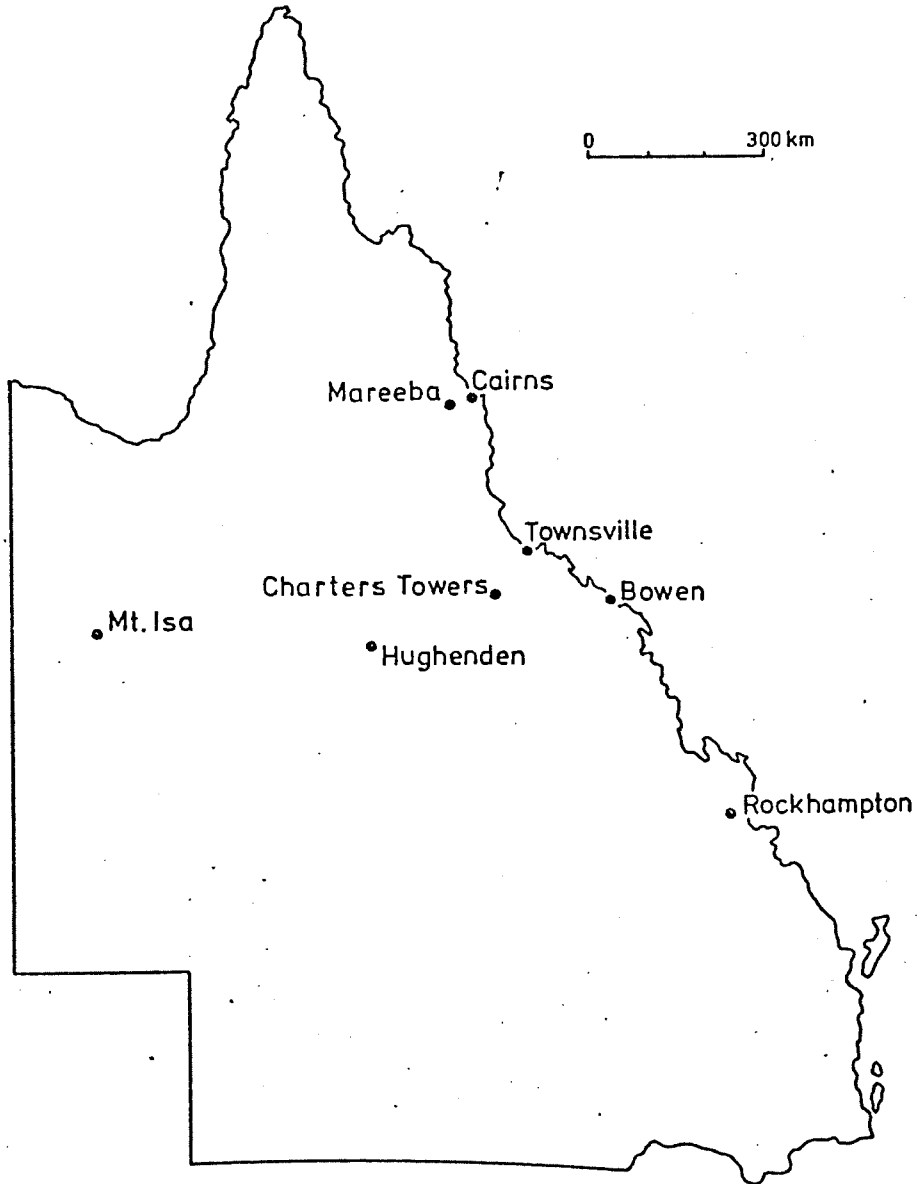


TABLE I Socio-economic Characteristics of Townsville

Occupation

Classification	%
Professional, Technical and Related Workers	18
Administrative, Executive and Managerial Workers	10
Clerical Workers	5
Sales Workers	3
Farmers, Fishermen, Hunters, Timbergetters and Related Workers	6
Miners, Quarrymen and Related Workers	1
Workers in Transport and Communication	5
Tradesmen, Production/Process Workers and Labourers	13
Service, Sport and Recreation Workers	1
Members of Armed Services	.11
Pensioners and Retired Persons	18
Unemployed (includes Students)	4
Inadequately Described or Not Stated	5
TOTAL	100

Household Number

Number	%
1	10
2	23
3	14
4	16
5	17
More than 5	20
TOTAL	100

Household Structure

Structure	%
Single Adult	9
Adult Couple	20
Adult Group	8
Single Adult + 1 child	2
Single Adult + 2 children	2
Single Adult + 3 or more children	1
Adult Couple + 1 child	7
Adult Couple + 2 children	16
Adult Couple + 3 or more children	30
Adult Group + 1 or more children	5
TOTAL	100

Income

Range	%
Less than \$2,000	8
\$2,000 - \$4,000	12
\$4,001 - \$6,000	9
\$6,001 - \$8,000	18
\$8,001 - \$10,000	24
\$10,001 - \$15,000	14
\$15,001 - \$20,000	11
More than \$20,000	4
TOTAL	100

Period of Residence in Townsville

Years	%
0 - 10	52
11 - 20	15
21 - 30	13
31 - 40	5
41 - 50	9
More than 50	6
TOTAL	100

Last Place of Residence

Location	%
Coastal Queensland	45
Inland Queensland	23
New South Wales	11
Victoria	6
South Australia	4
Western Australia	4
Northern Territory	1
Tasmania	1
ACT	-
New Zealand	-
Niugini	-
Europe	5
America	-
TOTAL	100

Religion

Religion	%
Catholic	28
Reformed Churches	56
Other Christians	7
Other Religions	2
No Religion	7
TOTAL	100

TABLE II Socio-economic Characteristics of Cairns

<u>Occupation</u>	
Classification	%
Professional, Technical and Related Workers	9
Administrative, Executive and Managerial Workers	6
Clerical Workers	7
Sales Workers	8
Farmers, Fishermen, Hunters, Timbergetters and Related Workers	4
Miners, Quarrymen and Related Workers	-
Workers in Transport and Communication	7
Tradesmen, Production/Process Workers and Labourers	29
Service, Sport and Recreation Workers	5
Members of Armed Services	-
Pensioners and Retired Persons	21
Unemployed (includes Students)	1
Inadequately Described or Not Stated	3
TOTAL	100

<u>Household Number</u>	
Number	%
1	7
2	28
3	13
4	21
5	17
More than 5	14
TOTAL	100

Period of Residence in Cairns

Years	%
0 - 10	52
11 - 20	15
21 - 30	12
31 - 40	8
41 - 50	6
More than 50	7
TOTAL	100

Income

Range	%
Less than \$2,000	3
\$2,000 - \$4,000	11
\$4,001 - \$6,000	7
\$6,001 - \$8,000	12
\$8,001 - \$10,000	18
\$10,001 - \$15,000	21
\$15,001 - \$20,000	17
More than \$20,000	11
TOTAL	100

Religion

Religion	%
Catholic	28
Reformed Churches	47
Other Christians	7
Other Religions	1
No Religion	17
TOTAL	100

Last Place of Residence

Location	%
Coastal Queensland	55
Inland Queensland	20
New South Wales	10
Victoria	5
South Australia	2
Western Australia	-
Northern Territory	2
Tasmania	-
ACT	-
New Zealand	-
Nuigini	4
Europe	2
America	-
TOTAL	100

TABLE III Socio-economic Characteristics of Rockhampton

<u>Occupation</u>	
Classification	%
Professional, Technical and Related Workers	10
Administrative, Executive and Managerial Workers	6
Clerical Workers	7
Sales Workers	10
Farmers, Fishermen, Hunters, Timbergetters and Related Workers	1
Miners, Quarrymen and Related Workers	-
Workers in Transport and Communication	10
Tradesmen, Production/Process Workers and Labourers	26
Service, Sport and Recreation Workers	4
Members of Armed Services	-
Pensioners and Retired Persons	21
Unemployed (includes students)	2
Inadequately Described or Not Stated	3
TOTAL	100

