

FISHING INDUSTRY RESEARCH AND DEVELOPMENT COUNCIL

National Seafood Consumption Study:

**In and Out-of-Home and Institutional
Consumption**

July 1992

PA Consulting Group
76 Kings Park Road
West Perth Western Australia
6005
Australia

Telephone (09) 481 2301
Fax (09) 324 1126
Ref: 631105/In/Out of Home Cons

CONTENTS

GLOSSARY OF TERMS USED	8
1. SUMMARY	10
2. SUMMARY OF METHODOLOGY	29
2.1 Overview of Methodology	29
2.2 In-Home and Out-of-Home Consumption Study Methodology	33
2.2.1 The In-Home and Out-Of-Home Questionnaires	33
2.2.2 Weighting Procedures - In-Home and Out-Of-Home Sample	36
2.2.3 Sample Characteristics - In-Home and Out-Of-Home Sample	38
2.3 Institutional Consumption Study Methodology	45
2.3.1 The Institutional Study Questionnaires and Sampling	45
2.3.2 Weighting Procedures - Institutional Sample	47
2.4 Classification of Fish and Seafood and Forms of Purchase	49
2.5 Estimation of the Weight of Fish/Seafood Consumed	51
2.6 Differences in 1990/91 Versus 1977 Study Methodologies	53
3. DETAILED FINDINGS - IN, OUT-OF-HOME AND INSTITUTIONAL CONSUMPTION	54
Overview	54
3.1 Fish and Seafood Consumption Results In-Home and Out-Of-Home	58
3.1.1 In and Out-Of-Home Consumption 1977 Versus 1990 Study	58
3.1.2 Form of Fish and Seafood Consumed Per Person by Where Consumed	60
3.1.3 Consumption According to Region and Form of Purchase	64

3.2	Frequency of Consumption of Fish and Seafood	66
3.2.1	Households Never Eating Fish and Seafood	66
3.2.2	Persons Never Eating Fish and Seafood	69
3.2.3	Proportion of Households Consuming Fish and Seafood in the last seven days	71
3.2.4	Frequency of Fish or Seafood Consumption In-Home	73
3.2.5	Frequency of Fish and Seafood Consumption Out-Of-Home	75
3.3	Average Serve Size and Price - In-Home Meals	81
3.3.1	Weight of an Average Serving of Fish or Seafood	81
3.3.2	Price Per Serve of Fish or Seafood	85
3.4	Some Factors Affecting Consumption In and Out-Of-Home	88
3.4.1	Consumption by Household Income and Number of Income Earners	88
3.4.2	Consumption by Religious Group	92
3.4.3	Consumption by Household Composition	94
3.4.4	Consumption by Country of Origin	97
3.5	Consumption in Institutions	102
4.	DETAILED FINDINGS - IN-HOME STUDY	105
4.1	Fish/Seafood Meals Consumed In-Home	105
4.1.1	Proportion of In-Home Meals in which Fish or Seafood was Consumed in the Previous Seven Days	105
4.1.2	When In-Home Meals are Consumed	109
4.1.3	The Number of People Eating at In-Home Fish/Seafood Meals	111
4.2	Product Usage by Occasion, Season, Species, Type and Form of Fish or Seafood	114
4.2.1	Form of Fish and Seafood Eaten In-Home by Meal-Occasion	114
4.2.2	Species/Types of Fish or Seafood Eaten by Season	124
4.2.3	Species/Types of Fish and Seafood Consumed In-Home	127

4.3	Purchase Behaviour	139
4.3.1	Where Each Form of Fish and Seafood is Purchased	139
4.4	Product Preparation for In-Home Consumption	145
4.4.1	Proportion of In-Home Fish/Seafood Meals which are Cooked in the Home Versus Bought Precooked	145
4.4.2	How Different Forms of Fish and Seafood are Cooked/Prepared/Served In-Home	146
4.4.3	The Use of Recipes in the Preparation of In-Home Fish and Seafood Meals	153
4.5	Purchaser Attitudes - In-Home Consumption	155
4.5.1	Attitudes to Retail Outlets	155
4.5.2	Attitudes to Fresh and Frozen Fish when Purchasing	162
4.5.3	Alternatives for Preferred Species	167
4.5.4	Common Perceptions of Fish and Seafood	168
4.5.5	Suggested Industry Actions to Increase Household Fish/Seafood Consumption	181
4.6	Respondent Protein Source Preferences	184
4.6.1	Preferred Dishes by Meal-Occasion	184
4.6.2	Fish/Seafood Meals Respondents Would Most Likely Prepare	187
4.6.3	Perceptions of Selected Dishes by Meal-Occasion	191
4.6.4	Consumer Acceptance of Different Types/Species of Fish and Seafood for Consumption In-Home	199
4.7	Market Segmentation by Consumer Attitudes	206
4.7.1	Introduction	206
4.7.2	Cluster Solution	206
4.7.3	Cluster Demographics	212
4.7.4	Cluster Consumption Characteristics	217
4.7.5	Types/Species Consumed by Cluster	222
4.7.6	Where Fish/Seafood is Purchased by Cluster	226
4.7.7	Meal Preparation for In-Home Consumption by Cluster	228
4.7.8	Types of Fish/Seafood Served In-Home by Cluster	230

4.7.9	Attitudes to Fresh and Frozen Fish When Purchasing - by Cluster	231
4.7.10	Suggested Actions the Fishing Industry Needs to Take to Increase Respondent's Household Fish/Seafood Consumption	234
4.8	Consumer Attitudes to and Trial of Farmed Fish/Seafood	236
4.8.1	Consumer Perceptions/Preferences for Farmed Versus Wild Fish and Seafood	236
4.8.2	Recall and Trial of Farmed Fish and Seafood	239
4.8.3	Trial and Attitudes to Farm Prawns	241
4.8.4	Trial and Attitudes to Rainbow Trout (Freshwater)	244
4.8.5	Trial and Attitudes to Atlantic Salmon (Fresh)	247
4.8.6	Trial and Attitudes to Mussels	251
4.8.7	Trial and Attitudes to Oysters	254
4.8.8	Trial and Attitudes to Farm Barramundi	257
4.9	Under-utilised Wild Species of Fish and Seafood	260
4.9.1	Recall and Trial of Selected Wild Species	260
4.9.2	Trial and Attitudes to Jack Mackerel	262
4.9.3	Trial and Attitudes to Squid/Calamari	265
4.9.4	Trial and Attitudes to Pilchards/Sardines	268
4.9.5	Trial and Attitudes to Australian Herring/Tommy Ruff	272
4.9.6	Trial and Attitudes to Silver Trevally/Skipjack	275
4.10	Recreational Fishing	278
4.10.1	Seasonal Variation	278
4.10.2	Regional Variations in Recreational Fishing	280
4.10.3	Recreational Fish Demographics - Who Fishes?	282
4.10.4	The Recreational Catch - Weight and Species Caught	285
5.	DETAILED FINDINGS - OUT-OF-HOME STUDY	290
5.1	Fish/Seafood Meals Consumed Out-Of-Home	290

5.1.1	Proportion of Respondent Out-Of-Home Meals in which Fish or Seafood was Consumed	290
5.1.2	When Out-Of-Home Meals are Consumed	292
5.1.3	Where Out-Of-Home Fish/Seafood Meals are Purchased/Consumed	296
5.2	Species/Type of Fish or Seafood Eaten Out-of-Home by Occasion	298
5.3	The Type and Method of Preparation of Fish and Seafood by Place of Purchase/Consumption	302
5.4	Consumer Acceptance of Different Types/Species of Fish/Seafood for Consumption Out-Of-Home	310
5.5	Consumer Attitudes to Places of Purchase/Consumption of Fish	314
6.	DETAILED FINDINGS - INSTITUTIONAL CONSUMPTION STUDY	317
6.1	Institutional Respondents - Type, Position and Purchasing Responsibility	317
6.2	Type of Supply - Initial Data	321
6.3	Institutions' Perceptions of Protein Sources	332
6.4	Institutions' Problems in Buying and Preparing Fish and Seafood	340
6.5	Fish and Seafood Purchases - Types, Formats, Origins and Volumes	344
6.6	Stock Selection, Supplier Selection and Supplier Rating	362
6.7	Trends, and Species/Types with Potential for Increased Usage	369
6.8	Institution and Industry Initiatives to Promote Greater Fish and Seafood Consumption	375
6.9	Details of Institutions - Food Expenditure, Staffing, Meals, Capacity	388

APPENDIX I

In-Home Questionnaire

APPENDIX II

Out-Of-Home Self Completion Questionnaire

APPENDIX III

In-Home/Out-Of-Home Sample Design

APPENDIX IV

Institutional Questionnaire

APPENDIX V

List of Species/Types of Fish and Seafood
Comprehensive and Collapsed List

APPENDIX VI

Total Weight to Edible Weight Conversion

APPENDIX VII

Fish and Seafood Consumption Standard Errors

Glossary of Terms Used

Respondent:	the person who provided the information used to complete a questionnaire. For example the main food purchaser and preparer was the respondent in the 'In-Home' questionnaire.
Fish:	see Section 2.4.
Seafood:	see Section 2.4.
Fish/Seafood:	used in the report to mean fish and/or seafood.
Grocery Buyer:	the respondents to the 'In-Home' questionnaire after weighting up.
Non-Grocery buyer:	the respondents to the 'Out-Of-Home Self Completion' questionnaire after weighting up.
Meal-occasions:	a dinner, lunch, breakfast, "other self" or "other person" meal
Other self (meal):	in questioning the respondent to the In-Home questionnaire a meal-occasion other than dinner, lunch or breakfast was termed an "other self" meal-occasions. This accommodated snacks between main meals and the like.

- Other person (meal): in questioning the respondent to the In-Home questionnaire the “other person” meal-occasion was used to accommodate any in-home meals that were consumed by other household members but not by the respondent.
- Meal-type-occasions: at a meal-occasion more than one type of fish/seafood may be consumed. If, for example, two different types of fish/seafood are consumed on one meal-occasion this meal is recorded as two fish/seafood meal-type-occasions. This concept was used in the analysis of In-Home and Out-Of-Home fish/seafood consumption.
- Form bought: (in relation to the ‘In-Home’ questionnaire) refers to the form in which fish or seafood was purchased from the retail outlet or obtained from other sources. See Section 2.4 for details.
- Cooked/prepared/served: (in relation to the ‘In-Home’ questionnaire) refers to the methods employed by household members (usually the respondent) to cook or prepare or serve fish or seafood in the home. For example common methods were grilling, pan frying, as an ingredient and simply served straight (without further preparation or cooking).
- Form of preparation: (in relation to the ‘Out-of-Home’ questionnaire and Section of ‘In-Home’ questionnaire dealing with out-of-home consumption) refers to the form of the fish or seafood just prior to it being used in an out-of-home meal. For example, whole, fillet, cutlet, headed/peeled, smoked, canned and pre-prepared were the forms of preparation used in the questionnaire.

1. Summary

Introduction

In 1990 the Fishing Industry Research and Development Council (FIRDC) commissioned a National Seafood Consumption Study with the main objectives of:

- collecting detailed statistics on fish and seafood consumption in Australia
- determining the attitudes of Australian consumers to fish and seafood
- and, using this data, developing a range of options to enhance the marketing of fish and seafood in Australia.

There had not been a comprehensive study of fish and seafood consumption in Australia since the 1977 PA Consulting Group study conducted on behalf of the Department of Primary Industry¹. Hence an examination of the changes in the Australian fish and seafood market since 1977 was an important aspect of the 1990/91 study.

This report details the results of two major surveys within the 1990/91 National Seafood Consumption Study. The surveys reported upon here are:

- the In and Out-Of-Home consumption survey, which measured the fish and seafood consumption and the attitudes of Australians living in households

¹ “A Report to the Department of Primary Industry on The Consumer Survey of Fish and Seafood Consumption in Australia”, PA Consulting Services Pty Ltd, Melbourne, 1977.

- the Institutional consumption survey which measured the fish and seafood consumption of people in institutions and the attitudes of the caterers who purchase foodstuffs and prepare meals for them.

These two surveys are complementary in their coverage of fish and seafood consumption since together they capture the fish and seafood consumption of virtually all Australians. It is emphasised that the purpose of this report is to present the results of the two surveys in some detail. No conclusions have been presented since these are covered in a separate “Summary and Market Enhancement Options Report”.

Main Findings: *Per Capita* Consumption

The two surveys showed that Australians living in either institutions or households ate an average of 11.99kg² of fish and seafood *per capita* per annum during the survey period in 1990/91. This consisted of 9.29kg of fish and 2.70kg of seafood.

These figures cannot be directly compared to those of the 1977 study³ of fish and seafood consumption since institutional consumption was not included in 1977. However, the 1990/91 study also revealed an average consumption of fish and seafood for just those Australians living in households of 12.06kg *per capita* per annum which can be compared to the 1977 result (Table 1.1) of 10.07kg.

² “A Report to the Department of Primary Industry on The Consumer Survey of Fish and Seafood Consumption in Australia”, PA Consulting Services Pty Ltd, Melbourne, 1977.

³ All references to weight are edible weight unless otherwise specified.

Table 1.1: Annual In and Out-Of-Home Fish and Seafood Consumption of Australians Living in Households: 1977 Versus 1990/91 (kg per capita)

	1977	1990/91	CAGR*
Fish <i>per capita</i>	7.80	9.31	1.4%
Seafood <i>per capita</i>	2.27	2.74	1.5%
Total fish and seafood <i>per capita</i>	10.07	12.06	1.4%

* *Compound Annual Growth Rate.*

This represents an increase of 20% over the 13 years between the studies or a Compound Annual Growth Rate (CAGR) of 1.4%. People living in Perth households had the highest *per capita* consumption of 14.71kg per annum while those from regional Tasmania had the lowest at 10.38kg per annum.

Within the overall increase in consumption lies a shift in the types of fish/seafood consumed in-home and the share of in-home versus out-of-home consumption. In-home consumption of fresh and frozen forms of fish has increased by 1.36kg *per capita* since 1977 though most of this increase has been matched by a decline in the consumption of fish fingers, other frozen packaged, canned and smoked forms of fish as suggested in Table 1.2 Subtotal (1).

Table 1.2: In-Home Fish Consumption 1977 Versus 1990/91 (kgs per capita per annum)

	1977	1990/91
Fresh and frozen	2.90	4.26
Fish fingers	0.66	0.15
Other frozen packaged	0.30	0.22
Canned	1.81	1.39
Smoked	<u>0.24</u>	<u>0.13</u>
Subtotal (1)	5.91	6.15
Cooked fillet	NA*	0.58
Other	<u>0.04*</u>	<u>0.20</u>
Subtotal (2)	0.04*	0.78*
Total In-Home	5.95*	6.94

** does not include the consumption of take-away fish meals eaten in-home because 1977 data did not separate the consumption of this form of fish by whether it was consumed in or out-of-home. Total consumption of take-away fish in and out-of-home in 1977 was 1.10kg per capita per annum.*

As Table 1.2 footnote describes, the 1977 study did not separate fish purchased from take-aways (including fish and chip shops) into consumption in-home or consumption out-of-home. Hence a proper 1977 versus 1990/91 comparison of cooked fillet, which is all purchased from take-aways and "other" forms of fish consumption, that are in part purchased from take-aways is not feasible. However, the main body of the report does include a table of 1990/91 data which has been computer processed to simulate the consumption categories used in 1977. This allows more direct comparison.

Table 1.3: In-Home Seafood Consumption 1977 Versus 1990/91 (kgs per capita per annum)

	1977	1990/91
Fresh and frozen	0.80	0.68
Frozen packaged	0.09	0.06
Canned	<u>0.12</u>	<u>0.05</u>
Subtotal (1)	1.01	0.79
Other	0.02*	0.32
Total In-Home	1.03*	1.11

* does not include in-home consumption of take-away meals since 1977 study did not split consumption of take-away meals by in or out-of-home. In 1977 the consumption of seafood in take-away meals totalled 0.54kg per capita whether consumed in or out-of-home.

Table 1.3 shows in-home consumption of fresh and frozen, frozen packaged and canned forms of seafood to have all declined since 1977 in *per capita* terms.

In sum, only fresh and frozen forms of fish have shown increased *per capita* consumption in-home over the 13 years since 1977. The increase in overall *per capita* consumption can be attributed to increased fish and seafood consumption out-of-home.

Table 1.4 shows that both fish and seafood consumption has risen out-of-home. The extent of the increase is somewhat understated in the figures shown due to the differences in the treatment of take-away meals in 1990/91 versus 1977.

Table 1.4: Out-Of-Home Consumption of Fish and Seafood 1977 Versus 1990/91

	1977	1990/91
Fish:		
Eaten out-of-home	NA	2.38
Cooked from take-away outlets	1.10*	-
Eaten outside the home	0.74	
Total fish out-of-home	1.84*	2.38
Seafood:		
Eaten out-of-Home	NA	1.64
Cooked from take-away outlets	0.54*	
Eaten outside the home	0.70	
Total seafood out-of-home	1.24*	1.64
Total fish and seafood	3.08*	4.02

** an unknown proportion of 1977 consumption of fish and seafood from take-aways. Hence actual 1977 out-of-home fish and seafood consumption was somewhat less than the figures shown.*

Consumption Frequency

The frequency of in-home consumption of all forms of fish and seafood declined from 1977 to 1990/91. Even in the case of fresh and frozen fish which showed an increase in *per capita* weight consumed, actual frequency of consumption declined. *Per capita* consumption was only held up by an increase in the average serve size from 168grms to 218grms.

Table 1.5 summarises the fish/seafood consumption frequency results which illustrate the shift from in-home to out-of-home consumption. The 1977 frequency of eating cooked fish and seafood from take-aways is a mix of in and out-of-home consumption. Even without the contribution of these types of in-home meals (in 1977 figures) the results show a 20% decline in in-home fish consumption frequency and a 11% decline in in-home seafood consumption frequency.

Table 1.5: The Frequency of Fish and Seafood Consumption of Australians Living in Households: 1977 Versus 1990/91 (Meal-Type-Occasions per Week)

	1977	1990/91	
Fish in-home	1.15	0.92	per household
Cooked fish from take-aways*	0.16	NA	per household
Fish eaten out-of-home**	0.13	0.38	per respondent
Seafood in-home	0.18	0.16	per household
Cooked seafood from take-aways*	0.06	NA	per household
Seafood eaten out-of-home**	0.13	0.24	per respondent

* in the 1977 study this type of fish/seafood meal was not split by whether it was consumed in or out-of-home

** the consumption out-of-home of all Australians over 15 years of age.

Table 1.5 highlights the greater popularity of seafood consumed out-of-home versus in-home. On the other hand, fish is consumed far more often in-home than out-of-home.

Also derived from 1990/91 frequency of consumption results, the proportion of Australian households that had consumed any form of fish or seafood in-home in the seven days prior to interview was 55.2% and 11.4% respectively. By far the most popular forms of fish consumed were fresh and canned fish consumed in the past seven days by 25.4% and 22.3% of households respectively.

The most popular forms of seafood consumed in-home were fresh and “other” (ie cooked, used as ingredient in pizza and Chinese take-away meals) consumed in the past seven days by 5.3% and 4.6% of households respectively.

Out-of-home consumption frequency was surveyed for the main food purchaser/preparer in each household (termed the grocery buyer for convenience) and all other members of each household over the age of 15 years (termed non-grocery buyers).

Table 1.6: The Frequency of Fish and Seafood Consumption Out-Of-Home: Grocery and Non-Grocery Buyers

	Fish out-of-home		Seafood out-of-home	
	Grocery buyers	Non grocery buyers	Grocery buyers	Non grocery buyers
Proportion eating fish/seafood out-of-home in last week	16.4%	20.6%	13.4%	18.2%
Average number of times fish/seafood eaten out-of-home per week	0.279	0.456	0.209	0.263

Non-grocery buyers were more frequent consumers of fish/seafood out-of-home than grocery buyers (Table 1.6).

The most popular places of purchase/consumption of fish and seafood for out-of-home meals were restaurants, friends’ and relatives’ houses, fish and chip shops and “other” places (“other” places were generally canned fish used in sandwiches that were prepared at home and eaten at work).

When Fish/Seafood Meals Were Consumed and Species and Forms Consumed

The study shows a distinct preference for consuming fish/seafood meals at the evening meal and on Fridays (whether consuming in or out-of-home). 9.2% of in-home meals were fish/seafood meals on Friday versus only 4.6% on Sunday. Saturday was also a popular day for out-of-home fish and seafood meals.

66.4% of in-home fish/seafood meals and 51.3% of out-of-home fish/seafood meals were consumed at dinners.

The most popular forms of fish consumed in-home were canned fish (32.5% of all in-home fish meal-type-occasions) and fresh fillets (25.6%). Canned fish constituted over two thirds of all lunchtime fish meal-type-occasions in-home while fresh fillets were more popular than canned fish at dinner time.

Nonetheless, there has been a shift to consuming canned fish at dinners rather than lunches over the years 1977 to 1990/91. In 1977 only 29.1% of all canned fish meals were consumed at dinner and 61.3% at lunch. In 1990/91 37.5% were at dinner and 52.5% were at lunch.

35.3% of all seafood in-home meal-type-occasions consisted of seafood bought in fresh whole form and 33.5% in "other" (ie pre-cooked, crumbed, used as ingredient in pizza and Chinese take-away meals, etc). A higher proportion of in-home seafood meals were consumed at dinner time (71.9%) than was the case for fish meals (65.4%).

The orange roughy/perch species was the most commonly consumed fresh/frozen fish in-home in Australia in 1990/91. It was also one of the most popular fish species consumed out-of-home, particularly at restaurants. This species was unknown in 1977 and has gained rapid consumer acceptance since its introduction into the market place. Shark is another very popular fish species purchased fresh/frozen for in-home consumption that was relatively unknown in 1977. The 1977 study recorded flake (another term for shark) as the most popular species purchased as a cooked fillet from take-aways/fish and chip shops. In 1990/91 the term flake had completely dropped out of use and shark had an even greater share of cooked fillet purchases from take-away/fish and chip shops.

Place of Fish/Seafood Purchase

The place of purchase of fish and seafood for in-home consumption showed strong dependence upon the form of fish or seafood. For example, for the various main forms of fish consumed in-home:

- fresh fish and seafood was most commonly purchased from specialist retail fish shops, fish or general markets or caught by a household member or friend
- frozen fish was most commonly purchased from supermarkets while frozen seafood was purchased mainly from the same outlets as fresh seafood
- most frozen packaged (ready to cook), canned and smoked fish and seafood were purchased from supermarkets
- pre-cooked fish fillets were predominantly purchased at fish and chip shops/take-aways as was much of the “other” forms of seafood which include seafood used as an ingredient in take-away meals, cooked seafood and crumbed seafood.

Supermarkets’ relative share of all in-home fish and seafood meals have actually declined since 1977 due to the substantial fall in the consumption of fish fingers, frozen packaged (ready to cook) and canned fish and seafood products.

However, while supermarkets have maintained their dominant share of these (overall) declining market segments, they have also increased their previously insignificant share of fresh and frozen fish and seafood in-home meals. For example in 1977, 7.3% of fresh and frozen fish meals were purchased from supermarkets; in 1990/91 this had increased to 16.7%. Equivalent figures for fresh and frozen seafood are 3.7% in 1977 to 8.5% in 1990/91. There has been a consequent decline in the share of specialist retail fish shops in fresh and frozen fish and seafood meals, though specialist retail fish shops still had the largest share in 1990/91.

The forms of fish and seafood consumed out-of-home also show strong dependence upon the place of purchase/consumption. Of all fish/seafood out-of-home meals, fillets were the most popular with a 29% of out-of-home meal-type-occasions, followed by canned (16%), whole (15%) and pre-prepared (13%). However, the forms most popular in the various places of purchase/consumption were:

- canned fish/seafood took a 40% share of fish/seafood meals at work cafeterias
- fillets and whole fish/seafood took a 23% and 22% share respectively of restaurant fish/seafood meals
- fillets took a 41% share of fish/seafood meals at clubs and hotels and a 68% share at fish and chip shops
- fillets and pre-prepared fish and seafood took 29% and 25% of meals purchased/consumed at fast food outlets/take-aways
- canned fish/seafood took a dominant 69% of fish/seafood meals purchased/consumed at sandwich/milk bars and 58% at “other” places of purchase/consumption which were often at the place of work.

Based upon these results, canned fish/seafood meals out-of-home were mostly in sandwiches, whether prepared in the home for later consumption out-of-home, or purchased from work cafeterias, coffee lounges/cafés or sandwich/milk bars.

These four places of purchase/consumption together account for 21.8% of all out-of-home fish/seafood meals. Restaurants have the largest share of out-of-home fish/seafood meal-type-occasions at 35.4%, while consumption at friends' and relatives' houses accounts for 15.5%.

Restaurants were pre-eminent in the purchase/consumption of seafood - over half restaurant meal-type-occasions were seafood, while for all other places of purchase/consumption the seafood proportion fell between 13% and 38%.