<u>Household Number</u>	
Number	%
1	9
2	26
3	19
4	21
5	13
More than 5	12
TOTAL	100

Period of Residence in Rockhampton

Years	%
0 - 10	26
11 - 20	13
21 - 30	15
31 - 40	15
41 - 50	16
More than 50	15
TOTAL	100

Income

Range	%
Less than \$2,000	-
\$2,000 - \$4,000	15
\$4,001 - \$6,000	6
\$6,001 - \$8,000	10
\$8,001 - \$10,000	23
\$10,001 - \$15,000	22
\$15,001 - 20,000	14
More than \$20,000	10
TOTAL	100

Religion

Religion	%
Catholic	38
Reformed Churches	53
Other Christians	2
Other Religions	-
No Religion	7
TOTAL	100

Last Place of Residence

Location	%
Coastal Queensland	73
Inland Queensland	21
New South Wales	2
Victoria	2
South Australia	1
Western Australia	-
Northern Territory	-
Tasmania	-
ACT	-
New Zealand	-
Nuigini	-
Europe	1
America	-
TOTAL	100

TABLE IV Socio-economic Characteristics of Bowen

<u>Occupation</u>	
Classification	%
Professional, Technical and Related Workers	10
Administrative, Executive and Managerial Workers	2
Clerical Workers	8
Sales Workers	12
Farmers, Fishermen, Hunters, Timbergetters and Related Workers	8
Miners, Quarrymen and Related Workers	-
Workers in Transport and Communication	10
Tradesmen, Production/Process Workers and Labourers	22
Service, Sport and Recreation Workers	6
Members of Armed Services	-
Pensioners and Retired Persons	20
Unemployed (includes Students)	-
Inadequately Described or Not Stated	2
TOTAL	100

Household Number

Number	%
1	4
2	22
3	22
4	24
5	14
More than 5	14
TOTAL	100

Household Structure

Structure	%
Single Adult	4
Adult Couple	20
Adult Group	8
Single Adult + 1 Child	2
Single Adult + 2 Children	-
Single Adult + 3 or more Children	4
Adult Couple + 1 Child	18
Adult Couple + 2 Children	16
Adult Couple + 3 or more Children	24
Adult Group + 1 or more Children	4
TOTAL	100

Income

Range	%
Less than \$2,000	-
\$2,000 - \$4,000	6
\$4,001 - \$6,000	10
\$6,001 - \$8,000	14
\$8,001 - \$10,000	20
\$10,001 - \$15,000	18
\$15,001 - \$20,000	16
More than \$20,000	16
TOTAL	100

Period of Residence in Bowen

Years	%
0 - 10	39
11 - 20	20
21 - 30	8
31 - 40	12
41 - 50	10
More than 50	11
TOTAL	100

Last Place of Residence

Location	%
Coastal Queensland	70
Inland Queensland	14
New South Wales	6
Victoria	6
South Australia	2
Western Australia	-
Northern Territory	-
Tasmania	-
ACT	-
New Zealand	-
Nuigini	2
Europe	-
America	-
TOTAL	100

Religion

Religion	%
Catholic	33
Reformed Churches	60
Other Christians	-
Other Religions	-
No Religion	7
TOTAL	100

TABLE V Socio-economic Characteristics of Mt Isa

<u>Occupation</u>	
Classification	%
Professional, Technical and Related Workers	12
Administrative, Executive and Managerial Workers	8
Clerical Workers	4
Sales Workers	16
Farmers, Fishermen, Hunters, Timbergetters and Related Workers	1
Miners, Quarrymen and Related Workers	20
Workers in Transport and Communication	2
Tradesmen, Production/Process Workers and Labourers	27
Service, Sport and Recreation Workers	3
Members of Armed Services	-
Pensioners and Retired Persons	5
Unemployed (includes Students)	2
Inadequately Described or Not Stated	-
TOTAL	100

Household Number

Number	%
1	2
2	17
3	22
4	31
5	16
More than 5	12
TOTAL	100

Household Structure

Structure	%
Single Adult	2
Adult Couple	17
Adult Group	2
Single Adult + 1 child	-
Single Adult + 2 children	2
Single Adult + 3 or more children	1
Adult Couple + 1 child	20
Adult Couple + 2 children	31
Adult Couple + 3 or more children	20
Adult Group + 1 or more children	5
TOTAL	100

Income

Range	%
Less than \$2,000	-
\$2,000 - \$4,000	3
\$4,001 - \$6,000	3
\$6,001 - \$8,000	2
\$8,001 - \$10,000	7
\$10,001 - \$15,000	37
\$15,001 - \$20,000	32
More than \$20,000	16
TOTAL	100

Period of Residence in Mt Isa

Years	%
0 - 10	45
11 - 20	20
21 - 30	27
31 - 40	6
41 - 50	1
More than 50	1
TOTAL	100

Last Place of Residence

Location	%
Coastal Queensland	35
Inland Queensland	23
New South Wales	15
Victoria	5
South Australia	2
Western Australia	3
Northern Territory	2
Tasmania	1
ACT	1
New Zealand	1
Nulgini	-
Europe	11
America	1
TOTAL	100

Religion

Religion	%
Catholic	27
Reformed Churches	41
Other Christians	4
Other Religions	-
No Religion	28
TOTAL	100

TABLE VI Socio-economic Characteristics of Charters Towers

Occupation

<u>Classification</u>	<u>%</u>
Professional, Technical and Related Workers	7
Administrative, Executive and Managerial Workers	3
Clerical Workers	4
Sales Workers	6
Farmers, Fishermen, Hunters, Timbergetters and Related Workers	3
Miners, Quarrymen and Related Workers	-
Workers in Transport and Communication	16
Tradesmen, Production/Process Workers and Labourers	14
Service, Sport and Recreation Workers	9
Members of Armed Services	-
Pensioners and Retired Persons	14
Unemployed (includes Students)	18
Inadequately Described or Not Stated	6
TOTAL	100

Household Number

<u>Number</u>	<u>%</u>
1	17
2	23
3	12
4	23
5	14
More than 5	11
TOTAL	100

Household Structure

<u>Structure</u>	<u>%</u>
Single Adult	17
Adult Couple	23
Adult Group	2
Single Adult + 1 child	-
Single Adult + 2 children	2
Single Adult + 3 or more children	2
Adult Couple + 1 child	7
Adult Couple + 2 children	22
Adult Couple + 3 or more children	22
Adult Group + 1 or more children	3
TOTAL	100

Income

<u>Range</u>	<u>%</u>
Less than \$2,000	16
\$2,000 - \$4,000	10
\$4,001 - \$6,000	12
\$6,001 - \$8,000	15
\$8,001 - \$10,000	15
\$10,001 - \$15,000	20
\$15,001 - \$20,000	8
More than \$20,000	4
TOTAL	100

Period of Residence in Charters Towers

<u>Years</u>	<u>%</u>
0 - 10	33
11 - 20	7
21 - 30	15
31 - 40	17
41 - 50	8
More than 50	20
TOTAL	100

Last Place of Residence

<u>Location</u>	<u>%</u>
Coastal Queensland	22
Inland Queensland	74
New South Wales	1
Victoria	1
South Australia	1
Western Australia	-
Northern Territory	1
Tasmania	-
ACT	-
New Zealand	-
Nuigini	-
Europe	-
America	-
TOTAL	100

Religion

<u>Religion</u>	<u>%</u>
Catholic	33
Reformed Churches	59
Other Christians	2
Other Religions	-
No Religion	6
TOTAL	100

TABLE VII Socio-economic Characteristics of Hughenden

<u>Occupation</u>	
Classification	%
Professional, Technical and Related Workers	5
Administrative, Executive and Managerial Workers	3
Clerical Workers	13
Sales Workers	15
Farmers, Fishermen, Hunters, Timbergetters and Related Workers	10
Miners, Quarrymen and Related Workers	2
Workers in Transport and Communication	18
Tradesmen, Production/Process Workers and Labourers	17
Service, Sport and Recreation Workers	2
Members of Armed Services	-
Pensioners and Retired Persons	8
Unemployed (includes Students)	-
Inadequately Described or Not Stated	7
TOTAL	100

<u>Household Number</u>	
Number	%
1	8
2	18
3	18
4	35
5	15
More than 5	6
TOTAL	100

<u>Household Structure</u>	
Structure	%
Single Adult	8
Adult Couple	18
Adult Group	3
Single Adult + 1 child	-
Single Adult + 2 children	2
Single Adult + 3 or more children	2
Adult Couple + 1 child	15
Adult Couple + 2 children	29
Adult Couple + 3 or more children	18
Adult Group + 1 or more children	5
TOTAL	100

<u>Income</u>	
Range	%
Less than \$2,000	-
\$2,000 - \$4,000	3
\$4,001 - \$6,000	17
\$6,001 - \$8,000	40
\$8,001 - \$10,000	18
\$10,001 - \$15,000	17
\$15,001 - \$20,000	3
More than \$20,000	2
TOTAL	100

Period of Residence in Hughenden

Years	%
0 - 10	38
11 - 20	13
21 - 30	15
31 - 40	10
41 - 50	12
More than 50	12
TOTAL	100

Last Place of Residence

Location	%
Coastal Queensland	30
Inland Queensland	67
New South Wales	3
Victoria	-
South Australia	-
Western Australia	-
Northern Territory	-
Tasmania	-
ACT	-
New Zealand	-
Nuigini	-
Europe	-
America	-
TOTAL	100

Religion

Religion	%
Catholic	44
Reformed Churches	51
Other Christians	-
Other Religions	-
No Religion	5
TOTAL	100

TABLE VIII Socio-economic Characteristics of Mareeba

Occupation

Classification	%
Professional, Technical and Related Workers	3
Administrative, Executive and Managerial Workers	3
Clerical Workers	3
Sales Workers	8
Farmers, Fishermen, Hunters, Timbergetters and Related Workers	6
Miners, Quarrymen and Related Workers	3
Workers in Transport and Communication	6
Tradesmen, Production/Process Workers and Labourers	22
Service, Sport and Recreation Workers	-
Members of Armed Services	-
Pensioners and Retired Persons	40
Unemployed (includes Students)	6
Inadequately Described or Not Stated	-
TOTAL	100

Household Number

Number	%
1	21
2	18
3	18
4	23
5	13
More than 5	7
TOTAL	100

Household Structure

Structure	%
Single Adult	21
Adult Couple	18
Adult Group	3
Single Adult + 1 child	-
Single Adult + 2 children	-
Single Adult + 3 or more children	5
Adult Couple + 1 child	15
Adult Couple + 2 children	18
Adult Couple + 3 or more children	15
Adult Group + 1 or more children	5
TOTAL	100

Income

Range	%
Less than \$2,000	-
\$2,000 - \$4,000	47
\$4,001 - \$6,000	-
\$6,001 - \$8,000	3
\$8,001 - \$10,000	14
\$10,001 - \$15,000	19
\$15,001 - \$20,000	11
More than \$20,000	6
TOTAL	100

Period of Residence in Mareeba

Years	%
0 - 5	18
6 - 10	11
11 - 15	16
16 - 20	26
21 - 25	11
26 - 30	13
More than 30	5
TOTAL	100

Last Place of Residence

Location	%
Coastal Queensland	42
Inland Queensland	50
New South Wales	3
Victoria	-
South Australia	-
Western Australia	-
Northern Territory	-
Tasmania	-
ACT	-
New Zealand	-
Nuigini	-
Europe	5
America	-
TOTAL	100

Religion

Religion	%
Catholic	48
Reformed Churches	41
Other Christians	8
Other Religions	3
No Religion	-
TOTAL	100