Respondents were polled on the factors that led them to order fish/seafood from a menu at either a restaurant, club, hotel, fish and chip shop or fast food/take-away outlet. The top three factors mentioned for all outlets were the same:

- clean premises
- fresh fish/seafood rather than frozen is used, and
- the place has a reputation for quality fish/seafood.

Fish and Seafood Preparation

The preparation of fresh and frozen fish in-home has shifted since 1977 from frying to grilling. In 1977, 59.8% of in-home fresh and frozen fish meals were fried and 13.2% grilled. In 1990/91 the proportions were 43.2% and 23.0% respectively.

There has also been a shift away from using canned fish "straight" to its use as an ingredient in more elaborate dishes such as mornays, casseroles, and stir fry.

43.5% of fresh and frozen seafood was served straight in 1977. This proportion had declined to 18.5% in 1990/91. Instead, 21% of fresh and frozen seafood meal-type-occasions were prepared using seafood as an ingredient in mornays, stir fry, casseroles and other dishes. A similar shift in favoured preparation methods for canned seafood has also occurred.

It is likely that recipes have played a role in the swing to the use of canned fish and seafood as ingredients. Meals prepared using canned fish showed the highest recipe usage rate amongst all forms of fish.

Deep frying was the most common method of cooking/preparing fish/seafood consumed out-of-home, accounting for 24% of all fish/seafood out-of-home meal-type-occasions. Straight and grilling were the second and third most common methods respectively. No comparative figures were available from the 1977 study.

Attitudes to Retail Outlets, Fish in General and Underutilised Wild and Farmed Species

Fish or general markets, specialist retail fish shops, fish and chip shops/take-aways and supermarket foodstores were the four main outlets for fish and seafood consumed in-home, accounting for 80% of all in-home meal-type-occasions. Those respondents who had consumed fresh or frozen fish/seafood within the previous seven days purchased from either of these outlets, were asked to rank 16 factors by their importance to their selection of an outlet from which to purchase fish/seafood.

Consumer concern over store cleanliness and reputation for quality fish/seafood were consistently the highest ranked factors across all four outlet types. Beyond this the factors considered important for supermarkets/foodstores had a different slant to those for the other three outlet types.

Two of the four most important ranked factors relating to the three outlet types other than supermarkets/food stores relate to retailer reputation and consumer confidence that fish/seafood sold as fresh is, in fact, fresh. It is apparent that consumers still have concerns over the quality of fish/seafood they buy and the integrity of fresh fish/seafood retailers in particular. The equivalent ranked factors for supermarket/food stores were easy store access and friendly staff. For all outlets the factors that were consistently ranked as low in terms of their importance to the respondents' choice of outlet were:

- has considerably low prices for fish/seafood
- offers fish/seafood specials
- offers advertised specials regularly.

These rankings would suggest that those consumers who had eaten fresh or frozen fish/seafood in the previous seven days were more concerned with the quality of the fish/seafood (particularly fresh fish/seafood freshness) than they were with price.

In another battery of consumer attitude tests, concerns over the integrity and reliability of the labelling on fresh or frozen fish were highly evident. Many consumers would only consider the purchase of certain well known species of fish and fish that had white or light coloured flesh that had been cut and filleted. Given the seasonal availability of many fish species, the strong consumer preference for certain species and type of fish is a barrier to fish becoming a more regular meal in the home in the same way that red meat and poultry now is.

Respondents were also asked what type of food they would have purchased if the fish/seafood they had bought in the previous week had not been available. Half of the respondents said they would have opted for another type of food rather than another type of fish/seafood. This again indicates the strong preferences that many consumers have for certain species of fish/seafood often to the exclusion of others.

This general attitude has the potential to reduce the market acceptance of less well known species. A section of the survey sought specific information on consumer awareness, trial and attitude to a selected range of underutilised wild and farmed species. Farmed oysters, rainbow trout and mussels were well known and had been tried by most respondents. On the other hand, farmed Atlantic salmon, barramundi and prawns were less well known and had been tried by less than one fifth of respondents. Most of the problem appears to be the relative recent entry of these farmed products into the Australian market and the still limited distribution. Highly positive to increased consumption of these newer products were the responses of people who had tried them - all were well liked.

Of the five underutilised wild species, squid/calamari was the best known and had the highest trial rate. At the other end of the scale, Jack mackerel was only known of by 20% of respondents and had been tried by just 5%. However, 70% of those who had tried it reported either slightly liking it or liking it very much. As for some of the newer farmed species, low consumer knowledge and trial rates appeared to be largely due to regional differences in the availability of Jack mackerel.

Market Segmentation

Based upon another more detailed attitude test within the in-home questionnaire, consumers were grouped into seven "clusters" of consumers of like attitude using a technique called cluster analysis. This analysis was able to establish a strong link between consumer attitude and behaviour. It showed that the two clusters with most positive attitudes to fish/seafood had over two times the *per capita* fish/seafood consumption both in and out-of-home compared to clusters that had the most negative attitudes to fish/seafood. This information will allow targeted marketing strategies to be developed.

Recreational Fishing Activity

One third of Australian households contained at least one member who was involved in recreational fishing in the three months January, February and March 1991 which represented the peak season in terms of recreational fishing activity and catch. This is the same proportion as the 1977 PA study reported.

The low season in recreational fishing activity occurred in the winter months of July, August and September 1991 when 23% of households had at least one member involved in recreational fishing.

The catch from recreational fishing, estimated at 24,392,000kg live weight per annum in the areas surveyed, represents 2.82kg edible weight of fish and seafood *per capita* or 23% of the 12.06kg total in and out-of-home fish/seafood consumption of Australians living in households. These figures show recreational fishing to be a major contributor to fish and seafood consumption in Australia.

In general, households in regional areas were more likely to be involved in recreational fishing than those in the cities. Regional South Australia, regional Western Australia and regional Tasmania had the highest levels of recreational fishing involvement. Canberra and Perth were the two cities with highest involvement which was also the case in the 1977 PA study.

Institutional Consumption and Purchasing Patterns

The fish and seafood consumption of people living in institutions was 8.28kg and 0.53kg respectively, or 8.81kg of fish and seafood in total. Hence, the *per capita* fish consumption of people in institutions was slightly below that of people living in households. Seafood *per capita* consumption of people in institutions was one fifth of that of people living in households.

The major forms of fish purchased and consumed in institutions were frozen fish (namely fillets) and canned fish which accounted for 77.5% of the edible weight of all fish consumed in institutions. Frozen seafood accounted for 83.0% of the edible weight of all seafood consumed in institutions. Across the different types of institutions surveyed, *per capita* fish and seafood consumption varied considerably. Prisons/youth centres and secondly hospitals/nursing homes showed highest *per capita* fish/seafood consumption at 9.92kg and 9.52kg respectively. Interestingly, prison/youth centre consumption was all fish - no seafood was reported as being purchased by any prison surveyed.

Welfare/charitable homes reported the lowest *per capita* fish/seafood consumption of 6.17kg per person. As for prisons, all but 0.01kg of this was fish rather than seafood.

Apart from the consumption of fish and seafood in institutions, the survey sought to identify purchasing patterns and considerations of the buyers for institutions, in the same way that this information was also sought in other “trade” segments of the study⁴. The following major points emerged for institutions as compared to other “trade” segments surveyed⁵:

- there is a far greater variety of potential decision-makers in institutions regarding the purchasing of fish and seafood
- institutions most frequently select meals on a regular menu basis. If their fish consumption is to increase, then this manual selection process must be influenced, and its subsequent constraints complied with (ie agreed price, guaranteed availability, reliability of quality)

⁴ Fishing Industry Research and Development Council, “Trade Supplies for the Public for In-Home Consumption” (Retailers, Fishmongers, Wholesalers and Warehouse Withdrawals Data) Report, July 1992, PA Consulting Group, Perth, Western Australia, for example.

⁵ Other trade segments surveyed were 1) Retailers, Fishmongers, Wholesalers and Warehouse Withdrawals Data, and 2) Caterers, ‘Restaurants’ and ‘Take-Aways’ which are analysed in two separate reports.

- institutions were unique amongst the trade segments in their commitment to canned products. Canned tuna and salmon were by far the most frequently purchased non-fresh/frozen finfish items
- institutions were unique amongst the trade segments in their emphasis on cleanliness as a priority issue when selecting a supplier
- institutions displayed a unique conservatism amongst the trade segments regarding their outlook for the future of the fishing industry. Whilst all other trade segments anticipated increased fish and seafood sales over the coming 5 - 10 years, most institutional respondents predicted that sales would remain the same
- the tendering process for establishing fish purchase contracts is used by as little as 26% of institutions, and accordingly presents no real barrier to enhanced sales into this sector
- the primary levers which could be used by fish and seafood suppliers would be quality and price. Institutions have positive perceptions of the healthiness of fish and seafood in diets (ahead of poultry and meat as alternative protein sources). Their chief negative perceptions relate to price levels, price fluctuations and freshness of product. By and large though, as a group, institutions tend to see no major problems in the handling and preparation of fish and seafood
- the fish preference pattern for institutions most closely resembles that of 'take-aways' (particularly fish and chip shops) and caterers. It emphasises fillets of hake, orange roughy, whiting, shark and blue grenadier as popular species, principally because of customer demand, ease of eating (boneless, skinless) and value for money
- institutions noted a trend towards health-consciousness and reduced intake of saturated fats and oils, in keeping with other trade segments

- in considering initiatives to expand their proportion of expenditure on fish and seafood, institutions most frequently considered that this would neither be achieved through their own efforts or the efforts of the fishing industry.

2. Summary of Methodology

2.1 Overview of Methodology

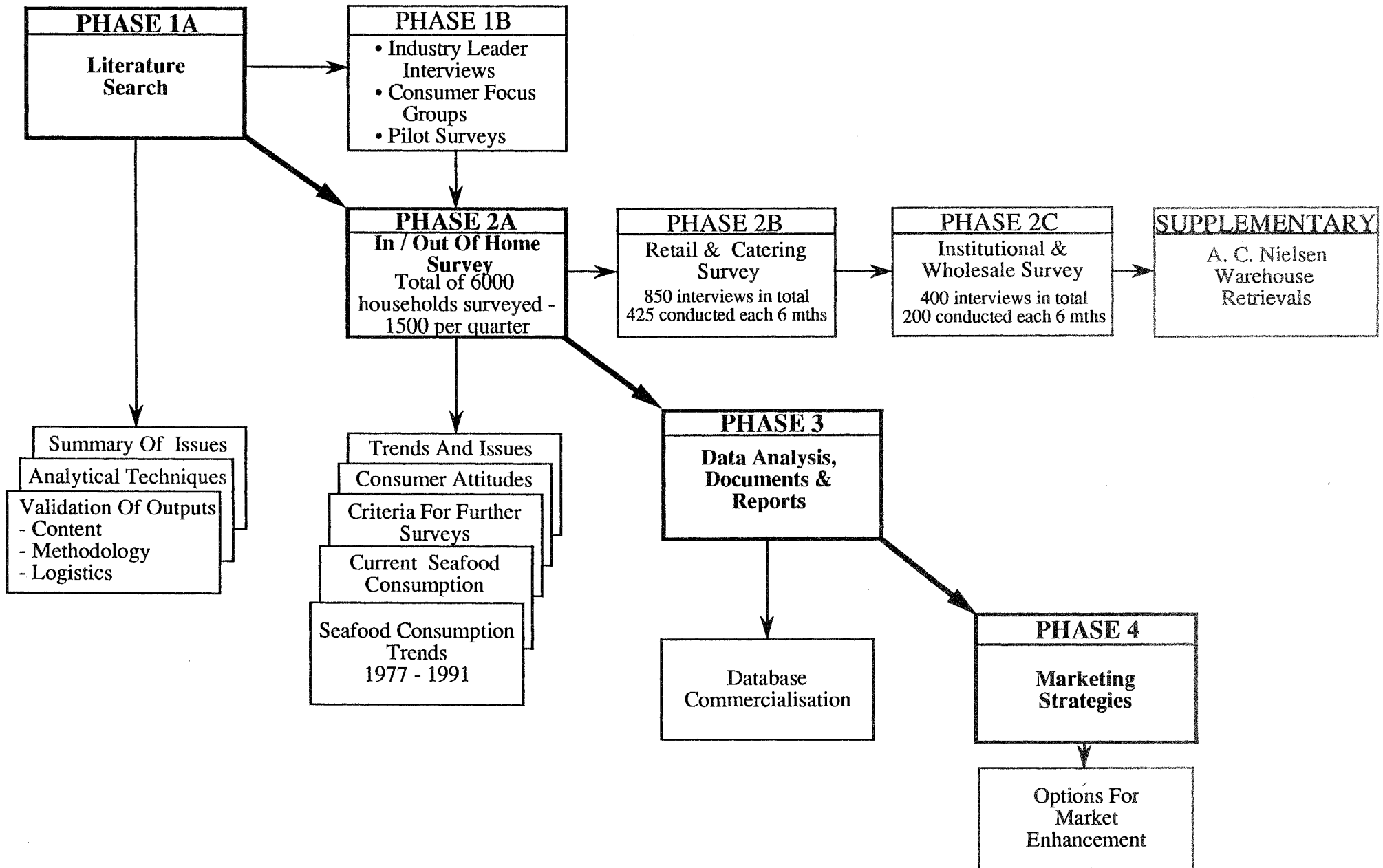
The Fishing Industry Research and Development Council (FIRDC) is responsible for the funding and administration of Australian fisheries R&D, in order to improve the efficiency and effectiveness of resource application.

In 1990 the FIRDC commissioned a National Seafood Consumption Study to be conducted by a consortium comprising PA Consulting Group (management and technology consultants), Yann Campbell Hoare Wheeler (YCHW; consumer and market research consultants) and Ruello & Associates (specialist fishing industry consultants).

The objectives of the study were:

- to collect detailed and meaningful statistics pertaining to present fish and seafood consumption within Australia from the retail sector, the institutional sector and all other areas
- to collect detailed statistics upon consumer attitudes to fish and seafood both in the short and long term
- to determine from these statistics and survey techniques the nature of the Australian fish and seafood market today, and how this market might be improved both in terms of utilised and under-utilised species.

Figure 2.1.1: Project Scope – Activities And Outputs



The consortium adopted a phased approach for the conduct of the study, shown in the schematic of Figure 2.1.1. Each phase is briefly outlined below:

– Phase 1 (A and B): Information Needs Analysis and Pilot Testing

This phase ensured that the questions asked of the public and the trade in Phase 2 of the study were of relevance and value to industry.

In this phase the questionnaires were developed and pilot tested prior to running the full surveys in Phase 2 (A, B and C).

– Phase 2 (A, B, C and Supplementary): Conduct of the Surveys

As shown in Figure 2.1.1 several surveys were carried out concurrently. The Phase 2A 'In-Home and Out-Of-Home Consumption' questionnaire was focussed on the end consumer of fish and seafood. The sampling methodology of this survey was crafted to ensure compatibility with the previous national study conducted in 1977 by PA Consulting Group on behalf of the Department of Primary Industry⁶.

The distribution of fish and seafood to general consumers and institutional consumers was surveyed in Phases 2B, 2C and the supplementary data.

– Phase 3: Data Analysis, Documentation and Reports

This phase centred around analysis of results and their documentation. Of particular importance was an examination of major trends 1977 versus 1990/91 and both consumer and trade attitudes to fish and seafood.

⁶ "A Report to the Department of Primary Industry on The Consumer Survey of Fish and Seafood Consumption in Australia", PA Consulting Services Pty Ltd, Melbourne, 1977.

– Phase 4: Marketing Strategies

The major issues and trends derived from the Phase 3 analysis was drawn upon to develop a series of strategies aimed at enhancing the Australian fish and seafood market.

This report covers:

- the consumption of fish and seafood by the consumer both in and out-of-home (Phase 2A)
- the purchase of fish and seafood by institutions and subsequent consumption of fish and seafood in institutions (a part of Phase 2C).

Hence, the consumption data discussed in this report represents the sum total of all fish and seafood consumption in Australia (with the exception of the Northern Territory).

The last Australia-wide fish and seafood consumption study, conducted in 1977 by PA Consulting services on behalf of the Department of Primary Industry, covered only fish and seafood consumption in and out-of-home. Where applicable, comparisons between the 1977 study and the current study are drawn.

A far larger component of the current study was concerned with consumer attitudes which were not dealt with in 1977.

Specific details of the survey methodology are given in the sections that follow.

2.2 In-Home and Out-of-Home Consumption Study Methodology

2.2.1 The In-Home and Out-Of-Home Questionnaires

Two questionnaires were used in this study phase:

- ‘In-Home’ questionnaire
- ‘Out-Of-Home’ questionnaire.

Copies of each questionnaire are given in Appendix I and II respectively. The two questionnaires are complementary in terms of their coverage of fish/seafood consumption. Details of the sampling techniques including the regions sampled are given in Appendix III.

The ‘In-Home’ questionnaire was administered through personal interviews to 6,000 people who were the main food purchaser and preparer in their household. Only one person per household was interviewed. In this report these people are referred to as “respondents” along with people who answered other questionnaires. This terminology is defined further in the Glossary of Terms. The fish and seafood consumption this questionnaire measured was:

- the consumption in-home of all members of the household and visitors to the household in the seven days immediately prior to the interview
- the out-of-home consumption of the respondents for those same seven days
- the out-of-home consumption of children, under 15 years of age when the fish/seafood had been purchased by the respondent, again over the last seven days.

Hence, the 'In-Home' questionnaire accounted for all in-home fish/seafood consumption and a part of out-of-home fish/seafood consumption. The 'Out-Of-Home' questionnaire was designed to measure the remaining out-of-home fish/seafood consumption.

Specifically in three out of ten households in which the 'In-Home' questionnaire was completed, the supplementary 'Out-Of-Home Self Completion' questionnaire was left with all other household members 15 years of age or more. This methodology was the same as that in the 1977 study. For the sake of clarity, these household members will be termed "non-grocery buyers" while the main food purchasers and preparers will be termed "grocery buyers" (see Glossary of Terms).

The non-grocery buyers were asked to fill out the 'Out-Of-Home Self Completion' questionnaire and return it in the attached return paid envelope.

Fish and seafood consumption measured by this questionnaire was:

- the out-of-home consumption of non-grocery buyers over the seven days prior to them receiving the questionnaire
- the out-of-home consumption of children under 15 years of age when the fish/seafood had been purchased by the non-grocery buyer, over those same seven days.

In total, 2,159 'Out-Of-Home' questionnaires were placed with other household members aged 15 years or more and 507 were returned. This equates to a response rate of 23% which is in line with that predicted by academic literature of 15% to 25% for the survey methodology used.

The 6,000 'In-Home' interviews were divided equally over four quarters - 1,500 interviews conducted per quarter. This was done to capture any seasonal variation in consumption and eating patterns. By association the 'Out-Of-Home Self Completion' questionnaires were also distributed across four quarters.

The fieldwork for the In-Home Study followed the timetable below:

First Quarter	3 November	-	27 November, 1990
Second Quarter	16 February	-	17 March, 1991
Third Quarter	18 May	-	16 June, 1991
Fourth Quarter	17 August	-	15 September, 1991

Apart from collecting statistical information on fish and seafood consumption, both questionnaires were designed to collect detailed statistics on consumer attitudes to fish and seafood. Questions were asked to determine attitudes to:

- substitutes to fish and seafood by meal-occasion
- fish and seafood by meal-occasion
- retail outlets
- the purchase of fresh and frozen fish
- selection of restaurants on the basis of reputation for fish and seafood
- outlets for out-of-home fish and seafood meals
- under-utilised wild species and farmed species
- different types of fish and seafood.

Statistical information on recreational fishing was also obtained.

2.2.2 Weighting Procedures - In-Home and Out-Of-Home Sample

The data from the 6,000 In-Home interviews was weighted up to represent a total of 5,221,710 households in the seven capital cities and six regional areas that were surveyed.

The basis of the weighting up was household composition. This was determined during the In-Home interview as one of the categories given in the right hand column of Table 2.2.2.1.

Table 2.2.2.1: Household Composition Categories Used in the In-Home Consumption Study and ABS* Equivalents

ABS*	In-Home Consumption Study
Lone person household	Single/living alone
Group household/related adults	Single/living with other singles - relatives/not relatives
Couple	Married/de facto, no child(ren)
Couple, dependent child(ren)	Married/de facto, dependent child(ren)
Couple and adult family members Couple, child and adult family members	Married/de facto, adult family members
Parent, dependent child(ren) Parent, dependent children and adult family members	Single parent/dependent child(ren) Single parent/adult family members

* Australian Bureau of Statistics.

The Australian Bureau of Statistics (ABS) 1986 Census of Population and Housing provided the base household composition information to which the 6,000 household sample was weighted up to. Table 2.2.2.1 shows how the household composition classifications used in the In-Home questionnaire were matched to ABS classifications. Table 2.2.2.2 shows the numbers actually sampled versus the numbers of households given by the ABS Census to which the sample was weighted up to.

Table 2.2.2.2: In-Home Study Sample Size and Weighted Up Numbers of Households by City or Region

City or Region	In-Home Study Sample (No. of households)	ABS Census (No. of households)
Sydney	1,150	1,145,396
Regional New South Wales	570	687,246
Melbourne	1,030	960,556
Regional Victoria	360	395,679
Brisbane	520	387,872
Regional Queensland	360	473,9421
Adelaide	520	350,383
Regional South Australia	150	125,605
Perth	460	342,688
Regional Western Australia	150	124,576
Canberra	330	79,314
Hobart	250	60,734
Regional Tasmania	150	88,720
Total	6,000	5,221,710

The number of people within these households total 14,571,000 to the nearest thousand. This is the figure used in calculating the *per capita* consumption of people living in households.

The information also formed the basis in the determination of the number of people (weighting factor) in the Out-Of-Home Consumption Study. The 507 non-grocery buyers who returned the 'Out-Of-Home Self Completion' questionnaire were scaled up to represent the 6,754,000 non-grocery buyers amongst the 14,571,000 (weighted) sample population.

2.2.3 Sample Characteristics - In-Home and Out-Of-Home Sample

Table 2.2.3.1 provides details of the 'In-Home' questionnaire sample quarter and 'Out-Of-Home Self Completion' questionnaire sample across all four quarters. The figures shown reflect the sample after the weighting procedure has been applied as discussed in Section 2.2.2. Hence the figures in Table 2.2.3.1 relating to Region and Household Composition show little or no variation by quarter, as would be expected since these sample characteristics have been weighted to reflect those of the ABS 1986 Census of Population and Housing.

Table 2.2.3.2 provides a breakdown of the 'In-Home' questionnaire sample by region, again after weighting up has been done. Hence the variation in household composition by region reflects that of the ABS 1986 Census of Population and Housing. Households consisting only of adults comprised 68.7% of the sample which is up considerably on the 56% figure from the 1977 study.

Overall, 26.5% of the sample were over 60 years of age, which is considerably higher than the 20.8% in the 1977 study. The 40 - 59 year age group has remained at about 34% as in 1977. The 20 - 39 year age group has declined as a proportion of respondents from 43.3% in 1977 to 38.1% in 1990/91. These figures are consistent with ABS figures which show that the Australian population has aged over the last 15 years or so.⁷

80% of households' main food purchasers and preparers were female and 20% male.

Variations in sample demographics by region are evident in Table 2.2.3.2. Sydney households' characteristics were very similar to the sample average though Sydney respondents were more likely to refuse to provide details of their incomes than most other cities/regions.

Generally, a higher proportion of regional households consisted of a couple with dependent children, compared to households in the adjacent city. For example, 28.5% of regional New South Wales households consisted of married/de facto couples with children compared to 25.8% in Sydney.

The main household food purchaser and preparer (grocery buyer) was generally older in regional areas compared to their city counterparts. The only exception to this was regional Western Australia where 53.3% of grocery buyers were under 40 years of age versus 36.2% in Perth.

The household gross income figures suggest that incomes of city households are, on average, higher than their regional counterparts. For example, 27.2% of regional New South Wales households in the sample had a gross income of less than \$15,000 versus only 13.7% of Sydney households.

⁷ As a proportion of the total Australian population, the over 35 year old age group has increased from 40.4% to 45.4% over the period June 1977 to June 1990, ABS Catalogue No. 3201.0.

Some caution must be exercised in interpreting these figures as many respondents did not know or did not wish to divulge their household incomes. However, ABS figures also show capital cities' households as having significantly higher than average household incomes than their rural counterparts.⁸

The figures also suggest that Canberra households have, on average, higher gross incomes than any other city or region surveyed. This is consistent with ABS data for the capital cities which shows the ACT as having the highest average weekly household income in 1988 - 89⁹.

These sample characteristics will be further discussed later in the report in terms of their possible effects upon fish and seafood consumption in the cities and regions surveyed.

Ethnic background was another factor expected to play a role in determining fish and seafood consumption. Hence respondents, if they had emigrated to Australia after their fifth birthday, were asked to detail their country of birth. Table 2.2.3.3 provides the results of this question. This data will also be referenced later in the report.