FIG II REASONS FOR THE NON-PURCHASE OF FRESH FISH AND SELLFISH

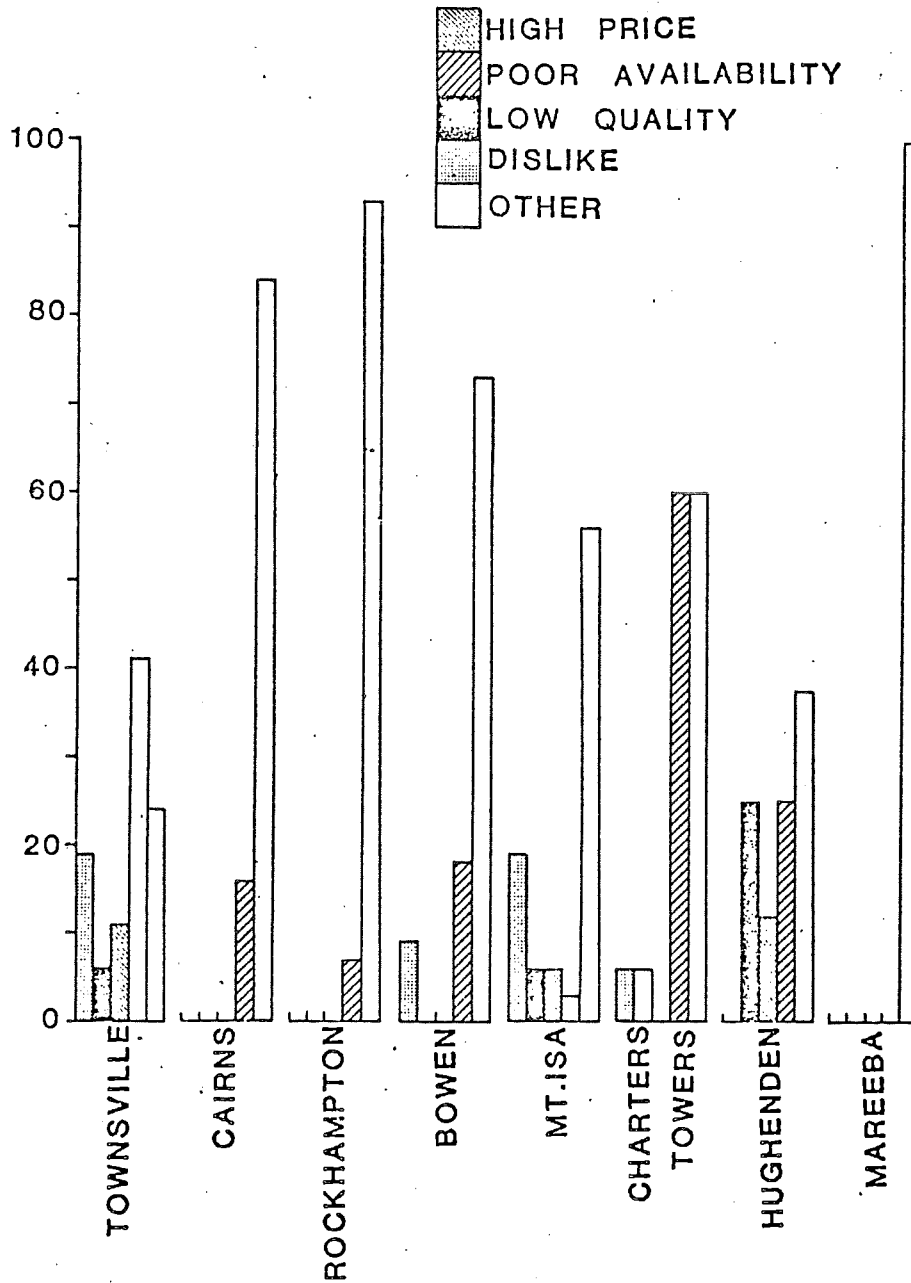


FIG III REASONS FOR THE NON-PURCHASE OF FROZEN FISH AND SHELLFISH

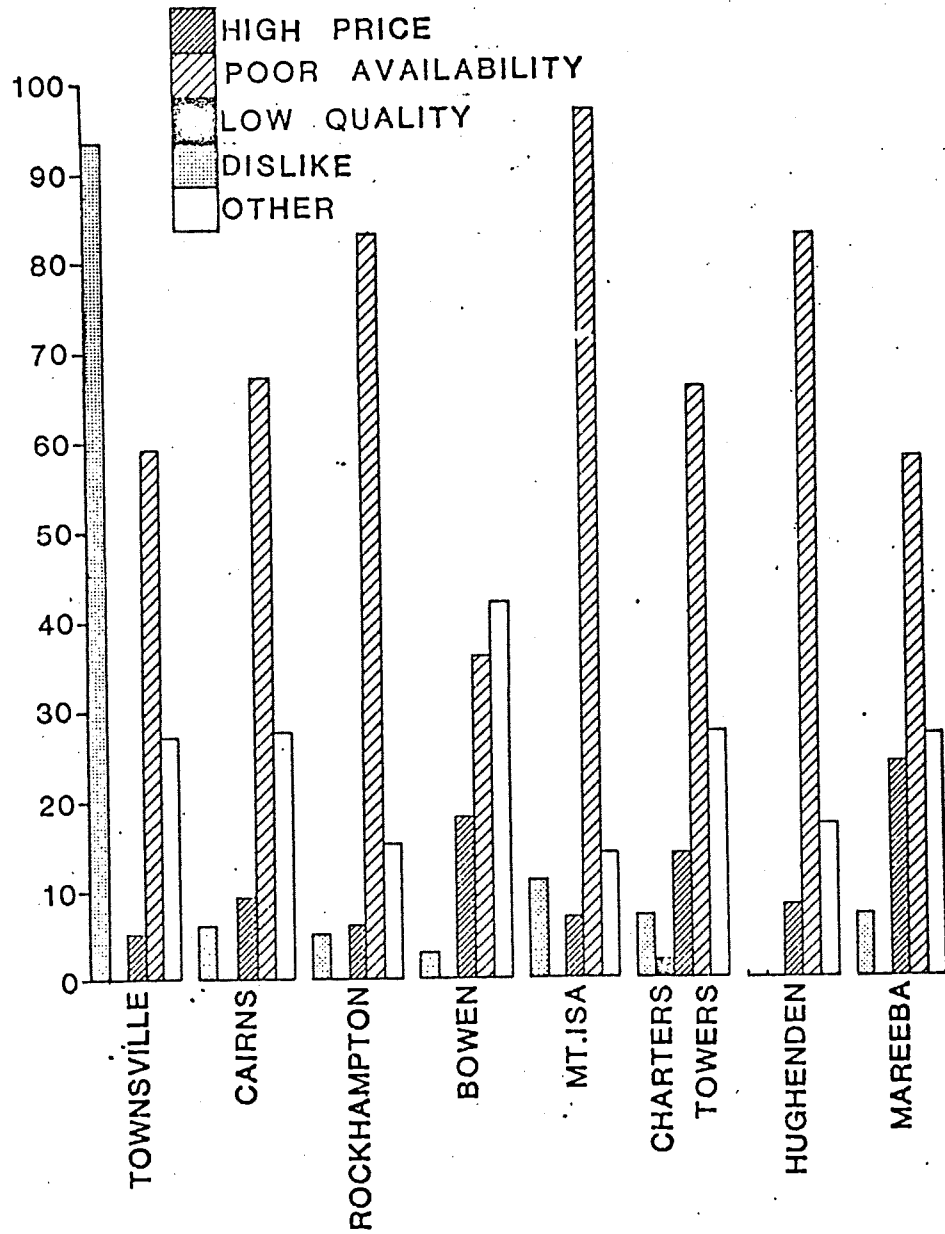


FIG IV REASONS FOR THE NON-PURCHASE OF SMOKED FISH AND SHELLFISH

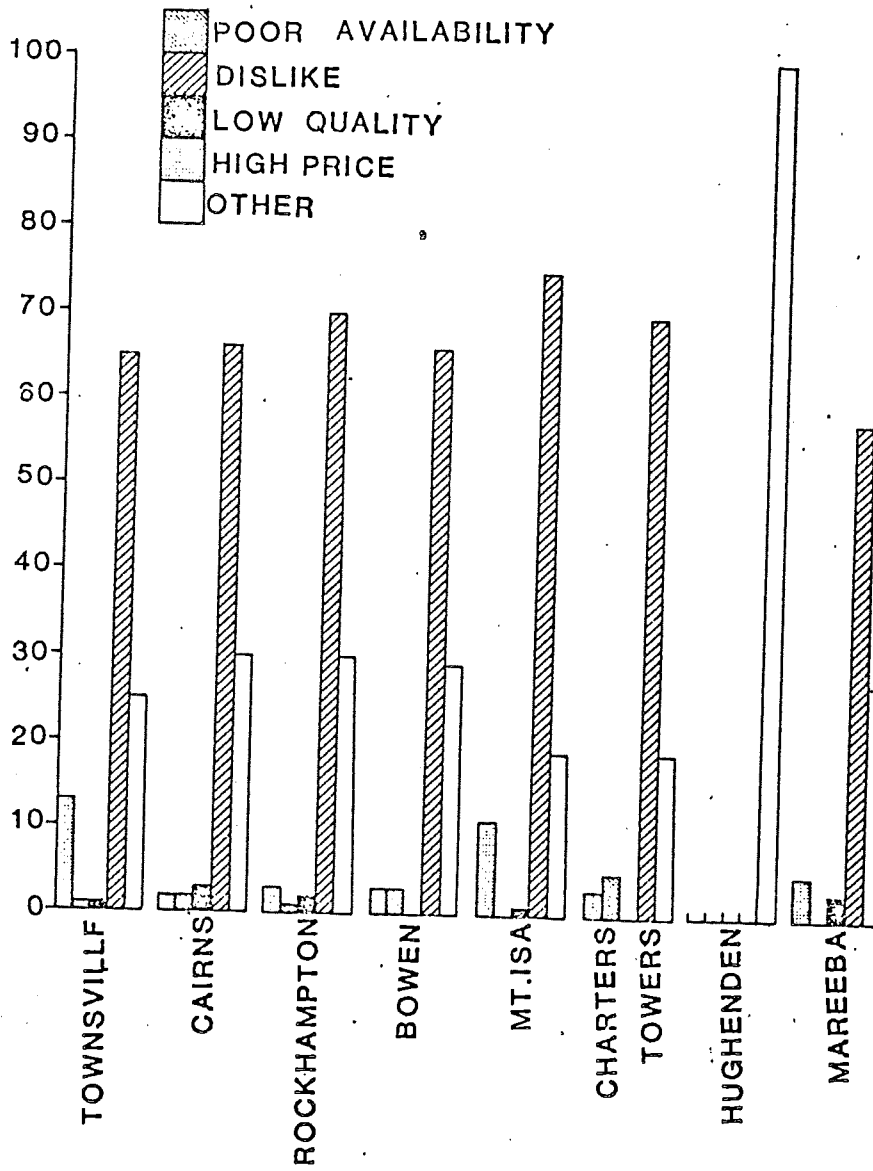


FIG. V REASONS FOR THE NON-PURCHASE OF CANNED FISH AND SHELLFISH

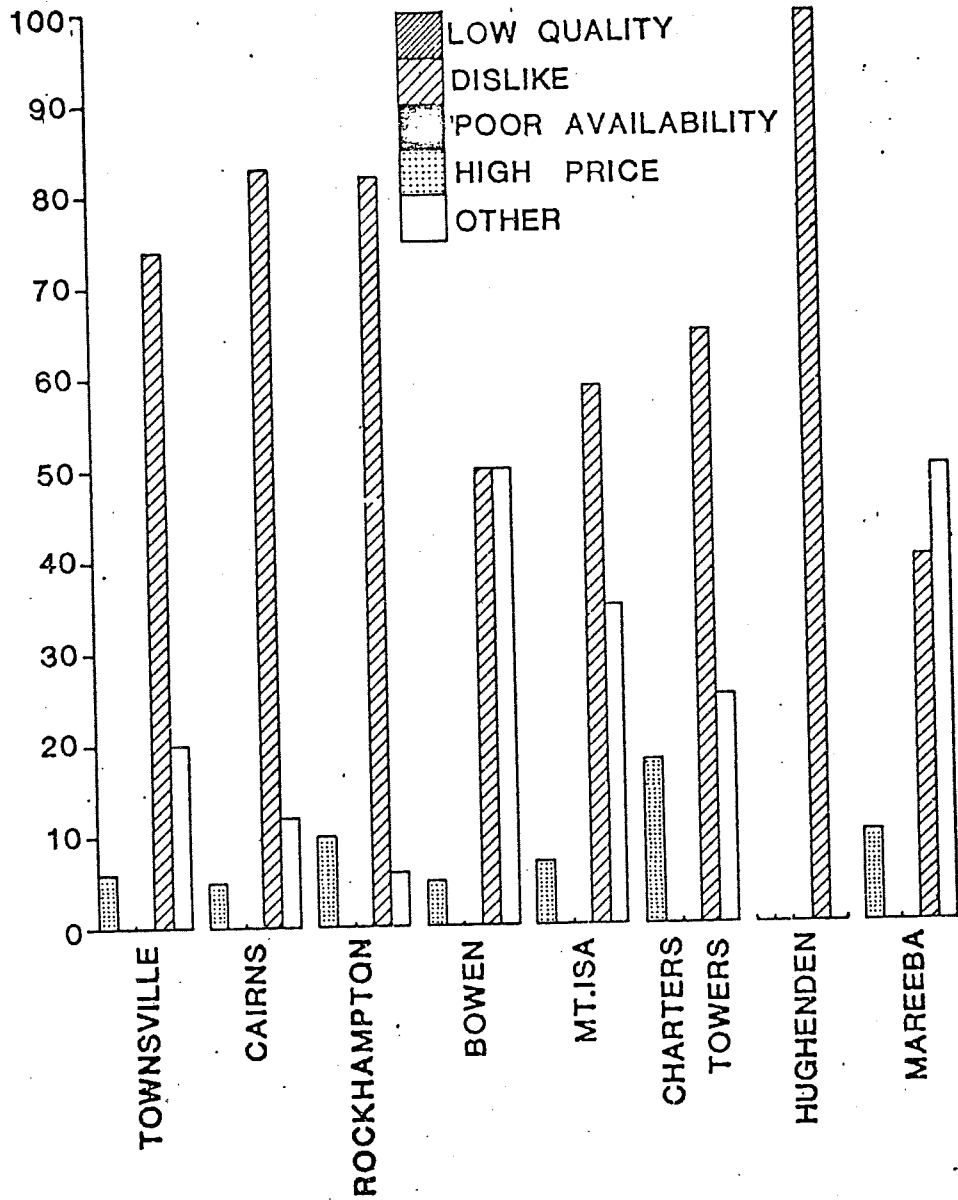


FIG. VI RESTRAINTS ON FURTHER PURCHASES OF FRESH SUPPLIES

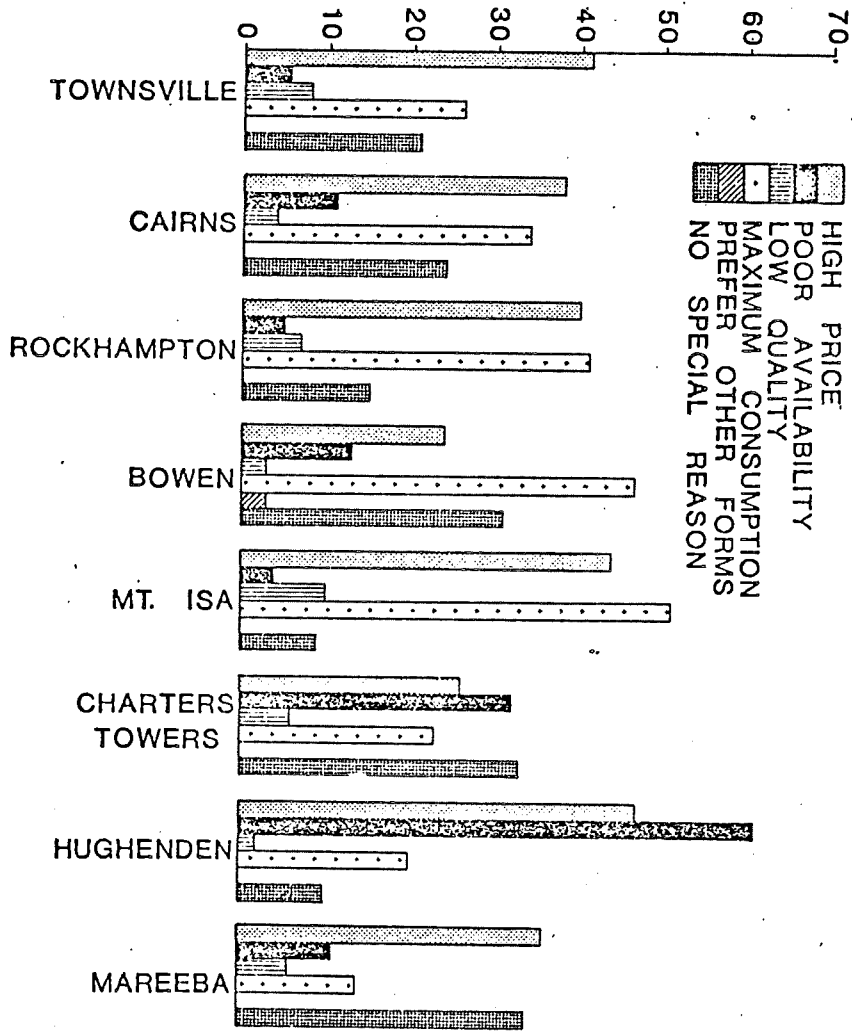


FIG VII RESTRAINTS ON FURTHER PURCHASES OF FROZEN SUPPLIES