⁸ Corrigendum "1988 - 1989 Household Expenditure Survey, Australia States and Territories" ABS Catalogue 6533.0, p.32.

⁹ Corrigendum "1988 - 1989 Household Expenditure Survey, Australia States and Territories" ABS Catalogue 6533.0, p.32.

Table 2.2.3.1: In-Home/Out-Of-Home Study Sample by Quarter: Proportion of Total Sample

		In and Out-of-Home Consumption of Main Food Purchaser/Preparer					Out-of-home Consumption
		Nov 1990 (%)	Mar 1991 (%)	June 1991 (%)	Sept 1991 (%)	Total (%)	Non-grocery buyers (%)
Region	Sydney	21.9	21.9	21.9	21.9	21.9	19.0
	Regional NSW	13.2	13.2	13.2	13.2	13.2	14.0
	Melbourne	18.4	18.4	18.4	18.4	18.4	16.0
	Regional Vic	7.6	7.6	7.6	7.6	7.6	7.0
	Brisbane	7.4	7.4	7.4	7.4	7.4	7.0
	Regional Qld	9.1	9.1	9.1	9.1	9.1	7.0
	Adelaide	6.7	6.7	6.7	6.7	6.7	8.0
	Regional SA	2.4	2.4	2.4	2.4	2.4	2.0
	Perth	6.6	6.6	6.6	6.6	6.6	9.0
	Regional WA	2.4	2.4	2.4	2.4	2.4	2.0
	Canberra	1.5	1.5	1.5	1.5	1.5	3.0
	Hobart	1.2	1.2	1.2	1.2	1.2	5.0
	Regional Tas	1.7	1.7	1.7	1.7	1.7	1.0
Area	Coastal Area	83.8	83.8	86.5	84.2	84.7	87.0
	Inland Area	16.2	16.2	13.5	15.9	15.3	13.0
Respondent Sex	Male	20.3	19.4	19.3	20.7	20.0	72.0
	Female	79.7	80.6	80.7	79.3	80.0	28.0
Age Group	Under 40 years	40.5	39.7	38.3	39.6	39.5	60.0
	40 - 59 years	34.4	34.4	33.6	32.6	33.9	25.0
	Over 60 years	25.0	25.8	28.1	27.3	26.5	15.0

cont...

		In and Out-of-Home Consumption of Main Food Purchaser/Preparer					Out-of-home Consumption
		Nov 1990 (%)	Mar 1991 (%)	June 1991 (%)	Sept 1991 (%)	Total (%)	Non-grocery buyers (%)
Household Composition	Single/living alone	18.8	18.8	18.8	18.8	18.8	0.0
	Single with other singles	9.0	9.0	9.0	9.0	9.0	6.0
	Married/de facto no children	23.3	23.3	23.3	23.3	23.3	25.0
	Married/de facto with children	27.7	27.7	27.7	27.7	27.7	49.0
	Married/de facto with adult family members	15.7	15.7	15.7	15.7	15.7	13.0
	Single parent with children	3.3	3.6	3.9	3.9	3.6	3.0
	Single parent with adult family members	2.2	2.0	1.7	1.7	1.9	3.0
Socio-Economic Group	Upper/upper middle	18.4	15.8	15.9	17.4	16.9	24.0
	Middle	18.6	18.9	20.0	16.8	18.6	26.0
	Lower middle	19.3	16.9	16.8	16.6	17.6	20.0
	Lower	20.2	18.9	17.1	17.4	18.3	26.0
	Retired white collar	6.8	9.0	10.7	10.5	9.1	1.0
	Retired blue collar	7.8	11.7	10.8	12.1	10.7	0.0
	Not determined	8.9	8.8	8.7	9.1	8.9	3.0
Household Income	Less than \$15,000	18.6	20.2	19.5	19.9	19.5	11.0
	\$15,000 - \$25,000	12.7	15.5	14.2	13.4	13.9	14.0
	\$25,001 - \$40,000	20.7	20.2	19.6	22.4	20.7	27.0
	\$40,001 - \$60,000	14.6	12.4	14.8	14.2	14.2	19.0
	More than \$60,000	10.4	9.9	9.5	9.6	9.9	13.0
	Refused/don't know	22.9	21.7	22.5	20.5	21.5	16.0

Table 2.2.3.2: Variations in the Sample by Region: Main Food Purchaser/Preparer (Grocery Buyers)

		Total	Syd	Reg NSW	Melb	Reg Vic	Bris	Reg Qld	Adel	Reg SA	Per	Reg WA	Canb	Hob	Reg Tas
		%	%	%	%	%	%	%	%	%	%	%	%	%	%
Household Composition	Single/living alone	18.8	19.8	18.4	19.2	18.8	18.5	17.2	20.3	18.3	18.6	15.3	15.2	20.0	17.8
	Single with other singles	9.0	10.5	7.6	9.5	6.8	10.0	8.5	9.0	6.2	9.3	6.5	9.5	7.3	8.4
	Married/de facto no children	23.3	21.9	24.8	21.8	24.3	22.4	26.0	24.8	26.2	23.1	24.2	20.3	23.4	23.9
	Married/de facto with children	27.7	25.8	28.5	27.4	30.4	27.3	28.4	24.8	30.2	27.0	33.8	35.4	27.6	28.8
	Married/de facto with adult family members	15.7	16.6	14.9	17.1	14.6	15.9	14.4	15.4	14.3	15.4	14.5	12.7	15.0	15.5
	Single parent with children	3.6	3.8	3.2	2.9	3.1	4.1	4.0	4.1	3.0	4.1	4.5	4.6	4.9	3.7
	Single parent with adult family members	1.9	1.6	2.7	2.1	2.0	1.9	1.5	1.6	1.8	2.5	1.1	2.3	1.8	1.8
Age Group	15 - 19 years	1.4	2.0	0.7	1.3	1.2	1.0	0.7	1.7	2.6	1.0	2.1	4.7	2.7	2.0
	20 - 39 years	38.1	38.6	34.2	41.2	39.9	39.4	36.8	32.9	36.8	35.2	51.2	46.9	35.6	30.8
	40 - 59 years	33.9	34.1	29.9	36.6	30.3	36.4	31.0	34.9	26.4	40.4	29.4	35.9	34.5	38.1
	Over 60 years	26.5	25.2	35.2	20.7	28.1	23.2	31.5	30.5	34.2	23.3	17.3	12.5	27.2	29.1
	Refused/no answer	0.1	0.1	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0
Sex of Respondent	Male	20.0	23.5	15.5	21.0	14.4	22.0	22.3	18.6	17.5	20.4	15.0	29.2	17.6	10.7
	Female	80.0	76.5	84.5	79.0	85.6	78.0	77.7	81.4	82.5	79.6	85.0	70.8	82.4	89.3
Household Income	Less than \$15,000	19.5	13.7	27.2	13.5	22.4	21.0	26.3	22.1	31.8	19.2	13.8	7.7	24.0	31.6
	\$15,000 - \$25,000	13.9	11.9	15.2	9.0	18.5	17.1	17.7	14.2	12.7	17.2	17.1	8.9	11.3	20.8
	\$25,001 - \$40,000	20.7	18.4	18.7	21.8	20.0	24.1	23.0	18.5	18.6	24.1	28.5	25.2	20.4	15.5
	\$40,001 - \$60,000	14.2	16.8	11.8	16.9	10.0	10.8	10.8	17.1	10.3	14.4	12.8	19.5	15.8	10.4
	More than \$60,000	9.9	13.5	5.7	14.4	3.3	9.3	7.0	6.7	1.7	12.7	9.0	19.4	7.1	4.9
	Refused/dont' know/no answer	21.7	25.8	21.4	24.4	25.7	17.7	15.2	21.4	24.8	12.4	18.9	19.3	21.4	16.8

Table 2.2.3.3: Respondents' Country of Origin: In-Home and Out-Of-Home Respondents

Country of Origin*	In-Home Questionnaire Respondents	Out-Of-Home Questionnaire Respondents
Australia	75.7%	78.6%
Emigrated to Australia before five years old**	2.9%	3.4%
United Kingdom/Scotland/Ireland/Wales	8.3%	6.4%
New Zealand	1.6%	1.5%
Italy	1.2%	0.9%
Greece	0.6%	0.5%
Yugoslavia	0.9%	1.3%
Netherlands	0.6%	0.8%
Malta	0.3%	0.2%
Other European	1.3%	0.9%
Vietnam	0.3%	0.2%
Other Asian	1.0%	0.7%
Middle East	0.4%	0.0%
Other	4.5%	3.6%
Refused/No Answer	0.6%	1.0%
Total Respondents (%) ('000)	100.2% 5,223	100.0% 6,754

* the country of origin of people from countries other than Australia was only asked if they had emigrated to Australia after five years of age

** the country of origin of this group was not asked - for the purposes of the study this group was considered to be of an Australian/English speaking background.

2.3 Institutional Consumption Study Methodology

2.3.1 The Institutional Study Questionnaires and Sampling

The range of institutions sampled included:

- hospitals and nursing homes
- welfare or charitable homes
- residential schools and colleges
- prisons
- defence force establishments.

The survey methodology adopted was personal interview based on a structured questionnaire.

The questionnaire was pilot tested amongst 40 institutions (20 Melbourne and 20 Sydney based) between 22 November and 12 December 1990. On the basis of the pilot results the questionnaire was redesigned prior to being adopted for the main study. A copy of the final questionnaire used is given in Appendix IV.

The methodology employed for the two phases of the trade studies (phase 2A and 2B, Figure 2.1.1) was very similar, although slight modifications were required for the seven versions of the questionnaire needed. Therefore, these two studies were considered as one in terms of sample design, interviewing procedures, fieldwork procedures and data processing and will be discussed herein as such.

In total, 1,250 personal interviews (850 retail and catering and 400 wholesale and institutional) were conducted with the range of distribution channels for fish and seafood. Quotas were set on the total number of interviews to be achieved within each segment and State based on the relative importance of the segment and State to the fishing industry, while also ensuring that the total sample for each segment was large enough for reliable conclusions to be drawn. The sample distribution was determined by members of the Steering Committee.

Prior to the final decided distribution of the 1,250 interviews, population figures for each segment, and sub-segments within the seven nominated segments, were collected. This information enabled PA/YCHW to allocate interviews on a proportional basis within each segment to ensure the collection of reliable and valid information for each segment.

Interviews were conducted with the person with the greatest knowledge relating to fish and seafood purchased. Depending on the type of organisation this may have been the manager or store owner, food buyer, or head chef.

Table 2.3.1 details the number of interviews at institutions completed in this research phase. Interviews were evenly split in Waves One and Two with fieldwork being conducted between 15 April and 9 July (to complete a few of the large wholesaler interviews) and 9 September and 4 October, 1991.

Table 2.3.1: Total Number of Interviews Conducted by Type of Institution and City

	Total	Syd	Melb	Brisb	Adel	Per	Hob
Hospital/Nursing Home	169	56	48	28	20	17	-
Welfare/Charitable Home	35	10	14	2	6	3	-
Residential School/ College/ Prison/ Defence	48	10	14	10	4	10	-

2.3.2 Weighting Procedures - Institutional Sample

To determine the total *per capita* consumption of fish and seafood, not only was the data in relation to in-home and out-of-home consumption weighted to the population (of households), but it was also critical to weight consumption data for those residents in non-private dwellings (institutions). The weighting units used were as defined in the 1979/1980 survey funded by the Fishing Industry Research Trust Account¹⁰ (see Table 2.3.2.1).

Table 2.3.2.1: Weighting Factors Used for Each Institution Type

Type of Institution	Weighting Unit
Hospitals/Nursing Home	Beds
Residential College/Boarding School	Full time residents
Welfare and Charitable Home	Full time residents
Prison/Youth Centre	Full time residents
Defence	Regulars

¹⁰ "Institutional and Catering Markets for Fish and Fish Products: Australia", PA Consulting Services, Melbourne, Australia, for the Fishing Industry Research Committee, April 1981.

The first step in the weighting procedure was to convert the purchased weight of fish and seafood to edible weight through the use of the conversion table shown in Appendix VI.

The resultant edible weight for the institution was then adjusted to exclude the portion of meals prepared for people who were not full time residents of the institution - for example staff members who lived off the premises and whose consumption would have been included in estimates of out-of-home consumption derived from the other questionnaires.

The edible weight for the institutions' full time residents was totalled with edible weights from like institutions in each State and then divided by the appropriate weighting unit to give a consumption per weighting unit. For example, for hospitals/nursing homes sampled in New South Wales, the edible weight consumed by full time residents per annum was divided by the total number of beds in the sample to provide a kg per bed per annum figure. This figure was then multiplied by the total "population" of beds in New South Wales. This procedure was followed for each type of institution in each State to give a weighted edible weight consumption figure.

"Population" figures for each weighting factor were obtained from appropriate government departments and the ABS 1986 Census of Population and Housing.

2.4 Classification of Fish and Seafood and Forms of Purchase

Throughout this report the term “fish” is used to refer to finfish while “seafood” refers to shellfish, squid, prawns, lobster, crabs, etc (ie molluscs and crustaceans).

A list of the various types of fish and seafood used to allocate responses in the study is given in Appendix V. The list was developed in consultation with Ruello & Associates. Additional types/species were added to the list during the pilot survey stage.

The allocation of consumption of fish/seafood into the distinct fish and seafood categories was done on the basis of this list, as shown by the right hand column of Appendix V.

In some sections of the report the subcategories shown in Appendix V have been used. These are:

- fish
- seafood
- processed products
- catering products
- bottled, plastic pouches, cups
- canned
- miscellaneous.

It has been clearly stated through footnotes where this categorisation has been used.

Respondents were also asked in what form the fish/seafood they had consumed in-home was purchased. The interviewer then coded responses into one of the forms given in Table 2.4.1. In the *per capita* consumption figures given in the report, the collapsed categories of Table 2.4.1 have been used to allow comparison with 1977 figures.

Table 2.4.1: Form of Purchase Classifications for In-Home Consumption

Comprehensive Form of Purchase/Listing	Collapsed Categories for Fish	Collapsed Categories for Seafood
Fish:		
Fresh whole	Fresh	Fresh
Fresh fillet		
Fresh cutlet		
Fresh headed and gutted/peeled		
Fresh prepared ready to cook		
Frozen whole	Frozen	Frozen
Frozen fillet		
Frozen cutlet		
Frozen headed and gutted/peeled		
Frozen packaged ready to cook	Frozen packaged ready to cook	Frozen packaged ready to cook
Smoked	Smoked	Included in "Other"
Canned	Canned	Canned
Cooked fillet	Cooked fillet	Other (+ smoked)
Glass bottle	Other	
Other		
Don't know		
No answer		

Note: for seafood the fresh fillet; fresh cutlet, frozen fillet, frozen cutlet and smoked forms were not applicable, and caught very few or no responses.

2.5 Estimation of the Weight of Fish/Seafood Consumed

The weight of fish and seafood consumed in-home and out-of-home required respondents to make estimates of household and their own consumption over the past seven days.

To assist in this task, the interviewers conducting the surveys using the 'In-Home' questionnaire were equipped with a set of scale photographs to be used as aids. The photographs showed various sizes, forms and types of fish. The photographs gave estimates of the total weight of fish shown.

Respondents were encouraged to use the aids to estimate the weight of fish consumed. Since the estimates given, whether based upon photographic aids or not, were total fish weight, a factor was later applied to the estimate to convert it to edible weight. The factors used are given in Appendix VI.

No photographic prompts were used for seafood. Instead, respondents could provide either an estimate of weight, size, number of pieces or can(s) (small, medium or large).

Respondents could also provide this kind of information for fish in lieu of an estimate of weight. This was commonly used for processed products such as fish fingers, fish bites, etc and canned products.

The information provided was later converted to edible weight using known average edible piece weights for the type of fish or seafood eaten.

No photographic aids were available to respondents to the 'Out-Of-Home Self Completion' questionnaire. As a check on their estimates, they were also requested to give the number of pieces and/or size of fish/seafood consumed.

Annual consumption figures were calculated by averaging results over the four quarters surveyed and multiplying by 52.143 weeks/year.

2.6 Differences in 1990/91 Versus 1977 Study Methodologies

The methodology used in the 1977 study was highly effective and was carried over into the 1990/91 study mostly unchanged to allow detailed comparison of 1977 versus 1990/91 results. However, some changes and improvements were considered necessary in order to accommodate significant changes in consumption behaviour evident both overseas and in Australia. Most notable has been the dramatic increase in consumption of meals out-of-home.

The differences between the 1977 and 1990/91 studies are:

- the 1990/91 study included all forms of fish and seafood including where fish and seafood was used as an ingredient in other dishes. In 1977 forms such as fish paste, fish soup, seafood pizza, spaghetti marinara and in fried rice were excluded
- the 1977 study recorded fish/seafood consumption as falling into one of three categories: in-home consumption, out-of-home consumption and take-away meals (purchased from fish and chip shops and general take-away outlets). No information was recorded as to whether take-away meals were actually eaten in-home or out-of-home. The last decade has seen a blurring of the distinction between the take-away outlets and restaurants with many take-away chains adding on restaurant style facilities. Hence the 1990/91 study recorded fish/seafood consumption in two main categories based upon where it is actually consumed; in-home or out-of-home
- the 1977 study covered fish/seafood consumption by people living in households located in the seven capital cities except Darwin. The 1990/91 study covered fish/seafood consumption by people living in households **and** people living in institutions. In 1990/91 the population living in regional areas outside the capitals (apart from the Northern Territory) were also covered.

The above mentioned differences in methodologies must be considered when comparing results of the two studies.

3. Detailed Findings - In, Out-Of-Home and Institutional Consumption

Overview

Consumption of fish and seafood in-home and out-of-home was surveyed using three complementary questionnaires, the 'In-Home', 'Out-Of-Home Self Completion' and 'Institutional' questionnaires. Further details of these questionnaires are given in Sections 2.2 and 2.3.

Figure 3.1 has been designed to illustrate the relative coverage of each questionnaire in terms of the survey of fish and seafood consumption. As shown, the 'In-Home' questionnaire surveyed a total of 76.0% of fish and seafood consumption by edible weight, the 'Out-Of-Home' questionnaire surveyed 22.5% and the 'Institutional' Questionnaire the remaining 1.6%.

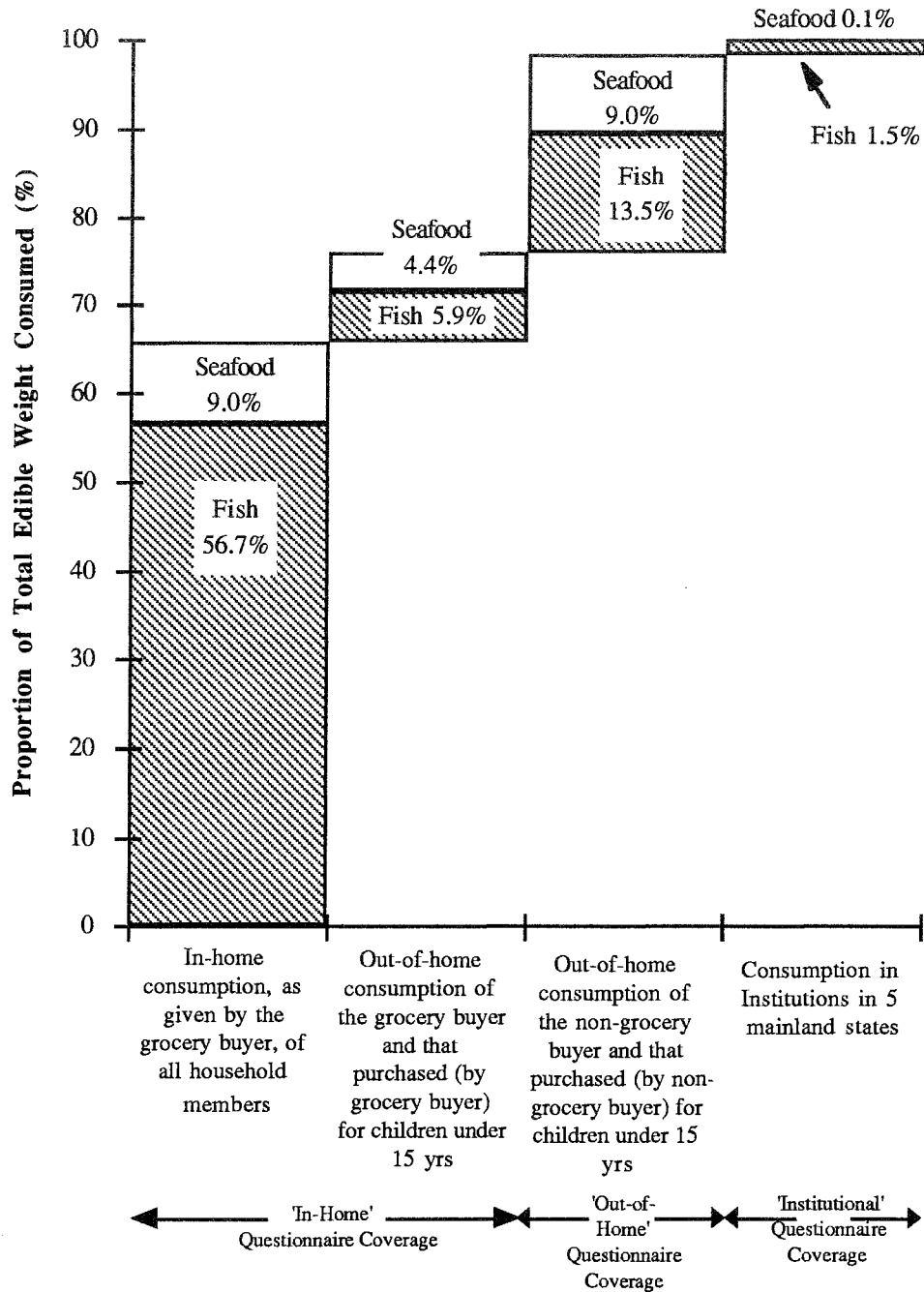
The calculation of the Australian *per capita* consumption of fish and seafood required the inclusion of all consumption recorded in the questionnaires shown in Figure 3.1. The average *per capita* consumption of all Australians surveyed was 11.99kg of which 9.29kg was fish and 2.70kg was seafood. Details of *per capita* consumption amongst people living in households and those living in institutions are shown in Figure 3.2.

Per capita consumption of fish is at a similar level in institutions and the residents of households. However, seafood *per capita* consumption of people living in households is over five times higher than that of people living in institutions.

This Overview Section is the only section of the report in which the fish and seafood consumption of the residents of households and residents of institutions is combined to give an overall consumption figure. Otherwise the consumption of these two groups is analysed separately, recognising that they are two distinct markets.

In many sections of the report the 1990/91 study results have been compared with the 1977 study results. It should be noted that the 1977 study did not cover consumption of fish and seafood in institutions. Hence comparison is made between the 1977 and 1990/91 consumption of the population residing in households only. In these comparisons it should be borne in mind that the 1990/91 study covered capital cities and regional areas of all States apart from the Northern Territory. The 1977 study only covered the capital cities apart from Darwin. Refer to Section 2.6 for details of 1977 and 1990/91 study differences.

Figure 3.1: The Survey of Fish/Seafood Consumption



Base: 5,221,710 (Weighted) Households and 5 mainland states institutions.

Figure 3.2: Australians' *per capita* Consumption of Fish and Seafood

Per capita consumption of
Australians residing in
households

Fish	9.31kg
Seafood	2.74kg
Total	12.06kg

Per capita consumption of
Australians residing in
institutions

Fish	8.28kg
Seafood	0.53kg
Total	8.81kg

Per capita consumption of
all Australians

Fish	9.29kg
Seafood	2.70kg
Total	11.99kg

3.1 Fish and Seafood Consumption Results: In-Home and Out-Of-Home

3.1.1 In and Out-Of-Home Consumption 1977 Versus 1990 Study

The total *per capita* consumption calculated from the questionnaire results (after weighting) was 12.06kg as compared to the result from the 1977 study of 10.07kg. Table 3.1.1.1 compares the results of the 1990/91 survey with 1977. It shows that the bulk of the rise in consumption has been accounted for in the 'Out-Of-Home' questionnaire. This questionnaire surveys the fish/seafood purchases of the non-grocery buyer for out-of-home consumption.

In the Sections 3.1.2 through 3.1.7 that follow, in-home and out-of-home *per capita* consumption figures are presented in tabular form for various demographic groups. In most of these tables the out-of-home consumption of the grocery buyer and that purchased (by the grocery buyer) for children under 15 years of age is presented as the sole out-of-home consumption figure. The out-of-home consumption of the non-grocery buyer has not been presented owing to the low sample size of non-grocery buyers (see Section 2.2.1). Breaking this sample down into smaller demographic groups was not possible.

The tables and footnotes clearly indicate the figures that have been used.