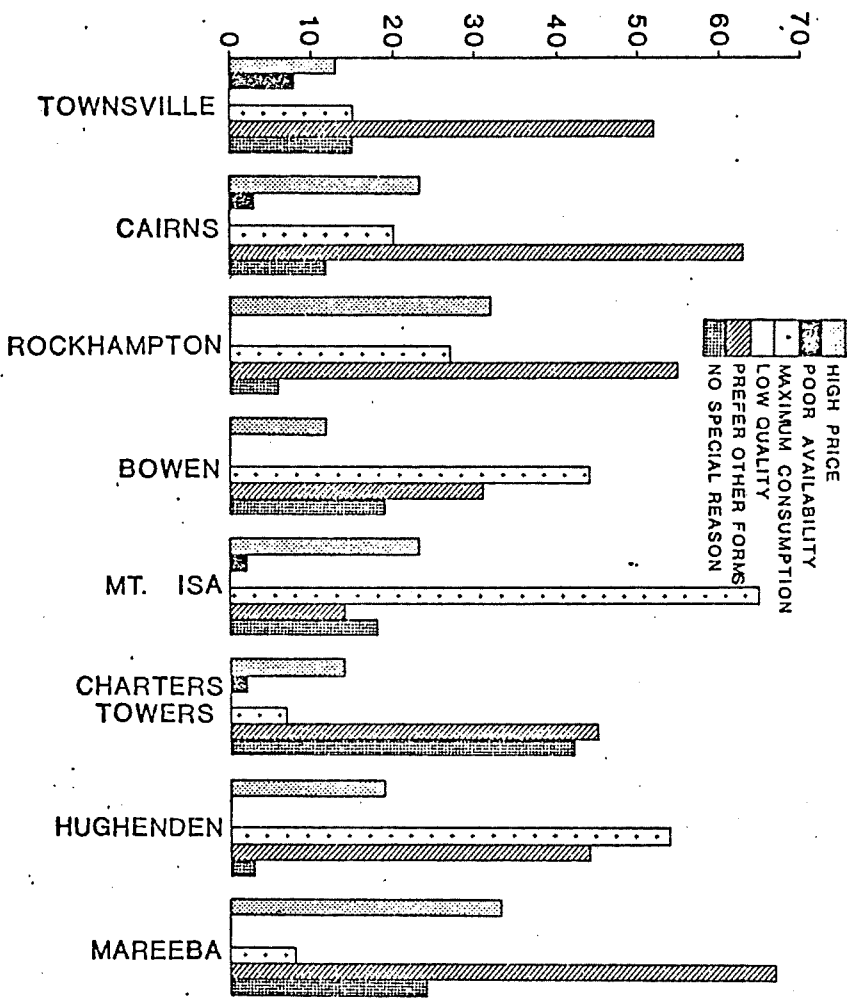


FIG. VIII SOURCES OF FRESH SEAFOOD SUPPLIES

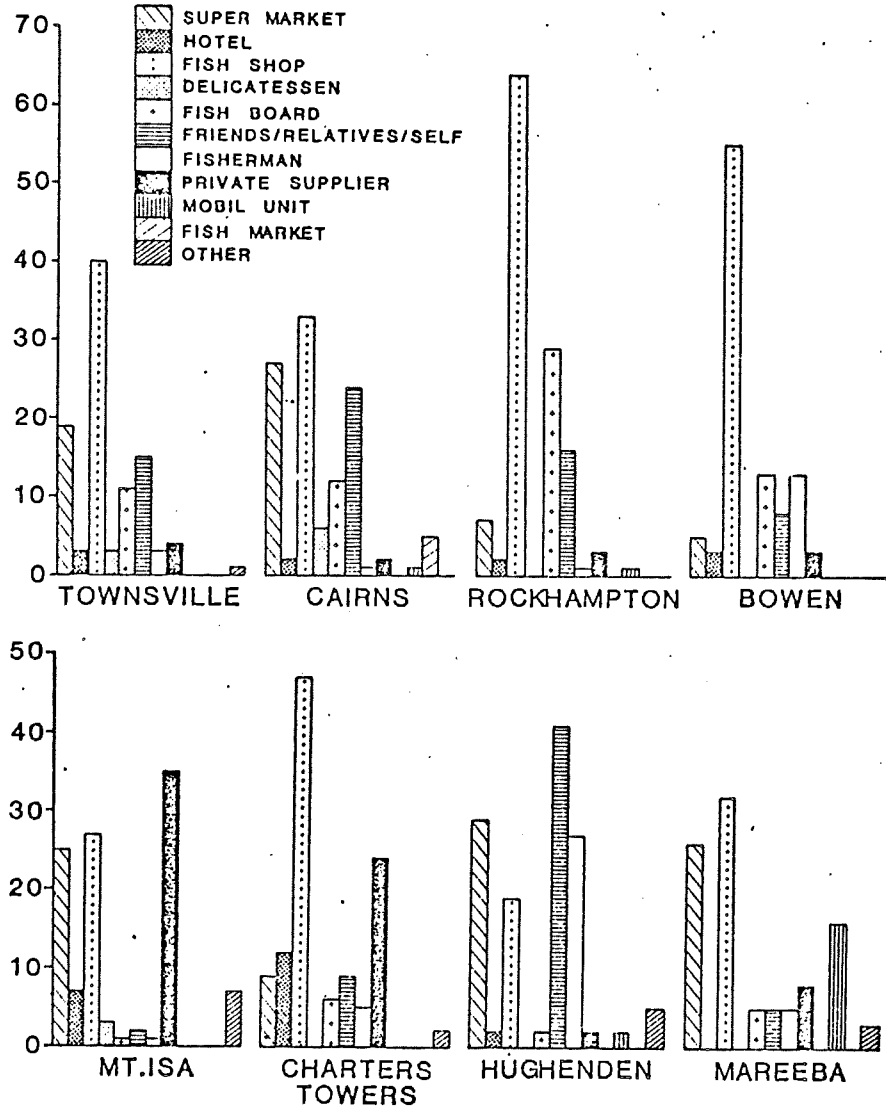


FIG. IX SOURCES OF FROZEN SEAFOOD SUPPLIES

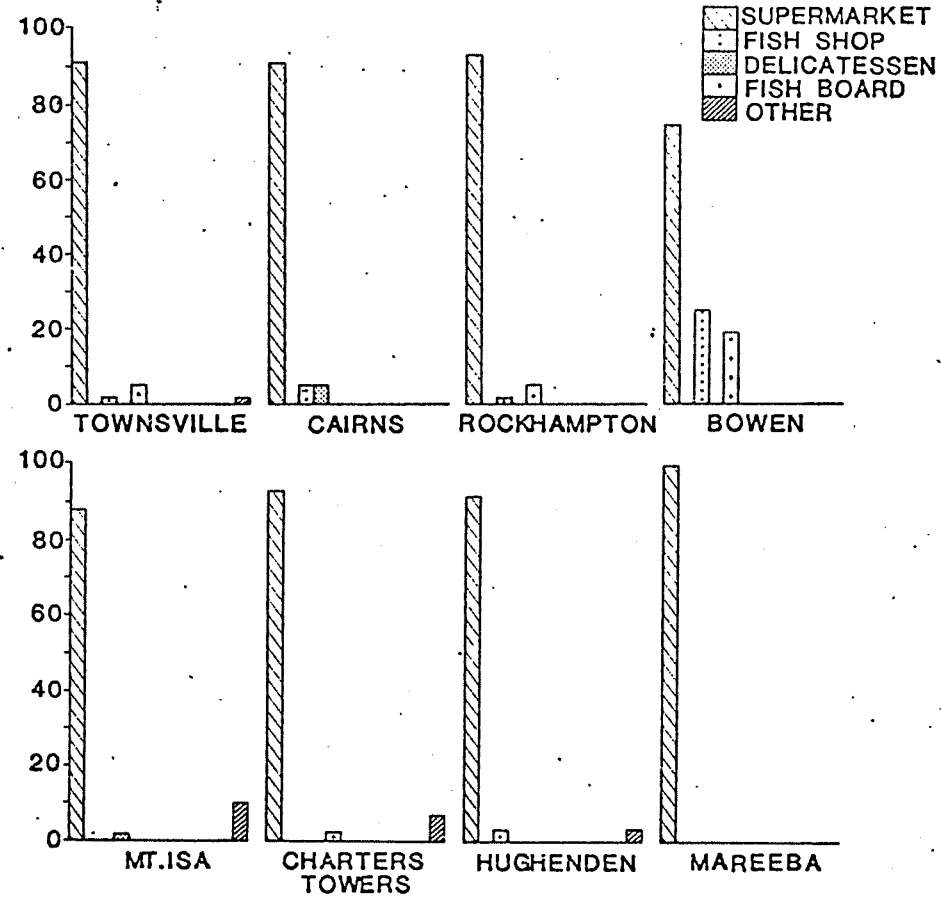


FIG. X

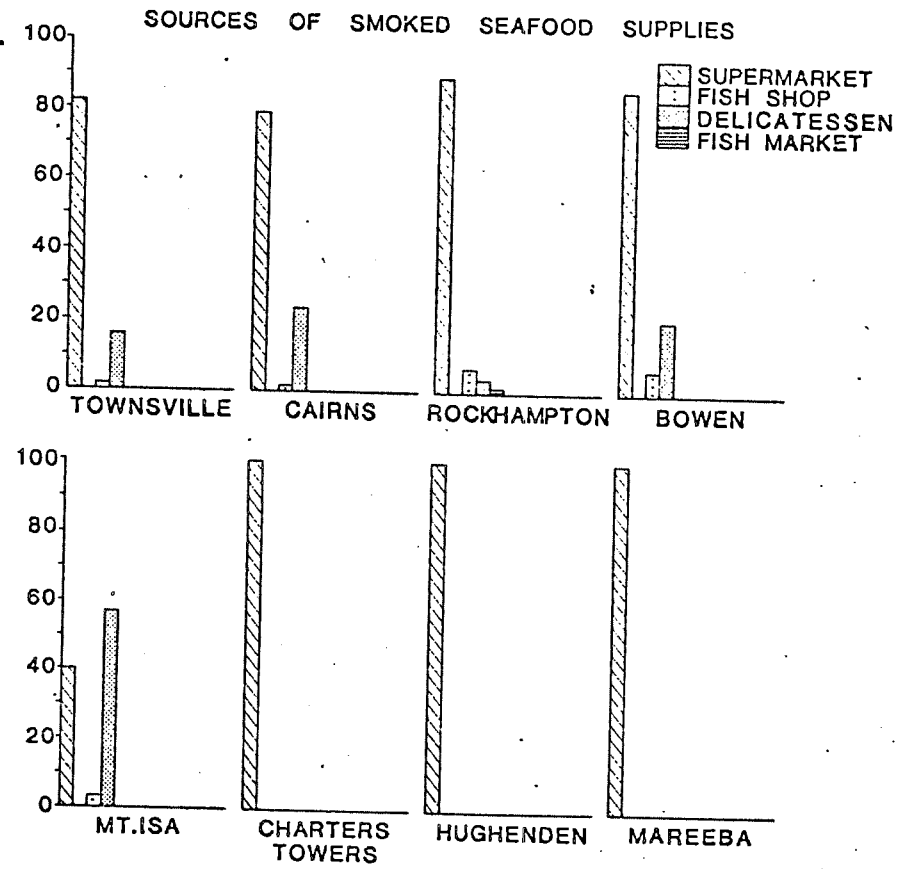


FIG. XI