**Table 3.1.1.1: Fish and Seafood *per capita* Consumption
- Derivation and Comparisons: 1977 Versus 1990/91**

	Fish			Seafood		
	1977	1990/91	CAGR*	1977	1990/91	CAGR*
In-home consumption	NA	6.94kg	-	NA	1.11kg	-
Out-of-home consumption known by grocery buyer including that purchased for children < 15 years to eat out	NA	0.72kg	-	NA	0.54kg	-
Total consumption known of by grocery buyer (ie 'In-Home' questionnaire respondent)	7.10kg	7.66kg	0.6%	1.70kg	1.65kg	-0.2%
Out-of-home consumption from 'Out-Of-Home' questionnaire including that purchased for children < 15 years (ie total consumption known of by non-grocery buyer respondents)	0.70kg	1.66kg	6.9%	0.57kg	1.10kg	5.19%
Total <i>per capita</i> consumption	7.8kg	9.31kg	1.4%	2.27kg	2.74kg	1.5%

* *Compound Annual Growth Rate*

NA indicates that this figure is not available.

3.1.2 Form of Fish and Seafood Consumed Per Person by Where Consumed

Table 3.1.2.1 provides a breakdown of annual *per capita* consumption of fish/seafood in accordance with whether it was in or out-of-home. For the in-home consumption, details of the form of purchase of the fish/seafood has also been given.

67% of all fish/seafood consumption by weight is in-home while the equivalent figure for fish is 74% and for seafood is 40%.

Comparison with figures for 1977 reveals a substantial increase in the in-home consumption of fresh and frozen fish, rising from 2.90kg *per capita* to 4.26kg *per capita*. Fish fingers in-home consumption has declined markedly. Canned fish consumption in-home has declined from 1.81kg *per capita* to 1.39kg *per capita*.

Consumption in-home of fresh and frozen seafood has declined from 0.80kg *per capita* to 0.68kg *per capita*.

A comparison with total in-home and out-of-home fish and seafood consumption 1977 versus 1990/91 is not possible. The 1977 study used the classifications “fish from take-away” and “seafood from take-away” which did not specify where such fish and seafood was actually consumed. Consumption recorded in these categories can therefore not be allocated as in-home or out-of-home consumption (see Section 2.6).

However, Table 3.1.2.2 shows 1990/91 results recast to align with the classifications used in 1977 for direct comparison. In 1990/91 *per capita* consumption of precooked fish and seafood purchased from fish and chip shops or take-aways was 0.83kg (the addition of 0.68kg and 0.15kg in Table 3.1.2.2) and 0.27kg (addition of 0.10kg and 0.17kg) respectively. These figures are down on the equivalent 1977 results of 1.10kg and 0.54kg respectively, indicating a decline in the popularity of fish and seafood meals purchased precooked from fish and chip shops/take-aways.

On the other hand, fish and seafood consumption out-of-home purchased/consumed at places other than fish and chip shops/take-aways has more than doubled in *per capita* terms (Table 3.1.2.2) over the years 1977 to 1990/91.

Table 3.1.2.1: Where and In What Form Fish and Seafood Was Consumed 1990/91 Versus 1977

	1977	1990/91
In-home consumption:		
Fish:		
Fresh	} 2.90	3.75
Frozen		0.51
Fish fingers	0.66	0.15
Other frozen packaged	0.30	0.22
Canned	1.81	1.39
Smoked	0.24	0.13
Cooked fillet	NA	0.58
Other†	0.04	0.20
Total fish eaten in-home	NA	6.94
Seafood:		
Fresh	} 0.80	0.61
Frozen		0.07
Frozen packaged	0.09	0.06
Canned	0.12	0.05
Other*	0.02	0.32
Total seafood eaten in-home	NA	1.11
Total in-home fish/seafood consumption	NA	8.05
Out-of-home consumption:		
Fish:		
Fish	NA	2.38
Fish from take-away	1.10	NA
Fish eaten out-of-home	0.82	NA
Total fish eaten out-of-home	NA	2.38
Seafood:		
Seafood	NA	1.64
Seafood from take-away	0.54	NA
Seafood eaten out-of-home	0.70	NA
Total seafood eaten out-of-home	NA	1.64
Total out-of-home fish/seafood consumption	NA	4.02
Total in/out-of-home fish/seafood consumption	10.14	12.06

Note: see comments on next page

Note: NA indicates not available. The 1977 study used a category of fish and seafood consumption based on purchases from take-aways. This category did not specify whether the fish/seafood was consumed in or out-of-home. Hence a split of in and out-of-home consumption could not be made based on the 1977 figure.

† "other fish" includes fish purchased in glass bottles, fish cakes, as an ingredient in pizza and Chinese etc, take-away meals, don't know or no answer. Hence this category included some take-away meals which in the 1977 study was treated separately under the heading "fish from take-aways"

** "other seafood" includes seafood purchased in cooked form, as ingredients in pizza, Chinese etc, take-away meals, crumbed, in glass bottles, don't know, no answer. Hence this category included take-aways which in 1977 was treated separately under "seafood from take-aways".*

Table 3.1.2.2: Fish and Seafood Consumption By Categories Used in 1977: 1977 Versus 1990/91 (kg per capita)

Forms of fish and seafood	Fish		Seafood		Total	
	1977	1990/91	1977	1990/91	1977	1990/91
Fresh and frozen	2.90	4.12	0.80	0.67	3.70	4.80
Fish fingers	0.66	0.15	-	-	0.66	0.15
Frozen packaged	0.30	0.22	0.09	0.05	0.39	0.27
Tinned	1.81	1.39	0.12	0.05	1.93	1.44
Smoked	0.24	0.13	-	-	0.24	0.13
Other	0.04	0.25	0.02	0.24	0.06	0.48
Total at home except take-away meals	5.96	6.26	1.03	1.01	6.99	7.27
Take-away eaten in-home	} 1.10	0.68	} 0.54	0.10	} 1.64	0.78
Take-away eaten out-of-home		0.15		0.17		0.32
Eaten out	0.82	2.22	0.70	1.47	1.52	3.69
Total	7.88	9.32	2.27	2.74	10.14	12.06

3.1.3 Consumption According to Region and Form of Purchase

The city or regional area of highest *per capita* consumption in and out-of-home was Perth at 14.71kg, followed by Sydney at 13.52kg and Hobart at 12.74kg (see Table 3.1.3.1).

Perth's particularly high *per capita* consumption of frozen fish was the major reason for its high placing. In general, the regional areas surveyed showed *per capita* consumption figures that were not widely different from the cities. Illustrating this point, the *per capita* consumption of fish and seafood across all cities was 12.47kg compared to that across all regional areas of 11.36kg.

Table 3.1.3.1: Per Capita Fish and Seafood Consumption by Region and Form of Purchase

	Syd	Reg NSW	Melb	Reg VIC	Bris	Reg QLD	Adel	Reg SA	Per	Reg WA	Can	Hob	Reg TAS	Totals all regions
Fish In-Home:														
Fresh	4.30	3.84	4.03	2.05	3.12	3.82	3.72	3.75	4.20	2.60	3.24	4.30	3.44	3.75
Frozen	0.43	0.37	0.22	0.19	0.51	0.37	0.31	0.71	2.25	1.42	0.28	0.39	0.64	0.51
Fish fingers	0.17	0.23	0.10	0.14	0.09	0.16	0.12	0.10	0.24	0.04	0.11	0.09	0.03	0.15
Other frozen packaged	0.39	0.20	0.17	0.27	0.26	0.08	0.09	0.09	0.20	0.13	0.21	0.07	0.00	0.22
Canned	1.54	1.56	1.26	0.98	1.49	1.34	1.61	1.61	1.28	1.36	1.28	1.01	1.21	1.39
Smoked	0.14	0.18	0.12	0.12	0.15	0.18	0.08	0.03	0.11	0.07	0.03	0.13	0.21	0.13
Cooked fillet	0.24	0.62	0.66	0.88	0.85	0.81	0.46	0.35	0.78	0.76	0.26	0.77	0.24	0.58
Other	0.15	0.38	0.14	0.30	0.06	0.13	0.06	0.24	0.35	0.33	0.22	0.39	0.28	0.20
Total in-home fish	7.37	7.37	6.71	4.94	6.53	6.88	6.45	6.86	9.41	6.71	5.62	7.16	6.04	6.94
Fish Out-of-Home:**	2.58	2.37	2.39	2.12	2.23	2.46	2.19	2.21	2.34	2.20	2.50	2.61	1.94	2.37
Total Fish In & Out-of-Home:	9.95	9.74	9.10	7.06	8.76	9.34	8.64	9.08	11.75	8.91	8.12	9.77	7.98	9.31
Seafood In-Home:														
Fresh	1.02	0.45	0.45	0.12	0.65	0.46	0.63	0.94	0.78	0.32	0.19	0.79	0.31	0.61
Frozen	0.15	0.08	0.06	0.17	0.07	0.10	0.16	0.03	0.39	0.26	0.29	0.11	0.24	0.13
Canned	0.10	0.02	0.04	0.01	0.00	0.01	0.02	0.18	0.04	0.08	0.03	0.11	0.12	0.05
Other	0.28	0.73	0.33	0.28	0.12	0.19	0.31	0.07	0.19	0.18	0.27	0.41	0.34	0.32
Total in-home seafood	1.54	1.29	0.88	0.58	0.84	0.75	1.13	1.22	1.40	0.83	0.77	1.41	1.01	1.11
Seafood Out-of-Home:**	2.03	1.48	1.54	1.45	1.60	1.63	1.50	1.31	1.56	1.48	1.76	1.56	1.38	1.64
Total Seafood In & Out-of-Home:	3.57	2.77	2.42	2.03	2.45	2.38	2.62	2.53	2.96	2.31	2.53	2.97	2.39	2.74
Total Fish/Seafood In & Out-of-Home:	13.52	12.51	11.52	9.09	11.21	11.72	11.27	11.60	14.71	11.22	10.65	12.74	10.38	12.06

* frozen other is the sum of any consumption recorded under the frozen cutlet or frozen headed and gutted/peeled categories

** includes grocery buyer, non-grocery buyer and children's consumption. However, the differences in out-of-home fish and seafood consumption between regions only reflects that in the grocery buyer's consumption and that purchased by the grocery buyer for children less than 15 years. The non-grocery buyer's consumption and that purchased by the non-grocery buyer for children under 15 years has been incorporated as an average figure equal across all regions.

3.2 Frequency of Consumption of Fish and Seafood

3.2.1 Households Never Eating Fish and Seafood

Frequency of fish and seafood consumption was ascertained on the basis of both the household as the consuming unit and the individual.

The classification of households and individuals as fish/seafood eaters or non fish/seafood eaters is defined as follows. Individuals in a household were classified as non fish/seafood eaters if the In-Home questionnaire respondent could not recall the person having eaten fish/seafood in the last year either in-home or out-of-home.

Households were classified as non fish/seafood eating if all members of the household were non fish/seafood eaters by the previous definition.

Table 3.2.1.1 provides a breakdown of fish/seafood eating households by several demographic variables.

Overall, there were very few households that could be classified as non fish/seafood consuming - only 2.3%. In the 1977 PA study, 5% of households never served fish and almost 20% never served any form of seafood. However, the present study classifies households in which fish/seafood may never be served *in-home* but has been consumed by a household member *out-of-home* as fish/seafood eating households. The 1977 PA study did not include this group.

Table 3.2.1.1: Household Fish/Seafood Consumption

	Eat Fish/Seafood	Don't Eat Fish Seafood
Total	97.7%	2.3%
Region		
Sydney	98.2%	1.8%
Regional NSW	97.4%	2.6%
Melbourne	99.1%	0.9%
Regional VIC	95.3%	4.7%
Brisbane	98.1%	1.9%
Regional QLD	95.7%	4.3%
Adelaide	99.4%	0.6%
Regional SA	98.4%	1.6%
Perth	98.5%	1.5%
Regional WA	97.9%	2.1%
Canberra	97.2%	2.8%
Hobart	97.6%	2.4%
Regional TAS	87.4%	12.6%
Area		
Coastal Area	98.1%	1.9%
Inland Area	95.7%	4.3%
Sex of Respondent		
Male	97.0%	3.0%
Female	97.9%	2.1%
Age Group of Respondent		
Under 40 Years	97.8%	2.2%
40 - 59 Years	98.1%	1.9%
Over 60 Years	97.1%	2.9%

Table 3.2.1.1 shows the proportion of fish/seafood eating households does not greatly vary by region apart from regional Tasmania which has a high 12.6% of households classified as non fish/seafood eating.

Inland areas also show a slightly higher proportion of households that are non fish/seafood eating, possibly as a result of limited retail outlets and catering/restaurant outlets.

The sex and age group of the main food preparer were not determinants of whether the household was classified as fish/seafood eating.

Not shown is the marital status of the main food preparer and household composition since these variables also had little effect on household classification as a fish/seafood eating versus non-eating household. Table 3.2.1.2 shows household income was not a factor in determining consumption versus non-consumption of fish/seafood.

Table 3.2.1.2: The Effect of Household Income on the Consumption Versus Non-Consumption of Fish and Seafood - all Areas, % of Households in Each Group

Household Income	Don't Eat Fish/Seafood	Eat Fish/Seafood
Less than \$15,000	3.9%	96.1%
\$15,001 to \$25,000	3.0%	97.0%
\$25,001 to \$40,000	1.9%	98.1%
\$40,001 to \$60,000	1.1%	98.9%
Over \$60,000	1.6%	98.4%
All households	2.3%	97.7%

3.2.2 Persons Never Eating Fish and Seafood

Table 3.2.2.1 shows that 94.6% of individuals were classified as fish/seafood eaters. That is, they had eaten fish/seafood in the last year as recalled by the main food preparer in the household. Only 4.9% were classed as non fish/seafood consumers, significantly less than the 7.8% of the population in the 1977 PA study.

There was no difference in the proportion of females and males who were classed as non fish/seafood consumers.

As in the 1977 PA study, over a quarter of children in the 0 - 7 year age group were non fish/seafood consumers, though this can largely be attributed to the limited range of foods infants consume in the first years of life.

Table 3.2.2.1: Persons Eating/Not Eating Fish or Seafood in the Last Year: As Recalled by the Respondent

	Total	All males in households							
	Male & Female	Total Male	0 - 2 Years	3 - 9 Years	10 - 14 Years	15 - 19 Years	20 - 39 Years	40 - 59 Years	60+ Years
Eaten	94.6%	94.7%	72.9%	95.4%	93.8%	93.4%	94.8%	96.9%	97.1%
Not Eaten	4.9%	4.6%	25.8%	4.2%	5.4%	5.9%	4.3%	2.9%	2.7%
Don't Know	0.4%	0.5%	1.3%	0.2%	0.6%	0.5%	0.8%	0.1%	0.2%
No Answer	0.1%	0.1%	0.0%	0.1%	0.2%	0.2%	0.1%	0.1%	0.0%

	All females in households							
	Total Female	0 - 2 Years	3 - 9 Years	10 - 14 Years	15 - 19 Years	20 - 39 Years	40 - 59 Years	60+ Years
Eaten	94.5%	70.9%	94.7%	94.4%	91.6%	95.3%	97.2%	95.6%
Not Eaten	5.1%	27.5%	5.1%	5.0%	7.2%	4.1%	2.7%	4.4%
Don't Know	0.3%	1.6%	0.1%	0.3%	0.9%	0.6%	0.1%	0.0%
No Answer	0.1%	0.0%	0.2%	0.3%	0.3%	0.1%	0.0%	0.0%

3.2.3 Proportion of Households Consuming Fish and Seafood in the last seven days

Of households that we classified as fish/seafood consuming, 59% had consumed a fish/seafood meal in-home over the last seven days. This is based upon meals consumed in-home by the main food preparer.

There was very little variation by region in the proportion. Household income had little or no effect. However, age group of the main food preparer, marital status, household composition and nationality all had significant effect on the proportion, as shown in Table 3.2.3.1.

These results are in contrast to those of Section 3.2.1 which show the classification of households as fish/seafood consuming or non-consuming as not being affected by these demographic variables.

This suggests that “older” families, families based upon married/de facto relationships and families of immigrants from non-English speaking countries are more frequent consumers of fish/seafood in the home. These issues are studied in more detail in Section 3.4.

Table 3.2.3.1: Households Eating Fish/Seafood in Last Seven Days: Demographics

Demographics of Respondent/Household	Proportion of Fish/Seafood Eating Households eating fish/seafood in home in last seven days
Respondent Age Group:	
Under 40 years	54%
40-59 years	64%
60+ years	62%
Respondent Marital Status:	
Single	47%
Married	63%
Divorced/Separated/Widowed	56%
English/Non-English Speaking Background:	
Australian/English speaking country*	58%
Non-English speaking country**	66%
Household Income:	
Less than \$15,000	55%
\$15,001-\$25,000	61%
\$25,001-\$40,000	60%
\$40,001-\$60,000	62%
More than \$60,000	58%

* either born in Australia, emigrated to Australia before five years old or emigrated to Australia from an English speaking country after five years old

** emigrated to Australia from a non-English speaking country after five years old.

3.2.4 Frequency of Fish or Seafood Consumption In-Home

Tables 3.2.4.1 and 3.2.4.2 show the frequency of fish or seafood consumption in-home by the various forms of fish or seafood in meal-type-occasions (see Glossary of Terms). Table 3.2.4.1 shows 55.2% of all households did eat fish at least once in-home in the past seven days. The figure for 1977 was 59.9% which did not include any in-home consumption of take-away forms of fish as described in Table 3.2.4.1 footnotes.

A comparison of the average number of times each form of fish is served per annum (per household), 1977 versus 1990/91, is shown in Table 3.2.4.1. The frequency of consumption of most forms of fish in-home has declined markedly since 1977. Only "other" forms of fish and fresh fish consumption frequency has risen since 1977 though the comparison is not strictly valid (see Table footnotes).

The decline in-home in *per capita* consumption of fish fingers shown in Table 3.1.2.1 is reflected in a decline of "frozen packaged" fish consumption frequency. Similarly canned and smoked fish consumption in-home has declined markedly.

Only fresh and frozen fish consumption frequency in-home has remained relatively stable, declining from 21.8 meal-type-occasions per annum in 1977 to 18.2 meal-type-occasions per annum in 1990/91. *Per capita* consumption of these forms of fish has actually increased (Table 3.1.2.1). However, this is due to increased average serve sizes which are discussed in Section 3.3.1 ahead.

**Table 3.2.4.1: Frequency of In-Home Fish Consumption
by Form of Purchase: Based on Meal-Type-Occasions**

	Cooked Fillet	Fresh	Frozen	Frozen†† Packaged	Smoked	Canned	Other	Total Fish
Total households ('000)	5223	5223	5223	5223	5223	5223	5223	5223
Non fish/seafood consuming households	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%
Fish/seafood consuming households not eating in last 7 days	91.3%	72.3%	93.3%	92.7%	96.3%	75.4%	95.1%	42.5%
% eaten in last 7 days	6.3%	25.4%	4.4%	5.0%	1.3%	22.3%	2.6%	55.2%
Eaten once	5.8%	18.3%	3.6%	4.4%	1.2%	15.8%	1.7%	33.1%
Eaten twice	0.5%	5.0%	0.5%	0.5%	0.1%	4.5%	0.6%	13.7%
Eaten three times	0.0%	1.3%	0.1%	0.2%	0.0%	1.3%	0.1%	4.8%
Eaten four times	0.0%	0.5%	0.1%	0.0%	0.0%	0.4%	0.1%	2.2%
Eaten five times or more	0.0%	0.3%	0.1%	0.0%	0.0%	0.3%	0.0%	1.4%
Average times per week†	0.07	0.36	0.06	0.06	0.02	0.32	0.04	0.92
Average times per annum†	3.6	18.7	3.1	3.0	0.8	16.8	2.0	47.8
Average times per annum 1977†	NA*	----- 18.2-----	-----	9.9	2.1	28.1	0.5*	59.8*

* does not include in-home consumption of take-away fish meals since in 1977 this data was not separated by whether it was eaten in-home or out-of-home

† ie the average number of times the fish type is served in-home per household.

†† includes fish fingers.

Table 3.2.4.2 shows that the frequency of consumption of fresh, frozen and frozen packaged forms of seafood in-home has also declined since 1977. Only "other" forms of seafood (namely seafood purchased in cooked form and used as an ingredient) have shown increased consumption since 1977. However, this is mostly attributed to the inclusion in 1990/91 of take-away meals and some meals using seafood as an ingredient that were not included in 1977 in-home consumption (see Table footnote and Section 2.6).

Table 3.2.4.2: Frequency of In-Home Seafood Consumption by Form of Purchase: Based on Meal-Type-Occasions

	Fresh	Frozen	Frozen Packaged	Canned	Other	Total Seafood
Total households ('000)	5223	5223	5223	5223	5223	5223
Non fish/seafood consuming households	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%
Fish/seafood consuming households not eating in last 7 days	92.3%	96.9%	97.1%	96.9%	93.1%	86.3%
% eaten in last 7 days	5.3%	0.8%	0.6%	0.8%	4.6%	11.4%
Eaten once	3.9%	0.6%	0.5%	0.6%	3.7%	8.3%
Eaten twice	1.1%	0.1%	0.1%	0.1%	0.6%	2.1%
Eaten three times	0.2%	0.0%	0.0%	0.0%	0.2%	0.6%
Eaten four times	0.1%	0.0%	0.0%	0.0%	0.1%	0.3%
Eaten five times or more	0.1%	0.0%	0.0%	0.0%	0.1%	0.2%
Average times per week†	0.08	0.01	0.01	0.01	0.06	0.16
Average times per annum†	3.9	0.5	0.4	0.6	3.2	8.5
Average times per annum 1977†	-----	5.0 -----	1.0	3.1	0.1*	9.2*

* does not include consumption of seafood take-away meals in-home since 1977 data did not split take-away meals by in or out-of-home consumption. For the record the 1977 consumption frequency of take-away (cooked seafood) meals was an average of 3.1 per annum

† ie the average number of times the seafood type is served in-home per household.

3.2.5 Frequency of Fish and Seafood Consumption Out-Of-Home

Based upon grocery buyers' and non grocery buyers' account of their out-of-home fish and seafood consumption over the previous seven days, the frequency of their fish and seafood consumption can be measured. Tables 3.2.5.1, 3.2.5.2, 3.2.5.3 and 3.2.5.4 show how often grocery buyers and non grocery buyers ate fish and seafood out-of-home in the last week in either of 11 different places of purchase and/or consumption. The figures shown are based upon meal-type-occasions.

The bottom two rows of each table provide an overall average number of meal-type-occasions per week or per annum across all grocery or non grocery buyers. It can be seen that restaurants were the most popular places for fish and especially seafood consumption out-of-home.

A comparison with the average times fish and seafood was eaten out-of-home in the 1977 study shows the frequency of out-of-home consumption to have increased dramatically (Table 3.2.5.5).

Table 3.2.5.5: The Frequency of Fish and Seafood Consumption Out-Of-Home 1977 Versus 1990/91: Number of Times Per Annum for Grocery and Non-Grocery Buyers

	1977	1990/91
Fish	6.8	19.7
Cooked fish*	8.3	NA
Seafood	6.8	12.5
Cooked Seafood*	3.1	NA

** in the 1977 study cooked fish and seafood from take-aways were stand alone categories with no allocation as either in or out-of-home consumption. Hence, some proportion of the 8.3 times and 3.1 times per annum must be out-of-home consumption though the exact proportion cannot be determined
NA means not available since 1990/91 figures allocated **all** fish and seafood consumption by whether it was consumed in or out-of-home.*

Table 3.2.5.1: Frequency of Fish Consumption Out-Of-Home by Place of Purchase/Consumption: Grocery Buyer: Meal-Type-Occasions

	Work café	Restaurant	Function	Club	Hotel	Café	Fish and chip shop	Fast food bar	Milk bar	Friends/ relatives	Other	Total
Total number of grocery buyers ('000)	5223	5223	5223	5223	5223	5223	5223	5223	5223	5223	5223	5223
% grocery buyers not eating fish in last 7 days	98.60%	96.15%	99.62%	98.64%	99.02%	99.54%	98.32%	98.93%	99.25%	96.23%	97.30%	83.61%
% eating fish in last week	1.40%	3.85%	0.38%	1.36%	0.98%	0.46%	1.68%	1.07%	0.75%	3.77%	2.70%	16.39%
Eaten fish once last week	1.00%	3.29%	0.27%	1.28%	0.90%	0.38%	1.40%	1.03%	0.54%	3.31%	1.80%	11.89%
Eaten fish twice last week	0.31%	0.48%	0.10%	0.04%	0.06%	0.08%	0.15%	0.04%	0.11%	0.40%	0.65%	3.25%
Eaten fish three times last week	0.06%	0.06%	0.00%	0.04%	0.00%	0.00%	0.06%	0.00%	0.02%	0.04%	0.19%	0.73%
Eaten fish four times last week	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%	0.04%	0.00%	0.04%	0.02%	0.00%	0.31%
Eaten fish five times or more last week	0.04%	0.02%	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%	0.04%	0.00%	0.06%	0.19%
Average times per week	0.023	0.061	0.006	0.021	0.014	0.007	0.024	0.016	0.013	0.051	0.043	0.279
Average times per annum	1.19	3.15	0.33	1.08	0.71	0.36	1.25	0.86	0.69	2.68	2.24	14.53

Table 3.2.5.2: Frequency of Fish Consumption Out-Of-Home by Place of Purchase/Consumption: Non Grocery Buyer: Meal-Type-Occasions

	Work café	Restaurant	Function	Club	Hotel	Café	Fish and chip shop	Fast food bar	Milk bar	Friends/ relatives	Other	Total
Total number of non-grocery buyers ('000)	6754	6754	6754	6754	6754	6754	6754	6754	6754	6754	6754	6754
% non-grocery buyers not eating fish in last 7 days	97.01%	91.50%	99.54%	97.90%	98.30%	99.27%	92.89%	97.22%	98.22%	96.56%	95.00%	70.02%
% eating fish in last week	2.55%	6.63%	0.46%	1.82%	1.70%	0.73%	6.46%	2.78%	1.54%	2.25%	3.66%	20.64%
Eaten fish once last week	0.00%	1.21%	0.00%	0.28%	0.00%	0.00%	0.41%	0.00%	0.24%	0.96%	0.84%	4.92%
Eaten fish twice last week	0.21%	0.44%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.22%	0.24%	3.08%
Eaten fish three times last week	0.00%	0.21%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.27%	1.11%
Eaten fish four times last week	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.24%
Eaten fish five times or more last week	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.24%
Average times per week	0.044	0.112	0.005	0.024	0.017	0.007	0.080	0.028	0.020	0.048	0.071	0.456
Average times per annum	2.27	5.85	0.24	1.24	0.89	0.38	4.17	1.45	1.05	2.52	3.71	23.78

**Table 3.2.5.3: Frequency of Seafood Consumption Out-Of-Home by Place of Purchase/Consumption: Grocery Buyer:
Meal-Type-Occasions**

	Work café	Restaurant	Function	Club	Hotel	Café	Fish and chip shop	Fast food bar	Milk bar	Friends/ relatives	Other	Total
Total number of grocery buyers ('000)	5223	5223	5223	5223	5223	5223	5223	5223	5223	5223	5223	5223
% grocery buyers not eating seafood in last 7 days	99.62%	92.63%	99.67%	99.08%	99.00%	99.71%	99.54%	98.87%	99.66%	98.10%	99.27%	86.64%
% eating seafood in last week	0.38%	7.37%	0.33%	0.92%	1.00%	0.29%	0.46%	1.13%	0.34%	1.90%	0.73%	13.36%
Eaten seafood once last week	0.31%	4.81%	0.19%	0.67%	0.73%	0.25%	0.36%	0.88%	0.29%	1.44%	0.54%	8.33%
Eaten seafood twice last week	0.04%	1.76%	0.11%	0.25%	0.27%	0.04%	0.04%	0.17%	0.04%	0.36%	0.15%	3.47%
Eaten seafood three times last week	0.02%	0.50%	0.00%	0.00%	0.00%	0.00%	0.04%	0.04%	0.02%	0.08%	0.00%	0.98%
Eaten seafood four times last week	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.02%	0.02%	0.33%
Eaten seafood five times or more last week	0.00%	0.17%	0.00%	0.00%	0.00%	0.00%	0.00%	0.04%	0.00%	0.00%	0.02%	0.31%
Average times per week	0.004	0.112	0.004	0.012	0.013	0.003	0.006	0.015	0.004	0.025	0.010	0.209
Average times per annum	0.23	5.83	0.22	0.61	0.66	0.17	0.33	0.80	0.22	1.29	0.53	10.88

3.2.5.4: Frequency of Seafood Consumption Out-Of-Home by Place of Purchase/Consumption: Non Grocery Buyer: Meal-Type Occasions

	Work Café	Restaurant	Function	Club	Hotel	Café	Fish and chip shop	Fast Food Bar	Milk Bar	Friends/ relatives	Other	Total
Total number of non-grocery buyers ('000)	6754	6754	6754	6754	6754	6754	6754	6754	6754	6754	6754	6754
% non-grocery buyers not eating seafood in last 7 days	99.26%	90.95%	99.42%	98.47%	98.27%	99.85%	98.74%	98.02%	99.38%	98.83%	98.42%	81.79%
% eating seafood in last week	0.74%	9.05%	0.58%	1.53%	1.73%	0.15%	1.26%	1.98%	0.62%	1.17%	1.58%	18.21%
Eaten seafood once last week	0.96%	7.72%	0.75%	1.44%	1.93%	0.19%	1.32%	2.30%	0.54%	1.32%	1.47%	15.16%
Eaten seafood twice last week	0.00%	3.41%	0.00%	0.54%	0.31%	0.00%	0.00%	0.27%	0.27%	0.19%	0.27%	6.66%
Eaten seafood three times last week	0.00%	0.57%	0.00%	0.00%	0.00%	0.00%	0.31%	0.00%	0.00%	0.00%	0.31%	1.42%
Eaten seafood four times last week	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.31%
Eaten seafood five times or more last week	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Average times per week	0.007	0.126	0.006	0.019	0.020	0.001	0.017	0.022	0.008	0.013	0.023	0.263
Average times per annum	0.39	6.55	0.30	1.01	1.03	0.08	0.90	1.14	0.43	0.69	1.18	13.70

3.3 Average Serve Size and Price - In-Home Meals

3.3.1 Weight of an Average Serving of Fish or Seafood

The average serve size of different forms (of purchase) of fish and seafood was calculated by dividing the total weight consumed by the total number of people who did consume each form of fish/seafood. This calculation was made across the entire weighted sample.

Results are show in Table 3.3.1.1. Canned and bottled products are generally consumed in smaller quantities than most other forms.

To allow comparison with 1977 results, the categories of “form bought” used in Table 3.3.1.1 have been combined to reproduce, as closely as possible, the forms used in 1977. In many of the comparisons shown in Tables 3.3.1.2 and 3.3.1.3, 1990/1991 serve sizes are significantly larger than those in 1977.

The reasons for serve size increases are unclear - it could relate to changes in species consumed, packaging, place of purchase, preparation and serving that have occurred since the 1977 study. For example, in 1977 smoked cod (which in 1990/91 accounts for approximately half of smoked fish consumption in the home) was sold by most fishmongers and by supermarkets. In 1990/91 smoked cod was sold by few fishmongers and has become almost exclusively a supermarket line. The foam tray pack sold by one of the large supermarket chains contains six smoked cod pieces per kg (166grms per piece). Most of canned fish consumption is of tuna and salmon that is sold in small, medium and large can sizes that are little changed in size from 1977. However, industry sources report that most canned tuna and salmon sales are now of the medium and large cans. In 1977 small cans accounted for most sales. In addition, canned tuna and salmon has been more aggressively promoted in the years since 1977, especially for use in casseroles and mornays. (Section 4.4.2 confirms this usage shift.)

Almost 70% of canned seafood meal-type-occasions were either canned oysters or canned prawns/shrimps. Canned prawns are mostly sold in 200gm or 220gm cans while canned oysters in 105gm cans. Hence the very large 199gm average serve size appears high. The increased average serve size from 1977 to the present may be due to an increase in the use of canned seafood as an ingredient in other meals, as shown in survey results discussed in Section 4.4.2.

Table 3.3.1.1: Average Serve Sizes of Fish and Seafood by Form of Purchase

Form bought	Av Serve Size: Fish (grms)	Av Serve Size: Seafood (grms)
Fresh whole	190	140
Fresh fillet	230	NA
Fresh cutlet	242	-
Fresh headed and gutted/peeled	271	165
Frozen whole	238	157
Frozen fillet	196	NA
Frozen cutlet	-	-
Frozen headed and gutted/peeled	-	212
Fresh prepared ready to cook	257	189
Frozen packaged ready to cook	142	199
Smoked	222	-
Canned	114	89
Glass bottle	61	-
Cooked fillet	173	NA
Other	148	103

*Note: those categories in which a serve size has not been given have not been served frequently enough for reliable estimates of serve size to be made
NA - not an applicable category for seafood.*

Table 3.3.1.2: Average Serve Size of Fish by Form of Purchase: 1977 Versus 1990/91

Form of fish:	Average Serve Size	
	1977 Study	1990/91 Study
Fresh and frozen	168grms	218grms
Packaged frozen*	155grms	159grms
Fish fingers	89grms	124grms
Tinned/canned	68grms	114grms
Smoked	120grms	222grms
Cooked fish/fillet**	88grms	173grms

* *excluding fish fingers*

** 1977 "cooked fish" was term used
1990/91 "cooked fillet" was term used.

Table 3.3.1.3: Average Serve Size of Seafood by Form of Purchase: 1977 Versus 1990/91

Form of seafood:	Average Serve Size	
	1977 Study	1990/91 Study
Fresh and frozen	152grms	153grms
Tinned/canned	38grms	89grms

3.3.2 Price Per Serve of Fish or Seafood

The average price per serving of the different forms of fish and seafood was calculated by dividing the total price of the fish or seafood served at a meal by the number of people who consumed the meal. As in Section 3.3.1, this calculation was made across the weighted sample. The results are shown in Table 3.3.2.1. The figures shown are averaged across the four quarters in which the survey was conducted and across all cities and regions surveyed. As such, they should only be seen as a guide to the relative expense of certain fish and seafood. Prices of fish and seafood do vary considerably by place and time of purchase.

In spite of the generally smaller serves of seafood compared to fish (Table 3.3.1.1), the price of a seafood serve is more expensive for most forms purchased. For example, the price of a serve of seafood purchased fresh whole at \$2.69 is double that of fresh whole fish at \$1.32.

Tables 3.3.2.2 and 3.3.2.3 show price per serve of the most commonly consumed species of fish and seafood in the home. Orange roughy and perch were the most expensive fish species per serve; whole prawns were the most expensive seafood per serve.

Table 3.3.2.1: Average Price/Serve of Fish and Seafood by Form or Purchase

Form bought	Av Price/Serve: Fish (\$)	Av Price/Serve: Seafood (\$)
Fresh whole	\$1.32	\$2.69
Fresh fillet	\$2.29	-
Fresh cutlet	\$2.14	-
Fresh headed and gutted/peeled	\$2.18	\$3.13
Frozen whole	\$1.49	\$3.11
Frozen fillet	\$1.43	-
Frozen cutlet	-	-
Frozen headed and gutted/peeled	-	\$3.26
Fresh prepared ready to cook	\$3.41	\$2.67
Frozen packaged ready to cook	\$1.23	\$2.34
Smoked	\$1.94	-
Canned	\$1.10	\$0.80
Glass bottle	\$0.83	-
Cooked fillet	\$2.06	-
Other	\$0.85	\$2.67

Note: those categories in which a price/serve has not been given have not been served frequently enough for reliable estimates of price/serve to be made.

Table 3.3.2.2: Average Price/Serve of Common Species of Fish Consumed In-Home

Species:	Price/Serve (\$)
Whiting	\$1.52
Shark	\$1.93
Bream	\$1.88
Snapper	\$2.16
Flathead	\$1.50
Orange roughy	\$2.84
Perch	\$2.82

Table 3.3.2.3: Average Price/Serve of Common Species of Seafood Consumed In-Home

Species:	Price/Serve (\$)
Prawns (whole)	\$3.39
Crab	\$1.56
Squid/calamari	\$2.27
Scallops	\$3.05

3.4 Some Factors Affecting Consumption In and Out-Of-Home

3.4.1 Consumption by Household Income and Number of Income Earners

Tables 3.4.1.1a and 3.4.1.1b show the *per capita* fish and seafood consumption figures derived from the 'In-Home' questionnaire according to household income. 22% of respondents either did not know or refused to provide details on their household income. Hence the figures for "all income groups" are just those of households for which income was given.

The results show that the lowest income group households had the highest average *per capita* consumption of fish and seafood in-home. However, for the out-of-home consumption known of by the grocery buyer, the highest income group's *per capita* consumption of fish and seafood was over double that of the lowest income group.

Tables 3.4.1.2a and 3.4.1.2b reveal that the number of household income earners also has some effect upon *per capita* consumption. Households with none or one income earner eat *per capita* more fish and approximately the same amount of seafood in-home as households with two or more income earners. On the other hand, grocery buyers from two or more income households eat *per capita* more fish and seafood out-of-home than those from none or one income households.

Table 3.4.1.1a: In-Home Consumption by Household Gross Income (\$'000)

	<i>per capita consumption (kg)</i>					
	Less than \$15 pa	\$15 - \$25 pa	\$25 - \$40 pa	\$40 - \$60 pa	\$60+ pa	All income groups
Fish in-home:						
Fresh	4.25	3.70	3.65	3.59	2.99	3.64
Frozen	0.67	0.53	0.49	0.76	0.30	0.55
Fish fingers	0.17	0.22	0.13	0.16	0.11	0.15
Other frozen packaged	0.30	0.17	0.22	0.17	0.31	0.23
Canned	1.77	1.31	1.37	1.37	1.26	1.41
Smoked	0.11	0.22	0.13	0.11	0.19	0.15
Cooked fillet eaten in-home	0.54	0.58	0.69	0.56	0.68	0.62
Other	0.17	0.23	0.30	0.14	0.09	0.20
Total fish in-home	7.97	6.96	6.97	6.86	5.93	6.95
Seafood in-home:						
Fresh	0.42	0.44	0.69	0.64	0.55	0.57
Frozen	0.04	0.08	0.15	0.17	0.12	0.12
Canned	0.02	0.03	0.04	0.13	0.04	0.05
Other	0.34	0.48	0.30	0.35	0.24	0.34
Total seafood in-home	0.82	1.02	1.17	1.30	0.94	1.08
Total fish & seafood in-home	8.79	7.98	8.14	8.16	6.87	8.02

Table 3.4.1.1b: Out-Of-Home Consumption Known of by the Grocery Buyer by Household Gross Income (\$'000)*

	<i>per capita</i> consumption (kg)					
	Less than \$15 pa	\$15 - \$25 pa	\$25- \$40 pa	\$40 - \$60 pa	\$60 + pa	All income groups
Fish out-of-home	0.96	1.18	1.11	1.84	1.93	1.33
Seafood out-of-home	0.48	0.52	1.03	1.31	1.95	1.00
Total fish & seafood out-of-home	1.44	1.70	2.14	3.15	3.88	2.33

** using the population of grocery buyers and children under 15 years as a base.
Not included is the consumption out-of-home of non-grocery buyers and that purchased (by non-grocery buyers) for children under 15 years.*

Table 3.4.1.2a: In-Home Consumption by Number of Household Income Earners

	<i>per capita consumption (kg)</i>		
	None/one	More than two	All households
Fish in-home:			
Fresh	4.24	3.52	3.88
Frozen	0.57	0.45	0.51
Fish fingers	0.16	0.14	0.15
Other frozen packaged	0.24	0.20	0.22
Canned	1.52	1.26	1.39
Smoked	0.16	0.10	0.13
Cooked fillet eaten in-home	0.62	0.55	0.59
Other	0.26	0.14	0.20
Total fish in-home	7.78	6.35	7.08
Seafood in-home:			
Fresh	0.55	0.66	0.60
Frozen	0.13	0.14	0.13
Canned	0.05	0.04	0.05
Other	0.32	0.32	0.32
Total seafood in-home	1.05	1.15	1.10
Total fish & seafood in-home	8.83	7.51	8.18

Table 3.4.1.2b: Out-Of-Home Consumption Known of by the Grocery Buyer by Number of Household Income Earners*

	<i>per capita</i> consumption (kg)		
	None/one	More than two	All households
Fish out-of-home	1.19	1.49	1.32
Seafood out-of-home	0.73	1.37	1.00
Total fish & seafood out-of-home	1.92	2.86	2.32

* using the population of grocery buyers and children under 15 years as a base. Not included is the consumption out-of-home of non-grocery buyers and that purchased (by non-grocery buyers) for children under 15 years.

3.4.2 Consumption by Religious Group

As Tables 3.4.2.1a and 3.4.2.1b show, the Jewish/Non-Christian group had the highest *per capita* consumption of fish and seafood in-home, while the lowest out-of-home. Not shown in the Table, the Jewish/Non-Christian group had a particularly high *per capita* in-home consumption of fresh whole fish at 2.94kg, well over double that of any other group. Similarly, their in-home consumption of fresh whole seafood was significantly higher *per capita* than any other group.

The Atheist/No Religion group were the lowest *per capita* consumers in-home and the highest out-of-home.

**Table 3.4.2.1a: In-Home Consumption by Grocery Buyer
Religious Group**

	<i>per capita</i> consumption (kg)				
	Roman Catholic	Other Christian	Jew/Non Christian	Atheist/No Religion	All households
Fish in-home:					
Fresh	4.24	3.65	5.44	3.19	3.77
Frozen	0.35	0.53	0.85	0.59	0.50
Fish fingers	0.17	0.14	0.28	0.14	0.15
Other frozen packaged	0.17	0.26	0.22	0.19	0.22
Canned	1.44	1.51	0.57	1.10	1.40
Smoked	0.08	0.15	0.00	0.19	0.13
Cooked fillet eaten in-home	0.60	0.66	0.20	0.44	0.59
Other	0.21	0.22	0.54	0.10	0.20
Total fish in-home	7.26	7.11	8.11	5.93	6.96
Seafood in-home:					
Fresh	0.70	0.52	1.25	0.67	0.61
Frozen	0.19	0.10	0.10	0.14	0.13
Canned	0.04	0.04	0.34	0.05	0.05
Other	0.23	0.38	0.06	0.29	0.32
Total seafood in-home	1.16	1.04	1.74	1.15	1.11
Total fish & seafood in-home	8.42	8.15	9.86	7.08	8.07

**Table 3.4.2.1b: Out-of-Home *per capita* Consumption
Known of by the Grocery Buyer by Grocery Buyer
Religious Group***

	<i>per capita</i> consumption (kg)				
	Roman Catholic	Other Christian	Jew/Non Christian	Atheist None	All households
Fish out-of-home	1.11	1.41	0.65	1.46	1.32
Seafood out-of-home	0.83	0.98	0.47	1.27	0.98
Total fish & seafood out-of-home	1.94	2.39	1.12	2.73	2.30

** using the population of grocery buyers and children under 15 years as a base. Not included is the consumption out-of-home of non-grocery buyers and that purchased (by non-grocery buyers) for children under 15 years.*

3.4.3 Consumption by Household Composition

Tables 3.4.3.1a and 3.4.3.1b show that household composition does play a role in the type and amount of fish and seafood eaten in-home.

Single people living alone and married couples with no children had the highest *per capita* total fish and seafood consumption in-home and amongst the highest *per capita* fish and seafood consumption out-of-home. They also represent a total of 42.1% of all households, as given in Section 2.2.3. Singles living with other singles were almost the lowest *per capita* consumers of fish in-home but were the highest *per capita* consumers of both fish and seafood out-of-home. They represent 9.0% of all households.

Families with children had the lowest *per capita* consumption of fish and seafood in-home and out-of-home.

These results are similar to those drawn from the 1977 study.

Table 3.4.3.1a: In-Home Consumption by Household Composition

	<i>per capita</i> consumption (kg)							
	Single - living alone	Single - living with other singles	Married/de facto with no children	Married/de facto with children	Married/de facto - adult family members	Single parent with children	Single parent with adult family members	All households
Fish in-home:								
Fresh	4.82	3.15	5.32	3.16	3.82	3.01	2.66	3.99
Frozen	0.83	0.28	0.62	0.51	0.34	0.85	0.49	0.54
Fish fingers	0.11	0.11	0.05	0.23	0.04	0.44	0.07	0.16
Other frozen packaged	0.38	0.28	0.31	0.15	0.12	0.18	1.01	0.22
Canned	2.62	1.42	1.70	1.04	1.45	1.37	1.36	1.48
Smoked	0.04	0.10	0.36	0.10	0.07	0.06	0.13	0.14
Cooked fillet eaten in home	0.68	0.50	0.50	0.60	0.57	0.70	0.84	0.62
Other	0.47	0.19	0.28	0.22	0.07	0.06	0.06	0.21
Total fish in-home	9.96	6.04	9.13	6.01	6.49	6.67	6.63	7.37
Seafood in-home:								
Fresh	0.50	0.73	0.64	0.55	0.69	0.29	0.99	0.64
Frozen	0.10	0.13	0.19	0.15	0.03	0.24	0.17	0.14
Canned	0.03	0.00	0.04	0.05	0.08	0.05	0.03	0.05
Other	0.33	0.38	0.45	0.25	0.32	0.40	0.07	0.34
Total seafood in-home	0.96	1.24	1.32	1.01	1.13	0.98	1.26	1.17
Total fish and seafood in-home	10.92	7.28	10.45	7.01	7.61	7.65	7.89	8.55

Table 3.4.3.1b: Out-Of-Home Consumption Known of by the Grocery Buyer by Household Composition*

	<i>per capita consumption (kg)</i>							All households
	Single - living alone	Single - living with other singles	Married/de facto with no children	Married/de facto with children	Married/de facto - adult family members	Single parent with children	Single parent with adult family members	
Fish out-of-home	1.96	2.49	1.85	0.78	1.85	0.93	1.22	1.32
Seafood out-of-home	1.30	1.59	1.55	0.65	1.23	0.73	0.86	1.00
Total fish and seafood out-of-home	3.26	4.08	3.40	1.43	3.08	1.66	2.08	2.32

* using the population of grocery buyers and children under 15 years as a base. Not included is the consumption out-of-home of non-grocery buyers and that purchased (by non-grocery buyers) for children under 15 years

3.4.4 Consumption by Country of Origin

Tables 3.4.4.1a and 3.4.4.1b show fish and seafood consumption according to whether the 'In-Home' questionnaire respondent had an English speaking or non-English speaking background.

The results show that households in which the grocery buyer had a non-English speaking background (for convenience "non-English households") were significantly higher consumers of fish and seafood in-home than households in which the grocery buyer had an English speaking background (for convenience "English households"). Out-of-home consumption known by the grocery buyer was approximately the same for both groups.

Apart from the overall quantities of fish and seafood consumed in-home, the mix of fish and seafood was also different. Fresh and frozen fish made up 83%, by edible weight, of non-English household in-home consumption, compared to 57% of English households consumption. The equivalent figures for seafood were 86% and 60% respectively.

A further breakdown of in-home fresh fish consumption is shown in Table 3.4.4.2. It reveals a tendency for non-English households to prefer fish purchased in fresh-whole form compared to English households who overwhelmingly prefer the fresh-filleted form. There is not this difference for fresh seafood where the fresh-whole form is preferred by both groups.

Table 3.4.4.1a: Consumption Known of by the Grocery Buyer by English or Non-English Speaking Background

	<i>per capita consumption (kg)</i>		
	From an English speaking country or emigrated to Australia before 5 years old	Emigrated to Australia after 5 years from a non-English speaking country	All language backgrounds
Fish in-home:			
Fresh	3.34	6.59	3.66
Frozen	0.47	0.80	0.50
Fish fingers	0.16	0.10	0.15
Other frozen packaged	0.22	0.10	0.21
Canned	1.50	0.66	1.41
Smoked	0.14	0.08	0.14
Cooked fillet eaten in-home	0.64	0.19	0.60
Other	0.17	0.40	0.20
Total fish in-home:	6.64	8.91	6.86
Seafood in-home:			
Fresh	0.45	1.77	0.59
Frozen	0.13	0.22	0.14
Canned	0.04	0.09	0.05
Other	0.34	0.23	0.33
Total seafood in-home:	0.96	2.31	1.10
Total fish & seafood in-home:	7.60	11.22	7.96

Table 3.4.4.1b: Out-of-Home Fish and Seafood Consumption Known of by Grocery Buyer*

	<i>per capita</i> consumption (kg)		
	From an English speaking country or emigrated to Australia before 5 years old	Emigrated to Australia after 5 years from a non-English speaking country	All language backgrounds
Fish out-of-home	1.34	1.13	1.33
Seafood out-of-home	1.01	1.01	1.01
Total fish & seafood out-of-home	2.35	2.14	2.34

** using the population of grocery buyers and children under 15 years as a base.
Not included is the consumption out-of-home of non-grocery buyers and that purchased (by non-grocery buyers) for children under 15 years.*

Table 3.4.4.2: Form of Purchase of Fresh Fish for In-Home Consumption: Grocery Buyers from English or Non-English Speaking Backgrounds

	<i>per capita</i> Consumption (kg)	
	From an English speaking country or emigrated to Australia before 5 years old	Emigrated to Australia after 5 years from a non-English speaking country
Form of purchase:		
Fresh - whole	0.76	2.93
Fresh - fillet	2.40	2.72
Fresh - cutlet	0.09	0.33
Fresh - headed and gutted/peeled	0.03	0.22
Fresh - prepared ready to cook	0.05	0.39
Total fresh fish consumption	3.33	6.59

A point of note in interpreting these results is that the English households made up 89% of all those surveyed, which means they still account for most of the fish and seafood consumed (see Section 2.2.3). Nonetheless, this dominance would not be as pronounced in the overall volumes of *fresh* fish and seafood consumed, where non-English households have far higher *per capita* consumption.