SOURCES OF CANNED SEAFOOD SUPPLIES

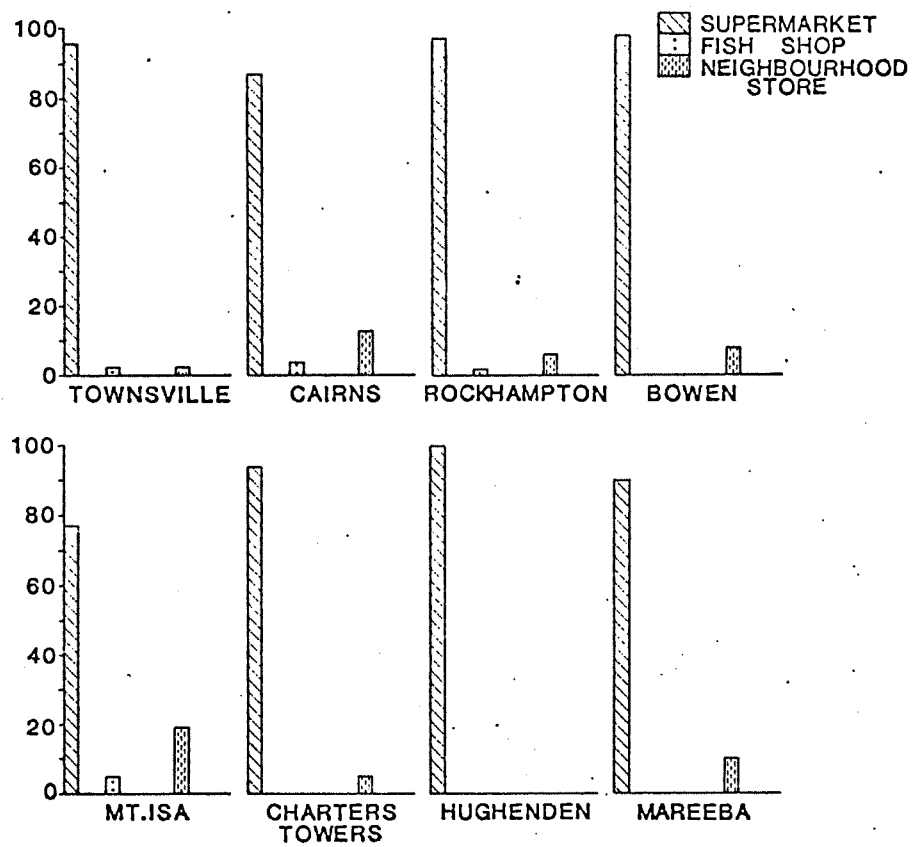


FIG. XII MOST POPULAR FRESH FISH AND SHELLFISH SPECIES SERVED AS A PERCENTAGE OF TOTAL HOUSEHOLDS

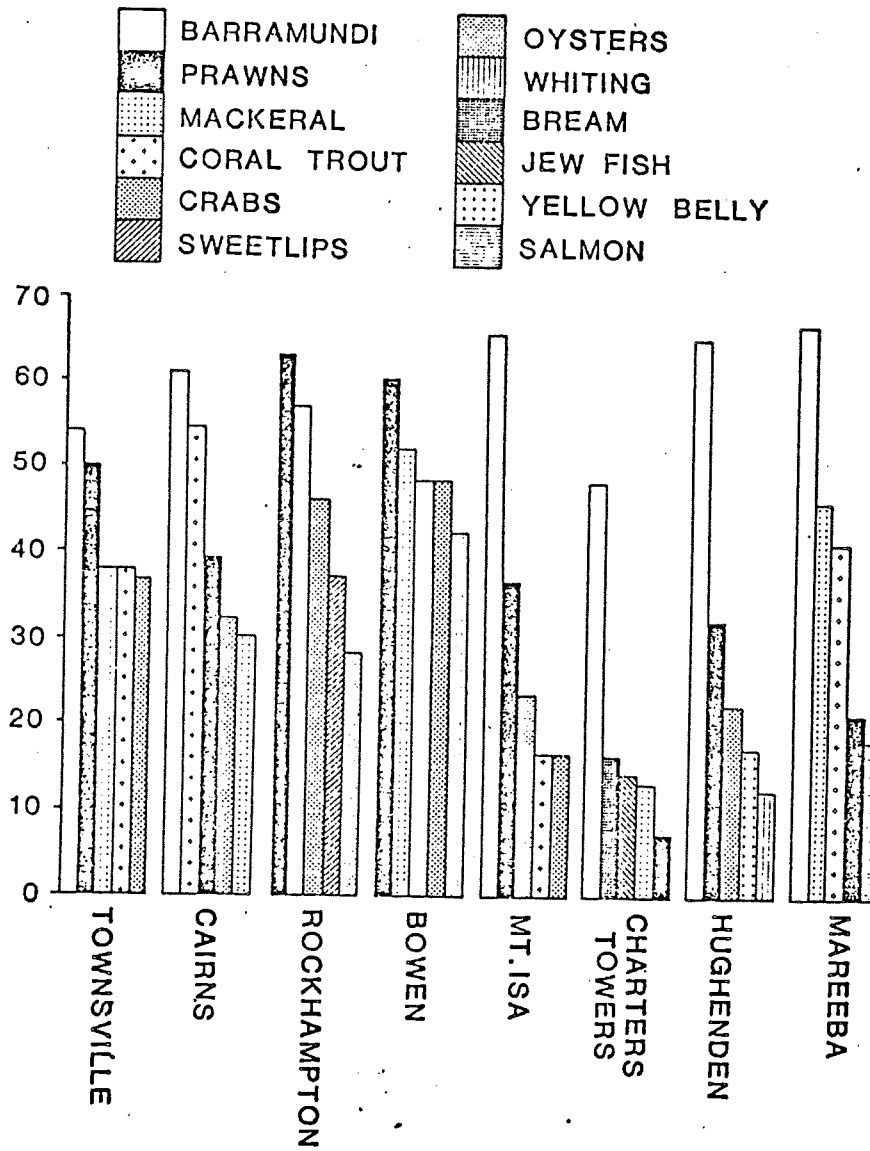


FIG. XIII MOST POPULAR FROZEN FISH AND SHELLFISH SPECIES SERVED AS A PERCENTAGE OF TOTAL HOUSEHOLDS