Table 3.4.4.3 provides a more detailed examination of in-home *per capita* consumption in terms of the grocery buyer's country or region of origin.

Those households in which the grocery buyers emigrated to Australia after five years of age from Italy, Greece or Asia all had significantly higher in-home fish and seafood consumption than the average for "all language backgrounds" of 7.96kg given in Table 3.4.4.1a.

In contrast “Yugoslavian households” were below average in-home consumers of fish and seafood.

Table 3.4.4.3: In-Home Consumption by Selected Countries of Origin*

	<i>per capita consumption (kg)</i>			
	Italy	Greece	Asia	Yugoslavia
Fish In-Home:				
Fresh	7.20	10.75	7.04	3.96
Frozen	1.23	0.00	1.24	0.06
Fish fingers	0.12	0.06	0.06	0.00
Other frozen packaged	0.86	0.01	0.00	0.11
Canned	0.73	0.18	0.39	0.23
Smoked	0.00	0.00	0.00	0.00
Cooked fillet eaten in-home	0.95	0.00	0.23	0.27
Other	0.36	0.35	0.74	1.50
Total Fish in-home	11.45	11.34	9.70	6.13
Seafood In-Home:				
Fresh	3.20	1.42	3.44	0.23
Frozen	0.14	0.00	0.19	0.27
Canned	0.04	0.00	0.05	0.01
Other	0.20	0.29	0.07	0.02
Total Seafood in-home	3.59	1.71	3.74	0.52
Total Fish & Seafood In-Home	15.03	13.05	13.44	6.65

* emigrated to Australia after five years of age.

3.5 Consumption in Institutions

The *per capita* consumption figures for residents living in institutions were given in the Overview of Section 3. This Section analyses institutional consumption in some detail.

Table 3.5.1 outlines *per capita* consumption for residents of each type of institution surveyed. For hospitals and nursing homes the *per capita* consumption is calculated per bed as discussed in Section 2.3.2 and noted in the Table 3.5.1 footnote. All figures shown are in edible weight.

Per capita fish and seafood consumption was highest in prisons/youth centres though this did not include any seafood at all. The highest consumers of seafood were residents of residential schools/colleges.

The percentages shown in the brackets in the total column of Table 3.5.1 represent the proportion of each form of fish and seafood of the total edible weight of fish/seafood consumed in institutions. Fresh, frozen and canned fish together make up 73.4% of the weight of fish and seafood consumed in institutions.

Table 3.5.2 provides the *per capita* consumptions for the institutions within each State.

**Table 3.5.1: Fish and Seafood Consumption in Each
Type of Institution: kg Per Weighting Unit†**

	Total † (proportion % in brackets)	Hospitals/ Nursing Homes†	Residential Schools/ Colleges	Prisons/ Youth Centres	Defence	Welfare/ Charitable Homes
Number catered for*	319,474	197,438	39,941	13,749	61,235	7,111
Fish consumption:						
Fresh (kg)	0.96 (10.9%)	0.97	1.01	0.00	1.19	0.43
Frozen (kg)	4.60 (52.2%)	4.84	2.15	8.23	4.40	4.71
Prepackaged (kg)	0.91 (10.3%)	0.96	1.92	0.71	0.22	0.23
Canned (kg)	1.82 (20.7%)	2.25	1.27	0.99	1.06	0.78
Other (kg)	0.03 (0.3%)	0.05	0.00	0.00	0.00	0.01
Total fish all forms	8.28 (94.0%)	9.07	6.35	9.92	6.88	6.16
Seafood consumption:						
Fresh (kg)	0.04 (0.5%)	0.02	0.04	0.00	0.11	0.00
Frozen (kg)	0.44 (5.0%)	0.36	1.32	0.00	0.29	0.00
Other ** (kg)	0.05 (0.6%)	0.07	0.01	0.00	0.02	0.01
Total seafood all forms	0.53 (6.0%)	0.45	1.37	0.00	0.43	0.01
Total fish and seafood	8.81 (100.0%)	9.52	7.71	9.92	7.31	6.17

† per weighting unit as discussed in Section 2.3.2. For hospitals/nursing homes the weighting unit is number of beds

* refers to the number of beds in hospitals/nursing homes, number full time residents in residential colleges/boarding schools, welfare and charitable homes, prisons/youth centres; and number of regulars in Defence

** includes prepackaged, canned, glass bottle and other forms of seafood.

Table 3.5.2: Fish and Seafood Consumption in Institutions by State: kg Per Weighting Unit†

	Total	NSW	VIC	QLD	SA	WA
Number catered for*	319,474	127,991	80,619	61,649	28,889	20,326
Fish consumption:						
Fresh (kg)	0.96	0.68	2.52	0.23	0.00	0.17
Frozen (kg)	4.60	4.94	3.00	5.94	3.99	4.94
Prepackaged (kg)	0.91	1.26	0.29	0.76	0.76	1.92
Canned (kg)	1.82	2.38	1.52	1.14	1.68	1.65
Other (kg)	0.03	0.01	0.01	0.01	0.25	0.00
Total fish all forms	8.28	9.28	7.33	8.09	6.67	8.68
Seafood consumption:						
Fresh (kg)	0.04	0.05	0.01	0.07	0.00	0.00
Frozen (kg)	0.44	0.61	0.47	0.23	0.17	0.32
Other ** (kg)	0.05	0.08	0.02	0.02	0.00	0.13
Total all seafood forms	0.53	0.74	0.50	0.33	0.18	0.45
Total fish and seafood	8.81	10.02	7.83	8.42	6.85	9.13

† per weighting unit as discussed in Section 2.3.2. For hospitals/nursing homes the weighting unit is number of beds

* refers to the number of beds in hospitals/nursing homes, number full time residents in residential colleges/boarding schools, welfare and charitable homes, prisons/youth centres; and number of regulars in Defence

** includes prepackaged, canned, glass bottle and other forms of seafood.

4. Detailed Findings - In-Home Study

4.1 Fish/Seafood Meals Consumed In-Home

4.1.1 Proportion of In-Home Meals in which Fish or Seafood was Consumed in the Previous Seven Days

Respondents from fish and seafood consuming households were asked details of what meals they had consumed over the last seven days prior to being interviewed.

In addition to the standard three meals per day, two other meal-occasions were included to cover the possibility of additional meals or snacks consumed by the respondent or another household member or visitor. These two meal-occasions were referred to as “other self” or “other person” respectively (see Glossary of Terms). Hence, not only were the in-home meals of the respondent detailed but the in-home meals of all household members and visitors.

The “other self” and “other person” meals will be studied separately to the standard three meals per day since in most households they were not consumed.

Hence the total number of dinner, lunch and breakfast (D, L, B) meal-occasions possible in the surveyed regions was:

$$5,223,000 \text{ households} \times 7 \text{ days/week} \times 3 \text{ meal occasions/household/day} = 109,683,000 \text{ meal-occasions/week}$$

Of these occasions, 3.3% are those of non fish/seafood consuming households. Hence a total of 107,181,000 meal-occasions were “available” to fish/seafood consuming households.

Table 4.1.1.1 provides quantitative details of the household meals consumed in the week prior to the interview. In the column showing D, L, B meal data, of the 107,181,000 meals possible, only 84,722,000 were actually consumed in-home. Of these only 5,176,000 or 6.1% were fish/seafood meals. As shown in Table 4.1.1.1, this equates to on average, about one fish/seafood D, L, B, meal in-home per household per week.

The 1,253,000 “other self” and 1,033,000 “other person” meals consumed in-home per week represent, in total, only 2.6% of the 87,025,000 meals consumed in-home per week. Nonetheless, a relatively high proportion of “other person” meals (17.7%) are fish/seafood meals.

Figure 4.1.1.1 provides details on the D, L, B meals of the respondent to the ‘In-Home’ questionnaire. While out-of-home meals are discussed in other sections of this report, the Figure does illustrate the very minor place of fish/seafood in the diets of Australians.

Figure 4.1.1.1 shows that respondents actually consumed their D, L, B meals 94.6% of the time though fish and seafood meals made up a minor portion of these meals. Of the 101,367,000 D, L, B meals actually consumed by respondents in the last seven days, only 7,343,000 were fish/seafood meals or approximately 1 in 14.

Table 4.1.1.2 shows very little change in the proportion of respondents’ meals consumed in or out of home by season.

Table 4.1.1.1: In-Home Meals Consumed in the Previous Seven Days: All Households Surveyed

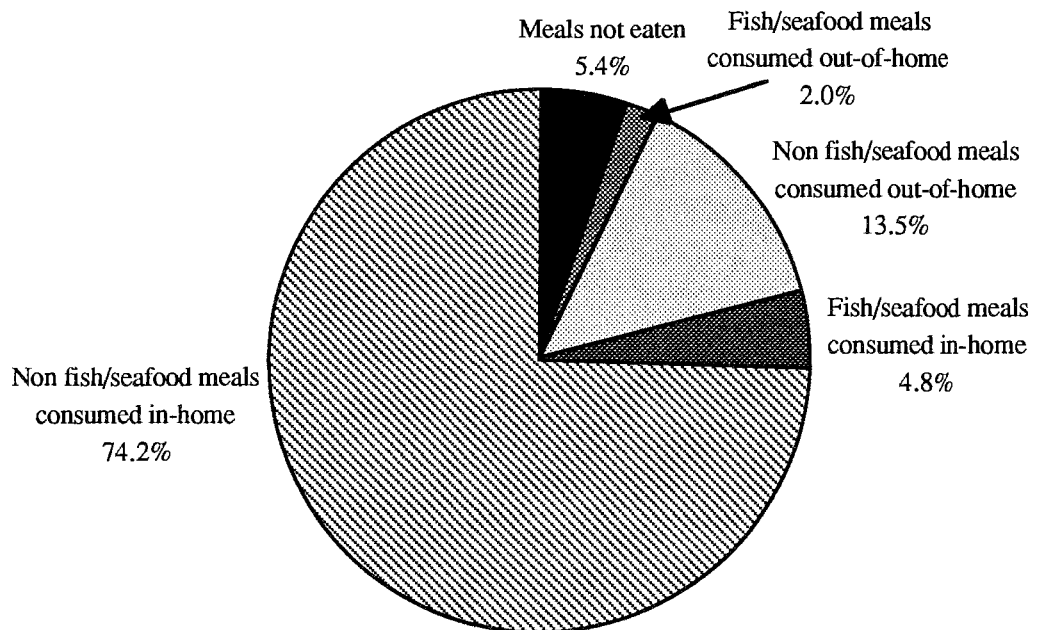
	D, L, B Meals	Other Self	Other Person	Total Meals
Weighted number of all households ('000)	5,223	5,223	5,223	5,223
Weighted number of fish and seafood consuming households ('000)	5,102	5,102	5,102	5,102
Total number of household (in-home) meals possible in the previous 7 days ('000)*	107,181	35,714	35,714	178,609
Total number of household (in-home) meals actually eaten in the previous 7 days ('000)*	84,722 (100%)	1,253 (100%)	1,033 (100%)	87,025 (100%)
Total number of household fish/seafood meal-occasions in the previous 7 days ('000)*	5,176 (6.1%)	87 (6.9%)	183 (17.7%)	5,447 (6.3%)
Total number of household fish/seafood meal-type-occasions in previous 7 days ('000)*	5,400	89	170	5658
Average number of in-home fish/seafood meal-occasions per week per household for:				
• all households	0.991	0.017	0.035	1.043
• fish/seafood consuming households	1.014	0.017	0.036	1.068
Average number of in-home fish/seafood meal-type-occasions per week per household for:				
• all households	1.034	0.017	0.033	1.083
• fish/seafood consuming households	1.058	0.017	0.033	1.109

** figures shown in these rows are for "fish/seafood consuming households" only.*

Table 4.1.1.2: Place of D, L, B Meal Consumption by Season - Respondents from Fish and Seafood Eating Households

	November 1990	February - March 1991	May - June 1991	August - September 1991
In-home	77.6%	78.7%	80.9%	79.0%
Out of home	16.2%	15.3%	14.7%	16.0%
Meals not eaten	6.2%	6.0%	4.4%	5.0%
Total	100.0%	100.0%	100.0%	100.0%

Figure 4.1.1.1: Proportion of D, L, B Meals in Which Fish/Seafood was Consumed: Respondents from Fish/Seafood Consuming Households



4.1.2 When In-Home Meals are Consumed

Table 4.1.2.1 provides a further breakdown into fish/seafood meals and non-fish/seafood meals of in-home D, L, B meals that were eaten. Fish/seafood meals in-home are most common at dinners and are most uncommon at breakfasts. 12.4% of weekday dinners are fish/seafood meals versus 9.4% of weekend dinners. Overall, a slightly higher proportion of weekday D, L, B meals are fish/seafood meals than weekend meals.

The equivalent data for in-home “other self” and “other person” meals is given in Table 4.1.2.2. A relatively high proportion of meals prepared by the respondent for “other persons” were fish and seafood meals, especially on weekdays.

Table 4.1.2.1: Proportion of Respondents’ In-Home D, L, B Meals Eaten in Which Fish/Seafood was Eaten: Weekdays and Weekends

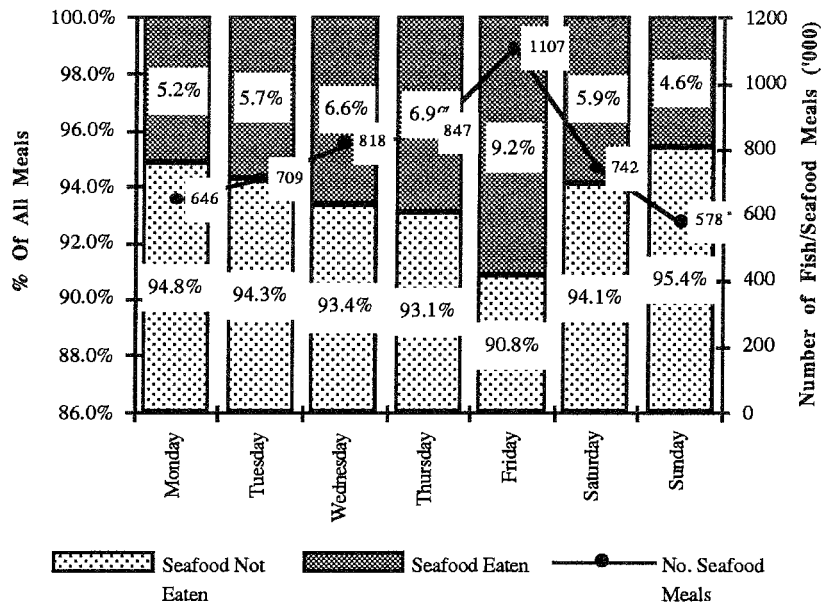
	Weekday (M - F)				Weekend (S - S)				Total D,L,B all days
	D	L	B	Total weekly D L B	D	L	B	Total week-end D L B	
Fish/seafood eaten % ('000 meals)	12.4% 2787	6.6% 1024	0.5% 115	6.5% 3926	9.4% 764	5.6% 435	0.6% 52	5.1% 1250	6.1% 5176
Fish/seafood not eaten % ('000 meals)	87.6% 19665	93.4% 14513	99.5% 22071	93.5% 56250	90.6% 7337	94.4% 7266	99.4% 8691	94.9% 23293	93.9% 79564
Total % ('000 meals)	100% 22452	100% 15537	100% 22186	100% 60176	100% 8101	100% 7701	100% 8743	100% 24,544	100% 84740

Table 4.1.2.2: Proportion of Respondents' In-Home "Other Self", "Other Person" Meals Eaten in which Fish/Seafood was Consumed

	Weekday		Weekend		Total
	Other Self	Other Person	Other Self	Other Person	
Fish/seafood eaten % ('000 meals)	6.8% 59	19.2% 142	7.2% 28	14.1% 41	11.8% 270
Fish/seafood not eaten % ('000 meals)	93.2% 809	80.8% 598	92.8% 357	85.9% 252	88.2% 2016
Total % ('000 meals)	100% 868	100% 740	100% 385	100% 293	100% 2286

Figure 4.1.2.1 presents respondents' (from fish/seafood households) consumption of fish/seafood meals by day of the week. It shows that household fish and seafood meals peak on Friday, probably a reflection of religious convictions and tradition.

Figure 4.1.2.1: In-home Consumption by Day of Week: Respondents from Fish/Seafood Consuming Households (all D, L, B, "Other Self", "Other Person" Meals)



4.1.3 The Number of People Eating at In-Home Fish/Seafood Meals

Sections 4.1.1 and 4.1.2 studied the proportion of *respondent meal-occasions* that were fish or seafood meals by virtue of respondent's position as the household's main food preparer.

This Section examines the people who actually consumed these meals, including the respondent. Hence the number of "people-meals" are studied rather than respondent or household meals. Table 4.1.3.1 draws the distinction in the survey results.

Table 4.1.3.1: Fish or Seafood Meals Consumed in the Home: Average Number of Serves

	All D, L, B meals	Weekday				Weekend			
		D	L	B	Total	D	L	B	Total
Number of fish/seafood meal-occasions	5,176	2,787	1,024	115	3,926	764	435	52	1,250
Total number of fish/seafood serves eaten by household members	11,354	6,739	1,620	151	8,510	1,852	899	94	2,844
Total number of fish/seafood serves eaten by visitors	1,038	399	103	0	511	388	141	2	534
Total number of fish/seafood serves (all people)	12,392	7,138	1,723	151	9,021	2,240	1,040	96	3,378
Average number of fish/seafood serves per meal-occasion	2.39	2.56	1.68	1.31	2.30	2.93	2.39	1.85	2.70

Hence an average of 2.39 people consume fish and seafood on any D, L, B household fish/seafood meal-occasion. This is somewhat less than the average number of occupants per household of 2.82. However, household lunches do not often involve the entire family, especially on weekdays.

The very low 1.31 people per fish and seafood meal for weekday breakfasts suggests most of those who consume fish or seafood at breakfast do so themselves, without being joined by other family members.

Table 4.1.3.2 shows the relative contribution of each sex and age group to the consumption of fish or seafood meals in the home. Comparison is made with the relative contribution of each sex and age group to the weighted sampled population.

The results show a distinctive pattern - namely that both males and females in all age groups under 39 years are, on average, less frequent consumers of fish/seafood in-home than people over 39 years old. This is particularly marked for females in the 40 to 59 year old age group who consume 14.3% of all in-home fish or seafood meals, yet account for only 12.0% of the total sampled population.

Table 4.1.3.2: Proportion of In-Home Fish/Seafood Serves Eaten by Each Age Group in the Last Seven Days (Not Including Visitors)

Age Group	Male		Female	
	% of Meals Consumed*	% of Total Population	% of Meals Consumed*	% of Total Population
0 - 2 Years	1.2%	1.7%	1.1%	1.8%
3 - 9 Years	4.5%	4.6%	4.0%	4.6%
10 - 14 Years	2.7%	3.2%	2.6%	3.0%
15 - 19 Years	3.0%	3.9%	3.3%	4.1%
20 - 39 Years	14.2%	17.1%	15.2%	16.1%
40 - 59 Years	11.9%	11.5%	14.3%	12.0%
60+ Years	9.7%	7.4%	11.6%	8.9%
Refused	0.0%	0.0%	0.0%	0.1%
All age groups	47.2%	49.5%	52.0%	50.5%

* 0.8% of all fish/seafood serves could not be assigned to an age group.

4.2 Product Usage by Occasion, Season, Species, Type and Form of Fish or Seafood

4.2.1 Form of Fish and Seafood Eaten In-Home by Meal-Occasion

Respondents to the 'In-Home' questionnaire who had consumed fish/seafood in-home in the previous seven days were asked to provide details of the form in which the fish/seafood was purchased. Section 2.4 provides the list of forms used in this question.

Table 4.2.1.1 provides the top five most frequently mentioned forms of fish purchased by the meal-occasion at which it was consumed. Note that the number of meal-type-occasions shown in the Table do not necessarily correspond to the number of purchases, since one fish purchase could be used for more than one fish meal-type-occasion.

Table 4.2.1.1: Form of Fish Purchase by In-Home Meal-Occasion Consumed: Meal-Type-Occasions ('000s and as a Proportion, %)

Rank	*All Meals	Dinner	Lunch	Breakfast
1	Canned (1690) (35.2%)	Fresh fillet (1056) (33.6%)	Canned (888) (67.1%)	Canned (57) (40.0%)
2	Fresh fillet (1229) (25.6%)	Canned (635) (20.2%)	Fresh fillet (141) (10.7%)	Glass bottle (314) (23.8%)
3	Fresh whole (531) (11.0%)	Fresh whole (426) (13.5%)	Fresh whole (91) (6.9%)	Frozen fillet (11) (7.7%)
4	Cooked fillet (363) (7.6%)	Cooked fillet (294) (9.3%)	Cooked fillet (55) (4.2%)	Fresh fillet (10) (7.0%)
5	Frozen packaged ready to cook (312) (6.5%)	Frozen packaged ready to cook (251) (8.0%)	Frozen fillet (32) (2.4%)	Frozen packaged ready to cook (9) (6.3%)
All other forms	(682) (14.2%)	(483) (15.4%)	(116) (8.8%)	(22) (15.4%)
All forms	4807 100%	3145 100%	1323 100%	143 100%

* including "other person" and "other self" meals in-home.

Canned fish comprise 35.2% of all fish in-home meal-type-occasions and are the most often consumed form of fish at lunches and breakfasts. Fresh fillet is the most commonly eaten form of fish at in-home dinners.

The top five forms of purchase for dinner and lunch meals are the same with only changes in the position of the two highest ranked forms. Breakfast meals see the inclusion of glass bottle and frozen fillet forms within the top five.

Not shown in Table 4.2.1.1 are “other self” and “other person” in-home fish meals which account for 61,000 and 135,000 in-home fish meal-type-occasions per week respectively. The most common forms of purchase for these meals are canned followed by fresh fillet, frozen packaged ready to cook and cooked fillet.

The forms of purchase of seafood consumed in-home showed no dependence upon meal-occasion. Table 4.2.1.2 therefore, shows the most popular forms for all in-home seafood meal-type-occasions.

Table 4.2.1.2: Form of Seafood Purchased for In-Home Consumption: Meal-Type-Occasions (000's and as a Proportion, %)

Rank	*All Meals	
1	Fresh whole	(301) (35.3%)
2	**Other	(286) (33.5%)
3	Canned	(56) (6.5%)
4	Fresh headed and gutted/peeled	(41) (4.8%)
	All other forms	(169) (19.8%)
	All forms	853 100%

* includes dinner, lunch, breakfast, “other self”, “other person” meal-occasions in-home

** includes mainly cooked seafood, seafood used as an ingredient in take-away meals and crumbed seafood.

Figures 4.2.1.1, 4.2.1.2, 4.2.1.3 and 4.2.1.4 (see pie charts after the tables) illustrate some of the changes in the forms of fish and seafood purchased for in-home consumption since 1977.

Fresh and frozen fish's share of in-home fish meals has increased at the expense of canned fish, fish fingers and smoked fish (Figures 4.2.1.1 and 4.2.1.2).

Fresh and frozen forms of seafood still have the largest share (51.2%) of in-home seafood meals. "Other" forms (ie, cooked, used as ingredient in take-away meals and crumbed) appear to have gained 38% of in-home seafood meals at the expense of canned seafood. However, some caution must be exercised in comparing the 1977 and 1990/91 data - 1990/91 data includes take-away meals (bought from fish and chip shops and take-away outlets) that were eaten in-home, while 1977 data did not include this form of consumption (see Section 2.6). Nonetheless, there has still been a significant decline in canned seafood's relative share of in-home seafood meals.

Tables 4.2.1.3 and 4.2.1.4 reproduce tables in the 1977 study report and compare the equivalent figures from the 1990/91 survey. They present the same data shown in Tables 4.2.1.1 and 4.2.1.2 from a slightly different perspective to match the form of presentation in the 1977 report.

Each column presents all the meal-type-occasions for a particular form of purchase by the meal-occasion at which served. Hence, in 1990/91, 83.8% (1,817,000 per week) of all in-home fresh and frozen fish meal-type-occasions were served at dinner. This compares with 79.8% in 1977. In fact, dinners are the most common meal-occasion at which all forms of fish (Table 4.2.1.3) and seafood (Table 4.2.1.4) are consumed with the exception of canned fish. In the case of canned fish, there has been a shift from lunch time consumption to dinner time consumption since 1977, though lunch meals still represent 52.5% of canned fish meals versus 61.3% in 1977.

Table 4.2.1.3 Meal at Which Each Form of Fish was Consumed In-Home 1977 Versus 1990/91
('000s Meal-Type-Occasions and as a Proportion, %)**

	Totals all forms		Fresh and frozen		Fish fingers		Other frozen packaged		Canned		Smoked		Cooked Fillet		Other	
	1977	'90/91*	1977	'90/91	1977	'90/91	1977	'90/91	1977	'90/91	1977	'90/91	1977	'90/91	1977	'90/91*
Breakfast	157	143	33	30	36	7	5	2	65	57	15	7	NA	1	3	39
	5.2%	3.0%	3.5%	1.4%	8.9%	5.3%	4.5%	1.1%	4.5%	3.4%	14.3%	9.0%	NA	0.3%	9.7%	19.8%
Lunch	1196	1323	154	285	106	22	17	13	883	888	23	14	NA	55	13	47
	39.4%	27.5%	16.4%	13.1%	26.3%	16.5%	15.0%	7.0%	61.3%	52.5%	21.8%	17.9%	NA	15.2%	38.2%	24.0%
Dinner	1592	3145	751	1817	255	92	89	159	419	635	62	52	NA	294	16	96
	52.4%	65.4%	79.8%	83.8%	63.0%	69.2%	78.5%	89.1%	29.1%	37.5%	59.0%	66.7%	NA	81.0%	46.1%	49.4%
Other self	94	61	3	8	8	3	2	1	74	38	5	2	NA	1	2	8
	3.1%	1.3%	0.4%	0.4%	2.3%	0.6%	0.6%	0.6%	5.1%	2.2%	2.6%	2.6%	NA	0.3%	6.0%	4.1%
Other person	135	135	29	29	9	9	4	4	73	73	3	3	NA	12	5	5
	2.8%	2.8%	1.3%	1.3%	6.8%	6.8%	2.2%	2.2%	4.3%	4.3%	3.8%	3.8%	NA	3.3%	2.7%	2.7%
Total	3040	4807	942	2169	406	133	113	179	1440	1690	104	78	NA	363	35	195
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	NA	100.0%	100.0%	100.0%

* includes cooked fillet fish and "other" forms of fish purchased as a take-away meal eaten in-home which is not in 1977 data. Hence comparison 1990/91 versus 1977 not strictly valid.

** Note: the 1977 study covered the 7 capital cities apart from Darwin. The 1990/91 study included, in addition, 7 regional areas within these same states.

Note: NA means not available since the 1977 study did not split cooked fillet consumption by whether it was consumed in-home or out-of-home.

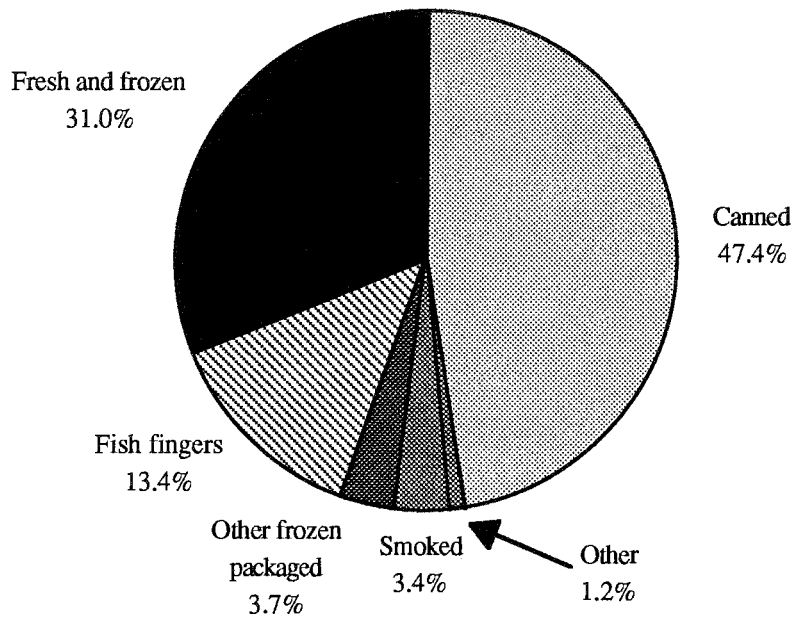
Table 4.2.1.4 Meal at which Each Form of Seafood was Consumed In-Home 1977 Versus 1990/91:
('000s Meal-Type-Occasions and as a Proportion, %)**

	Totals all forms		Fresh and Frozen		Frozen Packaged		Canned		Other	
	1977	'90/91*	1977	'90/91	1977	'90/91	1977	'90/91	1977	'90/91*
Breakfast	2	11	1	8	0	0	1	1	1	2
	0.5%	1.3%	0.3%	1.8%	0.0%	0.0%	1.0%	1.8%	0.6%	0.7%
Lunch	103	165	59	87	6	6	32	9	6	62
	23.3%	19.3%	23.2%	19.9%	16.2%	17.6%	23.8%	16.4%	32.8%	19.2%
Dinner	271	613	176	326	26	29	62	25	6	233
	60.9%	71.9%	68.8%	74.6%	75.9%	79.4%	46.1%	45.6%	33.1%	71.8%
Other self		29		7		0		11		11
Other person	68	3.4%	20	1.6%	3	0.0%	39	19.9%	6	3.4%
	15.3%	35	7.7%	9	8.0%	1	29.1%	9	33.5%	16
		4.1%		2.1%		3.0%		16.3%		4.9%
Total	445	853	255	437	35	36	136	56	19	324
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

* includes seafood purchased as a take-away meal from fish and chip shops and take-aways. This seafood is not included in 1977 data and hence comparison not valid.

** Note: the 1977 study covered the 7 capital cities apart from Darwin. The 1990/91 study included, in addition, 7 regional areas within these same states.

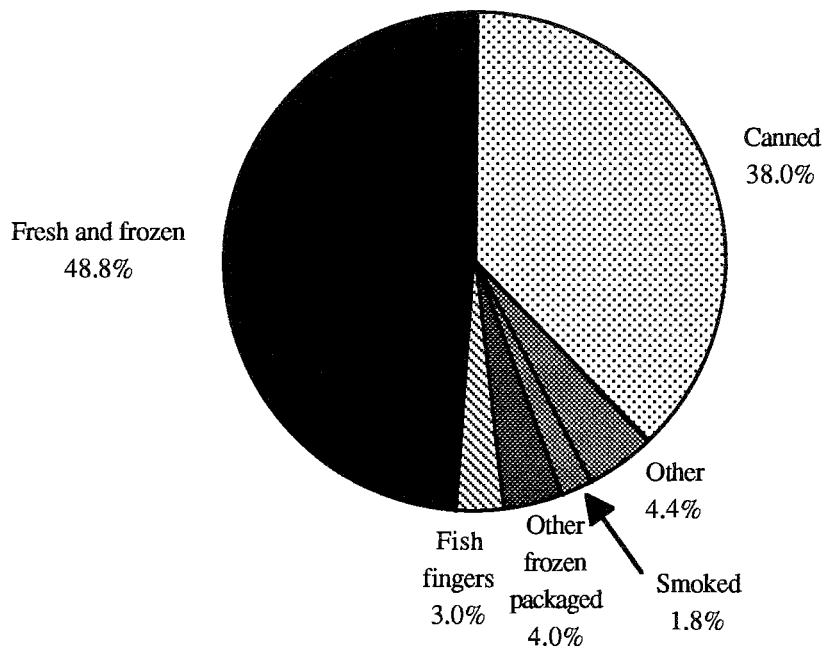
Figure 4.2.1.1: The Forms of Purchase of Fish Consumed In-Home (excluding cooked fillets*),1977: Proportion of Total Meal-Type-Occasions



Base: 3,040,000 in-home fish meal-type-occasions

* the place of consumption of cooked fillets was not specified in 1977.

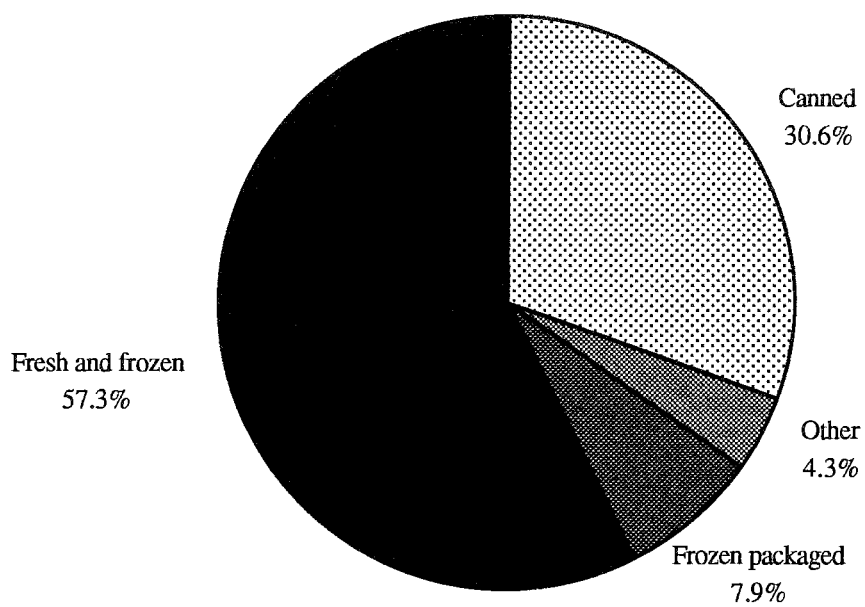
Figure 4.2.1.2: The Forms of Purchase of Fish Consumed In-Home (excluding cooked fillets*), 1990/91: Proportion of Total Meal-Type-Occasions



Base: 4,444,000 in-home fish meal-type-occasions

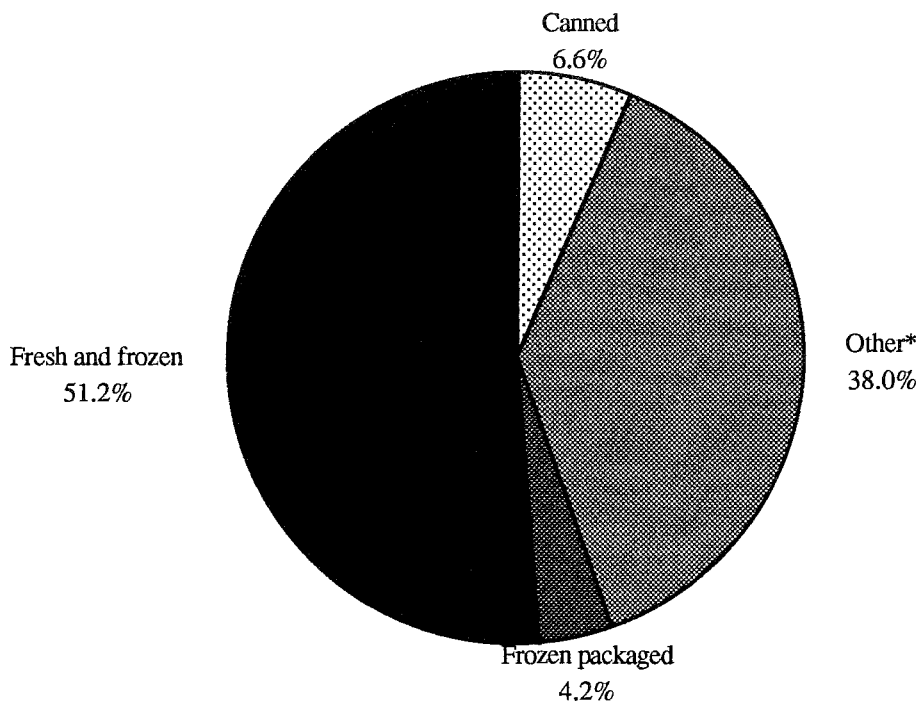
* the place of consumption of cooked fillets was not specified in 1977.

Figure 4.2.1.3: The Forms of Purchase of Seafood Consumed In-Home, 1977: Proportion of Total Meal-Type-Occasions



Base: 445,000 in-home seafood meal-type-occasions

Figure 4.2.1.4: The Forms of Purchase of Seafood Consumed In-Home, 1990/91: Proportion of Total Meal-Type-Occasions



Base: 853,000 in-home seafood meal-type-occasions

* includes mainly cooked seafood, seafood used as an ingredient in take-aways.

4.2.2 Species/Types of Fish or Seafood Eaten by Season

It can be seen from Table 4.2.2.1 that the mix of fish or seafood types consumed in the home changes with season. For example, canned fish or seafood was more commonly eaten in November and March, perhaps reflecting the use of canned fish/seafood with salads in these seasons. More importantly, the total number of fish/seafood in-home meal-type-occasions in the bottom row of the Table shows significant seasonal variation with a peak in November/March and a low in September.

Table 4.2.2.1: Type of Fish or Seafood Eaten In-Home by Season: D, L, B, "Other Self", "Other Person", Meal-Type-Occasions

	Nov 1990	Mar 1991	Jun 1991	Sept 1991
Fish*	43.0%	40.4%	45.5%	45.1%
Seafood*	11.0%	12.7%	9.6%	13.2%
Processed products	4.4%	5.5%	4.8%	4.7%
Catering products	0.6%	0.6%	0.4%	0.4%
Bottles/plastic cups/pouches	1.6%	2.0%	1.3%	1.4%
Canned	32.1%	32.7%	30.5%	29.1%
Other fish and seafood	7.5%	6.2%	7.9%	6.3%
Total no of fish/seafood meal-type-occasions in last 7 days	(100%) 5,952,000	(100%) 6,089,000	(100%) 5,478,000	(100%) 5,117,000

* only fresh, frozen, smoked, cooked forms of fish and seafood. See Appendix V listing of fish/seafood types used above.

The most commonly used species of fish do vary by season, though whiting, shark and snapper always constitute the three most common species apart from in June when snapper drops out of the top five species (Table 4.2.2.2).

**Table 4.2.2.2: Most Commonly Used Species of Fish†
for In-Home Meals by Season: all Meal-Type-Occasions.**

Rank	Nov 90	March 91	June 91	Sept 91
1	Whiting (293)	Whiting (254)	Whiting (245)	Shark (256)
2	Shark (269)	Shark (228)	**Bream (231)	Whiting (221)
3	Snapper (199)	Snapper (222)	Shark (213)	Snapper (182)
4	*O. Roughy (150)	**Bream (178)	Flathead (173)	*O. Roughy (181)
5	*Perch (106)	Flathead (151) *O. Roughy (127) *Perch (86)	*O. Roughy (160)	**Bream (167) *Perch (100)

Note: 1) in brackets is number of meal-type-occasions in last 7 days ('000)

2) * on the basis of catch statistics it is suspected that a significant portion of perch mentions were actually orange roughy. This would boost the ranking of orange roughy in all seasons.

3) ** on the basis of catch statistics most of the bream mentions are suspected of being morwong

† only fresh, frozen, smoked, cooked forms of fish. See Appendix V.

The top three seafood species consumed in-home are always whole prawns, squid/calamari and crabs (Table 4.2.2.3). By the actual numbers of respondent meals consumed (figures in brackets), whole prawns dominate the seafood types and are more popular than any of the fish types. Whole prawns clearly have a special place in the in-home meal market.

The ranking of the three most popular varieties of canned fish and seafood available does not change with season. Average ranking and number of respondent meals are given in Table 4.2.2.4.

Table 4.2.2.3: Most Commonly Used Species of Seafood† for In-Home Meals by Season: all Meal-Type-Occasions

Rank	Nov 90	March 91	June 91	Sept 91
1	Prawns (whole) (387)	Prawns (whole) (444)	Prawns (whole) (324)	Prawns (whole) (388)
2	Squid/Calamari (52)	Crabs (88)	Squid/Calamari (39)	Squid/Calamari (71)
3	Crabs (38)	Squid/Calamari (47)	Crabs (38)	Crabs (63)
4	Crayfish/Lobster (38)	Scallops (41)	Mussels (26)	Scallops (48)
5	Scallops (36)	Crayfish/Lobster (31)	Oysters (22)	Seafood extender (25)

*Note: in brackets is number of meal-type-occasions last 7 days ('000)
† only fresh, frozen, smoked, cooked forms of fish. See Appendix V.*

Table 4.2.2.4: Most Commonly Used Types of Canned Fish/Seafood for In-Home Meals - Average of all Season Responses: all Meal-Type-Occasions

Rank	Canned
1	Tuna (813)
2	*Salmon - other (573)
3	Sardines (210)
4	Anchovies (34)
5	Herring fillets (22)
6	Oysters (22)
7	Prawns (19)

*Note: in brackets is number of meals-type-occasions last 7 days ('000)
* treated separately was Australian salmon which received 17,000 mentions though most of mentions in "salmon - other" did not specify country of origin.*

4.2.3 Species/Types of Fish and Seafood Consumed In-Home

When asked what species or type of fish/seafood they had consumed in-home in the previous seven days, respondents were unable to give names of species or types for, on average, 6.0% of fish/seafood meals for that week. This 6.0% was made up of mostly:

- fresh, frozen or pre-cooked fish fillets or
- frozen packaged ready to cook fish and seafood.

Respondents were more likely to know the species/type of seafood they had consumed than was the case for fish.

Closest equivalent data from the 1977 study shows:

- for fish consumed in-home except pre-cooked fish, 2% of respondents did not know the species/type
- for pre-cooked fish purchased from a fish and chip shop/take-away eaten in or out-of-home, 16% of respondents did not know the species/type.

Therefore, it appears on balance, that respondents had as much difficulty in knowing fish and seafood species/types in 1990/91 as in 1977.

The various fish and seafood species and types that were ranked most commonly consumed in-home in 1977 were not necessarily as commonly consumed in 1990/91 as Table 4.2.3.1 shows. Orange roughy and perch, shark, trevally, blue grenadier and trout were amongst the top 11 species of fresh and frozen fish consumed in-home in 1990/91, though they were not in 1977. These species have joined the top 11 at the expense of fresh and frozen forms of flounder, salmon, herrings, sardines and tuna which no longer appear in the 1990/91 top 11 species, though they did in 1977.

The rapid acceptance of orange roughy/perch and shark by Australian consumers is the most important point made by Table 4.2.3.1.

Tables 4.2.3.2 and 4.2.3.3 compare the most commonly consumed frozen packaged (ready to cook) fish and canned fish species/types, 1977 versus 1990/91 respectively. Crumbed fish fillets were the most popular types of frozen packaged (ready to cook) fish in 1990/91 while this type did not receive a mention in 1977. In canned fish, tuna had a higher proportion of in-home canned fish meals in 1990/91 versus 1977. Canned sardines and herring have waned in popularity since 1977.

It is interesting to compare the proportion of frozen packaged (ready to cook) fish meal-type-occasions for which the species/type of fish wasn't known (15.8%) versus that for canned fish (0.9%). Canned fish is obviously marketed with heavy emphasis on the species.

Table 4.2.3.4 shows that smoked salmon took a relatively larger share of in-home smoked fish meals in 1990/91 than was the case in 1977. However smoked cod was still the mainstay of smoked fish in-home meals.

One third of cooked fish meals purchased from take-aways/fish and chip shops and eaten in-home were shark in 1990/91 (Table 4.2.3.5). The term flake used for shark in 1977 has dropped out of common usage. Orange roughy and perch, and mackerel joined the eight most commonly purchased species in 1990/91 at the expense of flathead and flounder which were listed in 1977. The evident uncertainty of many respondents in recalling the species they had consumed is reflected in the 17.2% of cooked fish meal-occasions for which "don't know" was recorded. This is on par with results of the 1977 study.

Prawns were even more dominant in in-home seafood meals in 1990/91 than was the case in 1977. Squid/calamari gained a larger share of seafood meals in 1990/91 while oysters and canned oysters had “nosedived” in terms of seafood meal share. Oysters and smoked oysters together accounted for 25% of in-home seafood meals in 1977 compared to oysters and canned oysters accounting for only 4.7% in 1990/91.

Table 4.2.3.1: Most Commonly Consumed Species of Fish In-Home Purchased in Fresh or Frozen* Form 1977 Versus 1990/91: % of Meal-Type-Occasions

Rank	1977		1990/91	
1	Bream	11.3%	Orange roughy and perch**	10.7%
2	Snapper	11.0%	Whiting	9.5%
3	Flathead	10.6%	Bream	7.4%
4	Whiting	10.2%	Snapper	6.7%
5	Flounder	6.6%	Flathead	6.5%
6	Mullet	6.3%	Shark	5.3%
7	Cod	2.6%	Mullet	4.1%
8	Salmon	1.0%	Trevally	3.2%
9	Herrings	0.9%	Blue Grenadier	2.6%
10	Sardines	0.8%	Trout	2.4%
11	Tuna	0.7%	Cod	2.4%
12	Other fish	38.0%	Garfish	2.1%
13			Mackerel	2.1%
14			Dory	1.8%
			Don't know	7.5%
			Other known species	25.7%
Total		100%		100%

* does not include frozen packaged and fish fingers

** on the basis of catch statistics most of the perch mentioned in 1990/91 are suspected to be orange roughy - hence they have been combined for the sake of gauging popularity, ie 4.1% perch and 6.6% orange roughy = 10.7%.

Table 4.2.3.2: Common Species/Types of Frozen Packaged (Ready to Cook) Fish Consumed In-Home 1977 Versus 1990/91: % Meal-Type-Occasions (Excludes Fish Fingers)

Rank	1977		1990/91	
1	Whiting	35.3%	Crumbed fish fillet and chips	11.2%
2	Flounder	23.8%	Crumbed oven fry fish	9.9%
3	Cod	12.9%	Whiting	5.9%
4	Snapper	2.1%	Fish cakes	2.6%
5	Flathead	1.8%	Fish fillets in sauce	2.0%
	Other fish species/ types	24.1%	Other fish species/types	52.6%
	NA		Don't know	15.8%
Total		100%		100%

Table 4.2.3.3: Common Species/Types of Canned Fish Consumed In-Home: 1977 Versus 1990/91: % Meal-Type-Occasions

Rank	1977		1990/91	
1	Tuna	38.1%	Tuna	48.0%
2	Salmon	34.8%	Salmon	34.3%
3	Sardines	16.1%	Sardines	12.3%
4	Herrings	2.8%	Herrings	1.3%
5	NA		Anchovies	1.2%
	Others	8.2%	Others	2.0%
			Don't know	0.9%
Total		100%		100%

Table 4.2.3.4: Common Species/Types of Smoked Fish Consumed In-Home 1977 Versus 1990/91: % Meal-Type-Occasions

Rank	1977		1990/91	
1	Cod	47.1%	Cod	41.2%
2	Herrings	5.8%	Salmon	25.0%
3	Salmon	4.1%	Trout	5.0%
4	Mullet	1.1%	-	
5	-		Don't know	6.2%
	Others	41.9%	Others	22.6%
Total		100%		100%

Table 4.2.3.5: Common Species of Cooked Fish Purchased from Take-Away Outlets: 1977* Versus 1990/91: % of Meal-Type-Occasions**

Rank	1977*		1990/91**	
1	Flake	27.0%	Shark	31.9%
2	Bream	12.1%	Cod	6.4%
3	Snapper	10.9%	Snapper	6.4%
4	Whiting	7.6%	Whiting	6.1%
5	Butterfish	4.7%	Butterfish	5.3%
6	Flathead	4.0%	Bream	3.3%
7	Flounder	2.8%	Orange roughy and perch	3.3%
8	Cod	2.4%	Mackerel	2.8%
	Other fish	12.3%	Other fish	17.4%
	Don't know	16.1%	Don't know	17.2%
Total		100%		100%

* includes all purchases of cooked fish whether consumed in or out-of-home

** only includes those cooked fish meal-type-occasions that were consumed in-home.

Table 4.2.3.6: Common Species/Types of Seafood (All Forms) Consumed In-Home: 1977 Versus 1990/91: % Meal-Type-Occasions

Rank	1977		1990/91	
1	Prawns	38.8%	Prawns (whole)	44.4%
2	Oysters	14.3%	Crabs	6.6%
3	Smoked oysters	10.7%	Squid/calamari	5.7%
4	Crabs	7.5%	Scallops	4.2%
5	Crayfish/lobster	6.1%	Oysters	3.0%
6	Mussels	5.3%	Crayfish/lobster	3.0%
7	Scallops	4.2%	Canned oysters	2.5%
8	Seafood cocktail	4.1%	Canned prawns	2.2%
9	Squid	3.2%	Shrimp - cooked and peeled	1.7%
			Don't know	5.0%
	Other seafood	5.8%	Other seafood	21.7%
Total		100%		100%

Note: The 1977 figures above do not include cooked seafood purchased from take-aways/fish and chip shops while the 1990/91 figures do.

Tables 4.2.3.7 and 4.2.3.8 detail the species of fish and seafood consumed in the home across all regions surveyed.

Table 4.2.3.9 a and b summarise the results of these tables by listing the most popular species by region. As shown in all tables, considerable differences exist in the species of fish and to a lesser extent, seafood, consumed across regions. This is largely related to where the major catch of a particular species is landed. For example, the catch of shark in the Southern Shark Fishery is largely distributed through Melbourne, hence this is the most popular species consumed in-home in Melbourne households. Tasmania is the centre of the orange roughy catch industry, as reflected in the popularity of this species in Hobart and regional Tasmanian households. Respondents did not know the type of fish/seafood consumed in 6.1% of all in-home fish and seafood meal-type-occasions.