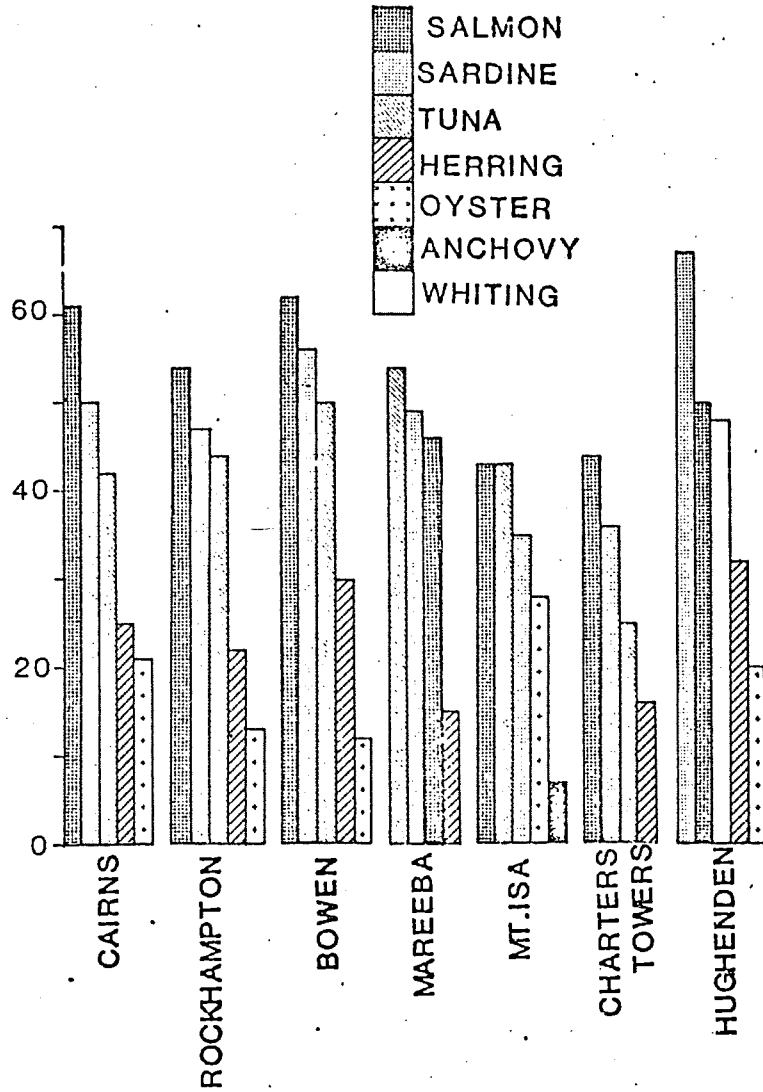


FIG. XIV MOST POPULAR SMOKED FISH AND SHELLFISH SPECIES SERVED AS A PERCENTAGE OF TOTAL HOUSEHOLDS

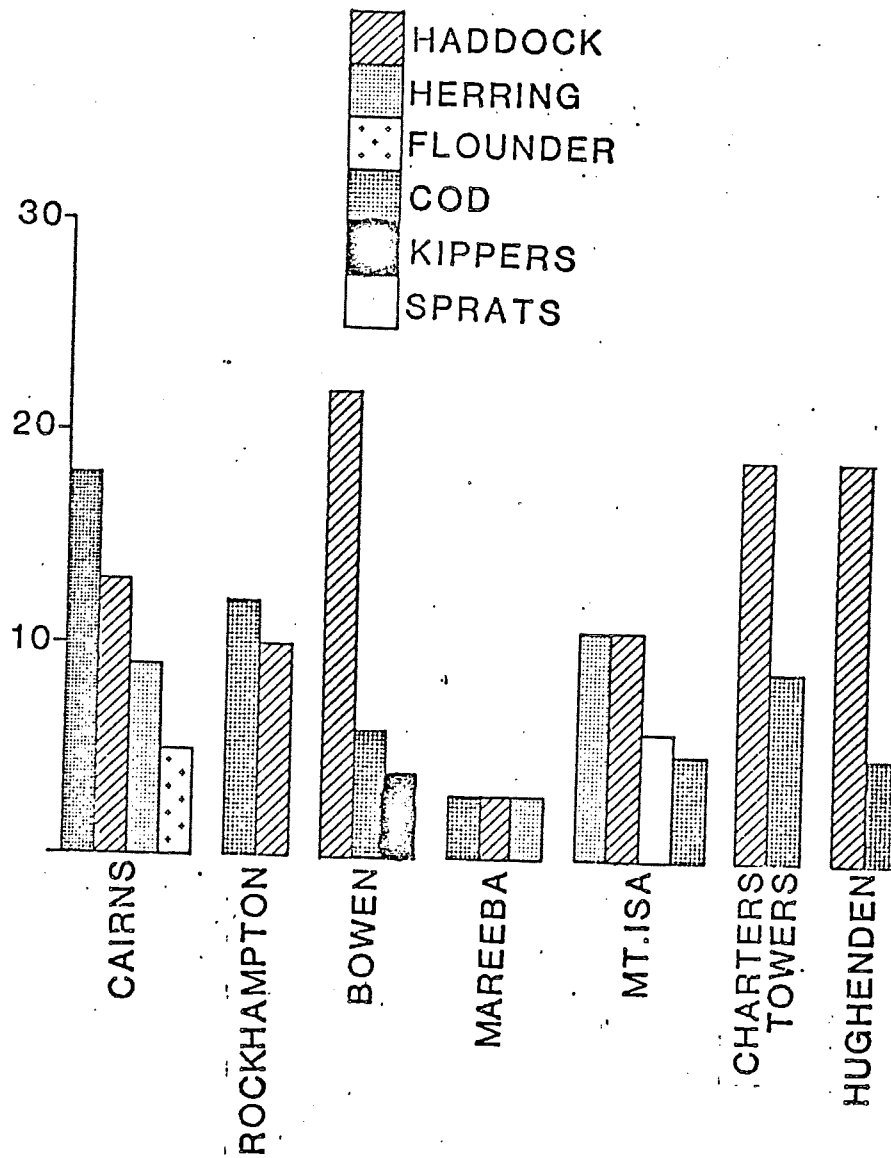


FIG. XV MOST POPULAR CANNED FISH AND SHELLFISH SPECIES AS A PERCENTAGE OF TOTAL HOUSEHOLDS