Table 4.2.3.7: Species of Fish Consumed In-Home in Each Region: Proportion of Total Fish Meal-Type-Occasions (Not Including Canned/Processed Fish)

Fish	Total	Syd	Reg NSW	Mel	Reg Vic	Bris	Reg QLD	Adel	Reg SA	Per	Reg WA	Canb	Hob	Reg TAS
Barramundi	1.5%	0.2%	0.0%	0.2%	0.0%	0.5%	10.4%	1.2%	0.0%	4.3%	3.0%	3.3%	0.0%	0.0%
Bream	7.6%	18.2%	13.6%	1.4%	1.9%	9.8%	7.0%	2.5%	1.2%	1.4%	0.0%	16.7%	0.0%	0.0%
Butterfish	1.6%	0.0%	0.0%	0.4%	2.5%	0.0%	0.5%	14.9%	8.2%	0.0%	1.5%	0.0%	0.0%	0.0%
Blue grenadier	2.4%	0.4%	0.0%	7.4%	8.9%	0.0%	0.5%	0.0%	0.0%	1.4%	0.0%	0.0%	3.0%	6.1%
Cod	3.1%	4.6%	0.7%	1.4%	1.3%	11.4%	5.5%	0.6%	0.0%	1.4%	4.5%	3.3%	3.0%	3.0%
Cod, smoked	1.9%	1.7%	3.6%	0.8%	1.9%	2.2%	1.0%	1.9%	1.2%	3.4%	1.5%	0.0%	3.0%	3.0%
Dhufish	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.9%	3.0%	0.0%	0.0%	0.0%
Dory	1.8%	1.9%	2.2%	2.4%	0.0%	1.6%	0.0%	0.6%	0.0%	2.9%	3.0%	0.0%	0.0%	9.1%
Flathead	6.1%	9.5%	14.0%	5.2%	5.7%	3.8%	1.5%	3.1%	1.2%	1.4%	1.5%	13.3%	6.1%	3.0%
Flounder	1.8%	1.0%	2.9%	2.0%	2.5%	0.5%	0.5%	2.5%	0.0%	1.4%	0.0%	6.7%	9.1%	6.1%
Garfish	1.9%	0.4%	0.0%	1.4%	0.0%	0.5%	0.0%	14.3%	12.9%	0.5%	0.0%	3.3%	0.0%	0.0%
Gemfish	1.2%	2.9%	1.8%	1.6%	0.6%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hake	1.2%	0.4%	2.2%	0.6%	1.3%	1.1%	1.0%	1.2%	2.4%	2.9%	3.0%	0.0%	0.0%	0.0%
Herring	1.0%	0.2%	0.4%	0.2%	0.0%	0.0%	0.0%	4.3%	3.5%	3.9%	4.5%	0.0%	0.0%	3.0%
Mackerel	2.3%	0.4%	4.3%	0.2%	0.0%	5.4%	11.9%	1.9%	2.4%	1.0%	1.5%	0.0%	0.0%	0.0%
Mullet	3.8%	3.3%	6.1%	0.4%	0.6%	6.5%	12.4%	5.6%	8.2%	1.4%	0.0%	0.0%	0.0%	0.0%
Orange roughy	6.1%	7.0%	5.4%	7.0%	8.2%	13.6%	0.5%	4.3%	4.7%	1.0%	0.0%	3.3%	15.2%	15.2%
Perch	4.0%	8.9%	5.0%	1.2%	0.0%	7.6%	5.0%	1.9%	3.5%	0.5%	0.0%	3.3%	3.0%	0.0%
Pilchard/sardine	0.2%	0.2%	0.0%	0.2%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	3.0%	0.0%	0.0%	0.0%
Salmon- Aust.	0.6%	0.0%	0.0%	0.4%	0.0%	0.0%	2.5%	1.2%	1.2%	1.9%	0.0%	0.0%	0.0%	0.0%
Salmon - Atlantic	0.2%	0.2%	0.0%	0.2%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	3.3%	3.0%	0.0%
Salmon - other	0.8%	1.5%	0.4%	0.2%	0.6%	1.1%	0.5%	1.2%	2.4%	0.0%	1.5%	0.0%	0.0%	0.0%
Shark	9.8%	1.9%	5.7%	23.4%	29.7%	3.3%	3.0%	1.2%	5.9%	5.3%	11.9%	6.7%	15.2%	18.2%
Snapper	7.1%	5.8%	4.3%	5.2%	1.9%	2.2%	0.0%	5.0%	15.3%	31.9%	19.4%	0.0%	0.0%	0.0%
Trevally	3.0%	1.5%	0.4%	8.8%	3.2%	0.5%	0.0%	0.6%	1.2%	1.0%	6.0%	3.3%	9.1%	6.1%
Trout	2.6%	1.5%	2.2%	4.8%	3.8%	1.6%	3.5%	1.2%	0.0%	0.0%	1.5%	10.0%	3.0%	12.1%
Whiting	10.5%	4.4%	6.5%	11.8%	13.3%	13.0%	10.4%	24.8%	20.0%	11.6%	11.9%	6.7%	3.0%	0.0%
Other fish	15.5%	21.9%	18.6%	11.4%	12.0%	13.6%	21.9%	2.5%	4.7%	15.5%	17.9%	16.7%	24.2%	15.2%
Total (%) ('000 meal-type-occasion)	100.0% 2456	100.0% 517	100.0% 279	100.0% 501	100.0% 158	100.0% 184	100.0% 201	100.0% 161	100.0% 85	100.0% 207	100.0% 67	100.0% 30	100.0% 33	100.0% 33

Note: on the basis of catch statistics it is suspected that most perch mentions are in fact orange roughy. Similarly it is suspected that most bream mentions are morwong.

Table 4.2.3.8: Species of Seafood Consumed In-Home in Each Region Proportion of Seafood Meal-Type-Occasions (Not Including Canned/Processed Seafood)

Seafood	Total	Syd	Reg NSW	Melb	Reg Vic	Bris	Reg QLD	Adel	Reg SA	Per	Reg WA	Canb	Hob	Reg TAS
Bugs	1.8%	1.5%	1.9%	0.0%	0.0%	0.0%	9.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Crabs	8.8%	5.4%	3.8%	12.7%	0.0%	11.1%	18.4%	6.7%	0.0%	15.7%	16.7%	16.7%	0.0%	0.0%
Crayfish/Lobster	3.8%	2.0%	2.8%	1.3%	9.5%	0.0%	0.0%	3.3%	57.1%	7.8%	11.1%	0.0%	14.3%	37.5%
Marinara	0.2%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Mussels	2.1%	2.0%	0.0%	2.5%	0.0%	0.0%	2.6%	0.0%	0.0%	7.8%	11.1%	0.0%	0.0%	0.0%
Octopus	1.8%	4.4%	0.0%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	3.9%	0.0%	0.0%	0.0%	0.0%
Oysters	4.0%	3.9%	8.5%	1.3%	0.0%	2.2%	6.6%	0.0%	0.0%	3.9%	0.0%	0.0%	0.0%	0.0%
Prawns (whole)	58.3%	67.5%	66.0%	39.2%	52.4%	75.6%	55.3%	60.0%	28.6%	47.1%	38.9%	66.7%	14.3%	25.0%
Prawns (other)	0.6%	1.0%	0.0%	2.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Scallops	5.5%	2.5%	2.8%	11.4%	19.0%	2.2%	3.9%	3.3%	14.3%	2.0%	5.6%	16.7%	57.1%	25.0%
Seafood extender	1.8%	2.5%	3.8%	0.0%	0.0%	2.2%	0.0%	3.3%	0.0%	2.0%	0.0%	0.0%	0.0%	0.0%
Squid/calamari	7.5%	4.9%	6.6%	20.3%	14.3%	6.7%	0.0%	13.3%	0.0%	9.8%	5.6%	0.0%	0.0%	0.0%
Other	3.8%	2.0%	3.8%	7.6%	4.8%	0.0%	3.9%	10.0%	0.0%	0.0%	11.1%	0.0%	14.3%	12.5%
Total (%) ('000 meal-type-occasion)	100.0% 657	100.0% 203	100.0% 106	100.0% 79	100.0% 21	100.0% 45	100.0% 76	100.0% 30	100.0% 7	100.0% 51	100.0% 18	100.0% 6	100.0% 7	100.0% 8

Table 4.2.3.9a: Most Popular Species of Fish Consumed In-Home By Meal-Type-Occasions (Not Including Canned/Processed Fish)

Rank	Total	Syd	Reg NSW	Melb	Reg Vic	Bris	Reg QLD	Adel	Reg SA	Per	Reg WA	Canb	Hob	Reg TAS
1	Whiting	Bream	Flathead	Shark	Shark	*O roughy and perch	Mullet	Whiting	Whiting	Snapper	Snapper	Bream	*O roughy and perch	Shark
2	Shark	*O roughy and perch	Bream	Whiting	Whiting	Whiting	Mackerel	Butterfish	Snapper	Whiting	Shark	Flathead	Shark	*O roughy and perch
3	Bream	Flathead	*O roughy and perch	Trevally	Blue grenadier	Cod	Barra-mundi	Garfish	Garfish	Shark	Whiting	Trout	Flounder	Trout

** on the basis of catch statistics it is suspected that most perch mentions were actually orange roughy. Hence the species have been combined for the sake of gauging their popularity .*

Table 4.2.3.9b: Most Popular Species of Seafood Consumed In-Home By Meal-Type-Occasions (Not Including Canned/Processed Seafood)

Rank	Total	Syd	Reg NSW	Mel	Reg Vic	Bris	Reg QLD	Adel	Reg SA	Per	Reg WA	Canb	Hob	Reg TAS
1	Prawns (whole)	Prawns (whole)	Prawns (whole)	Prawns (whole)	Prawns (whole)	Prawns (whole)	Prawns (whole)	Prawns (whole)	Crayfish/ lobster	Prawns (whole)	Prawns (whole)	Prawns (whole)	Scallops	Crayfish/ lobster
2	Crabs	Crabs	Oysters	Squid/ calamari	Scallops	Crabs	Crabs	Squid/ calamari	Prawns (whole)	Crabs	Crabs	Crabs	Crayfish/ lobster	Prawns (whole)
3	Squid/ calamari	Squid/ calamari	Squid/ calamari	Crabs	Squid/ calamari	Squid/ calamari	Bugs	Crabs	Scallops	Squid/ calamari	Crayfish/ lobster	Scallops	Prawns (whole)	Scallops

4.3 Purchase Behaviour

4.3.1 Where Each Form of Fish and Seafood is Purchased

Respondents that had eaten fish/seafood in-home within the seven days prior to interview were asked where they (or someone else in the household) had bought or obtained the fish/seafood.

Table 4.3.1.1 provides a summary of weighted responses to this question for fish meal-type-occasions. Table 4.3.1.2 shows the equivalent results for seafood. The percentages shown represent a proportion of the total in-home meal-type-occasions for the particular form of fish or seafood shown at the top of each column. The figures do not directly relate to purchasing since one purchase of fish or seafood could provide for several meals (meal-type-occasions). This should be kept in mind when interpreting results.

Table 4.3.1.1 shows that the sources of fresh fish are more diverse than for most other forms of fish. Specialist retail fish shops are the most popular single source of supply representing 34.7% of fresh fish meal-type-occasions, followed by fish or general markets at 18.1%. Gifted or own caught fresh fish represent a total of 18.4% of fresh fish meal-type-occasions. Only 11.3% of fresh fish meal-type-occasions are the result of purchases from supermarkets.

A far higher proportion of frozen fish is purchased at supermarkets/food stores (50.2% of frozen fish meal-type-occasions).

The processed products of “fish fingers”, other frozen packaged and “canned” fish are predominantly purchased from supermarkets/food stores.

A far lower proportion of frozen seafood (Table 4.3.1.2) was purchased at supermarkets/food stores than was the case for frozen fish. Retail fish shops, fish or general markets and wholesaler/co-operatives accounted for a total of 47.6% of frozen seafood meal-type-occasions.

The 320,000 meal-type-occasions per week of “other” forms of seafood are mostly cooked seafood or seafood purchased as an ingredient in take-away meals such as Chinese dishes. For example, Table 4.3.1.2 shows that 37.2% of “other” seafood meal-type-occasions were sourced from fish and chip shop/take-aways.

Tables 4.3.1.3 and 4.3.1.4 show the 1990/91 survey data manipulated to allow comparison with equivalent results from the 1977 study.

The figures in the “Total all forms” column of Tables 4.3.1.3 and 4.3.1.4 indicate a decline in the share of supermarket purchases with regard to in-home fish/seafood meal-type-occasions. However, this is a result of a relative decline in the consumption of processed and canned fish and seafood versus fresh and frozen forms, as already discussed in Section 4.2.1. In fact, the “share” of supermarket purchases in the in-home consumption of most forms of fish and seafood has increased since 1977. Supermarket purchases accounted for 16.7% of all fresh and frozen fish meal-type-occasions in 1990/91 compared to only 7.3% in 1977. Nonetheless, increased purchases of fresh and frozen fish and seafood from supermarkets have not made up for losses in supermarket “share” due to the decline in consumption of processed and canned products.

As already discussed, “other” forms of seafood were mostly cooked seafood and seafood used as an ingredient in take-away meals. As with fish, the 1977 study treated take-away seafood meals as a category on their own, without any consideration of whether they were eaten in or out-of-home. Hence, comparison between 1977 and 1990/91 “other” and “all forms” seafood categories is not strictly valid.

Table 4.3.1.1: Sources of Fish for In-Home Consumption: Proportion of Fish Meal-Type-Occasions (%)

	All forms	Fresh	Frozen	Fish Fingers	Other frozen packaged	Canned	Smoked	Cooked fillet	Other
Commercial fisherman	0.7%	1.7%	0.3%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
Other fisherman	0.2%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Wholesaler/co-op	2.6%	5.1%	4.7%	1.5%	0.5%	0.2%	7.6%	0.5%	0.0%
Fish or general market	7.9%	18.1%	6.2%	0.0%	1.0%	0.5%	2.5%	0.8%	5.2%
Retail fish shop(uncooked)	14.7%	34.7%	14.5%	0.0%	2.2%	0.2%	7.6%	0.8%	0.5%
Fish & chip shop/take-away	10.7%	7.3%	3.0%	0.0%	1.1%	0.4%	3.8%	90.9%	14.6%
Supermarket/food store	49.5%	11.3%	50.2%	94.7%	92.6%	94.7%	53.0%	1.6%	38.2%
Convenience store (late trading)	0.9%	0.2%	1.0%	2.3%	0.6%	1.9%	0.0%	0.3%	0.5%
Delicatessen	1.1%	0.7%	1.7%	0.8%	0.5%	0.8%	19.0%	0.0%	3.2%
Caught by household member	5.5%	10.3%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.8%
Gift by non-household member	4.2%	8.1%	8.6%	0.0%	0.5%	0.5%	3.8%	0.3%	5.8%
Other	1.6%	1.8%	2.7%	0.8%	1.0%	0.4%	2.5%	3.6%	4.6%
Don't know/can't say	0.2%	0.1%	0.0%	0.0%	0.0%	0.3%	0.0%	0.5%	1.0%
No answer	0.1%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.5%	0.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
000's meal-type-occasions	4809	1867	301	132	180	1692	79	364	194

Table 4.3.1.2: Sources of Seafood for In-Home Consumption : Proportion of Seafood Meal-Type-Occasions (%)

	All forms	Fresh	Frozen	Frozen packaged ready to cook	Canned	Other
Commercial fisherman	4.2%	4.6%	2.1%	5.1%	0.0%	4.7%
Other fisherman	0.9%	1.5%	2.1%	0.0%	0.0%	0.3%
Wholesaler/co-op	5.4%	8.0%	10.4%	8.0%	0.0%	2.2%
Fish or general market	16.2%	24.8%	11.3%	15.7%	0.0%	9.3%
Retail fish shop (uncooked)	17.5%	26.6%	25.9%	0.0%	0.0%	10.6%
Fish & chip shop/take-away	16.2%	4.0%	4.3%	5.1%	0.0%	37.1%
Supermarket/food store	16.3%	7.2%	18.7%	52.1%	94.7%	8.5%
Convenience store (late trading)	0.9%	0.8%	0.0%	2.6%	0.0%	1.2%
Delicatessen	2.2%	1.3%	6.3%	0.3%	0.0%	3.3%
Caught by household member	2.8%	4.4%	0.0%	0.0%	0.0%	2.2%
Gift by non-household member	6.5%	10.3%	10.6%	2.8%	1.7%	2.4%
Other	10.2%	6.1%	8.3%	8.3%	1.7%	17.2%
Don't know/can't say	0.7%	0.5%	0.0%	0.0%	1.8%	0.9%
No answer	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
'000s meal-type-occasions	855	390	48	39	58	320

Table 4.3.1.3: The Sources of Fish for In-Home Consumption 1977 Versus 1990/91: Proportion of Meal-Type-Occasions (%)

	Total all forms		Fresh and frozen		Fish fingers		Other frozen packaged		Canned		Smoked		Other	
	1977	90/91	1977	90/91	1977	90/91	1977	90/91	1977	90/91	1977	90/91	1977	90/91
Fish market	6.0%	8.5%	18.1%	16.5%	0.1%	0.0%	1.6%	1.0%	0.0%	0.5%	4.4%	2.5%	2.3%	5.2%
Retail fish shop	13.8%	15.9%	38.6%	31.9%	0.7%	0.0%	4.6%	2.2%	0.2%	0.2%	16.1%	7.6%	4.6%	0.5%
Supermarket	59.7%	53.4%	7.3%	16.7%	92.9%	94.7%	78.3%	92.6%	95.0%	94.7%	37.0%	53.0%	41.2%	38.2%
Delicatessen	4.3%	1.2%	1.7%	0.8%	1.0%	0.8%	2.2%	0.5%	1.2%	0.8%	19.6%	19.0%	29.8%	3.2%
Caught/gift	8.2%	10.4%	27.1%	18.0%	0.1%	0.0%	2.6%	0.5%	0.2%	0.5%	1.4%	3.8%	1.5%	31.6%
Other	8.0%	10.6%	7.1%	16.1%	5.2%	4.5%	10.7%	3.1%	3.2%	3.4%	21.6%	14.0%	20.0%	21.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
000's occasions	3040	4445	942	2168	406	132	113	180	1440	1692	104	79	35	194

*Note: 1) fish purchased in "cooked fillet" form has been excluded from the 1990/91 data above since the 1977 report treated this form separately
2) the 1977 study covered the 7 capital cities (excluding Darwin) whereas the 1990/91 study covered the same cities and regional areas in the same states*

Table 4.3.1.4: The Sources of Seafood for In-Home Consumption 1977 Versus 1990/91: Proportion of Meal-Type-Occasions (%)

	Total all forms		Fresh and frozen		Frozen packaged		Canned		Other	
	1977	90/91	1977	90/91	1977	90/91	1977	90/91	1977	90/91*
Fish market	12.8%	16.2%	23.2%	23.3%	2.5%	15.7%	0.3%	0.0%	3.3%	9.3%
Retail fish shop	25.8%	17.5%	45.6%	26.5%	8.3%	0.0%	0.3%	0.0%	17.1%	10.6%
Supermarket	40.0%	16.3%	3.7%	8.5%	70.1%	52.1%	91.5%	94.7%	7.2%	8.5%
Delicatessen	3.1%	2.2%	2.1%	1.8%	4.6%	0.3%	3.2%	0.0%	13.3%	3.3%
Caught/Gift	9.2%	9.3%	15.6%	14.3%	2.8%	2.8%	0.7%	1.7%	16.8%	4.6%
Others	9.1%	38.6%	9.8%	25.6%	11.7%	29.1%	4.1%	3.6%	42.3%	63.7%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
000's occasions	445	855	255	438	35	39	136	58	19	320

Note: 1) the 1977 seafood data was from the June Quarter 1976 survey whereas the 1990/91 data is the average of all four quarters of the survey

2) the 1977 study covered the 7 capital cities (excluding Darwin) whereas the 1990/91 study covered the same cities and regional areas in the same states

** includes seafood purchased at take-aways/fish and chip shops that is not included in 1977 data.*

4.4 Product Preparation for In-Home Consumption

4.4.1 Proportion of In-Home Fish/Seafood Meals which are Cooked in the Home Versus Bought Precooked

Respondents were asked whether the fish/seafood type(s) they had eaten in-home in the last seven days was purchased pre-cooked or whether it had been cooked in-home.

Table 4.4.1.1 shows survey results by meal-occasions, dinner, lunch and breakfast. As might be expected, more dinner meal types are cooked in the home than lunch or breakfast fish/seafood meal types.

Table 4.4.1.1: Proportion of In-Home Fish/Seafood Type Meal-Occasions Which are Cooked in the Home Versus Bought (Pre) Cooked to Eat in the Home

	All meals	Dinner	Lunch	Break-fast	Other person	Other self
Cooked and served % (meal-type-occasions '000)	68% 3849	72% 2722	59% 878	66% 101	54% 48	59% 100
Bought cooked to eat % (meal-type-occasions '000)	30% 1683	26% 960	38% 570	31% 47	43% 38	39% 67
No answer % (meal-type-occasions '000)	2% 127	2% 75	3% 41	3% 5	3% 3	2% 3
Total% (meal-type-occasions '000)	100% 5658	100% 3757	100% 1489	100% 154	100% 89	100% 170

Almost half of all “bought cooked” meal-type-occasions were cooked fillets purchased from fish and chip shops/take-away outlets. Most of the lunchtime “bought cooked” occasions consisted of canned fish. Cooked prawns accounted for 10% of “bought cooked” fish/seafood meal-type-occasions.

A diverse range of processed fish and seafood accounted for the remainder of the “bought cooked” meal-type-occasions. This included such fish/seafood types as fish paste, crumbed fish fillets, seafood pizza and fish cakes.

4.4.2 How Different Forms of Fish and Seafood are Cooked/Prepared/Served In-Home

The method by which fish and seafood is cooked/prepared/served in-home is highly dependent upon the form of purchase, as common sense and the survey results suggest.

This is most obvious in the case of serving fish straight where canned, smoked and “other” were the only forms served straight (Table 4.4.2.1).

Preferred methods of preparation for fresh and frozen forms of fish were similar - namely pan fried, grilling, deep frying (at home) and baking (oven). However, a significantly higher proportion of fresh fish was grilled while a higher proportion of frozen fish was baked.

Over half of “other frozen packaged (ready to cook)” fish meal-type-occasions were baked in an oven and 11.3% were microwaved.

The preparation of seafood was also dependent upon the form of purchase, as shown by Table 4.4.2.2. As with canned fish, almost two thirds of canned seafood was served straight from the can.

Popular methods of cooking/preparing/serving fresh seafood were straight (19.2% of meal-type-occasions), pan fried (12.5%), boil/boil in bag (11.8%) and used as an ingredient either in mornay stir fry, casserole or other dishes (21.1% in total).

The most popular methods of preparing “other” forms of seafood were in keeping with the ‘take-away’ source of much of this form (see Section 4.3.1). For example, 16.4% of “other” seafood meal-type-occasions were deep fried bought out-of-home, 13.4% were served straight, 10.3% as a pizza topping and 8.4% as an ingredient-stir fry.

Tables 4.4.2.3 and 4.4.2.4 allow an examination of trends in the preparation of fish and seafood in-home since 1977. Since the 1977 figures shown do not include fish and seafood purchased as a take-away meal, the 1990/91 data has been manipulated to exclude this fish and seafood where possible. Nonetheless, the “all forms” and “other” 1977 versus 1990/91 results in Tables 4.4.2.3 and 4.4.2.4 are not directly comparable.

Table 4.4.2.3 shows that fresh and frozen fish was more often grilled in 1990/91 than in 1977. “Other” methods of cooking/preparing/serving fresh and frozen fish have increased from 7.0% to 14.7% of meal-type-occasions. Referring back to Table 4.4.2.1, the 14.7% figure mainly consists of meal-type-occasions that were cooked/prepared/served, microwaved, barbecued, poached, ingredient-stir fry, ingredient-casserole and ingredient-other.

Fish fingers were far more often served grilled in 1990/91 than was the case in 1977. Other frozen packaged fish was predominantly baked in 1990/91 versus fried in 1977.

The popularity of serving canned fish straight has waned in 1990/91 versus 1977. “Other” methods of cooking/preparing/serving canned fish are now used for 25.8% of canned fish meal-type-occasions. Most of these “other” methods were canned fish served as an ingredient-casserole, or ingredient-other (see Table 4.4.2.1). This indicates broader usage of canned fish than was the case in 1977.

Referring to Table 4.4.2.4 and back to Table 4.4.2.2, the preferred methods of preparing fresh and frozen seafood have changed significantly since 1977. The 50% of fresh and frozen seafood meal-type-occasions cooked by “other” methods of preparation include seafood used as an ingredient in mornay, stir fry, casserole and other dishes. Grilling, steaming, barbecuing and serving raw seafood are also significant.

The preferred methods of preparing frozen packaged and canned seafoods have also shifted away from straight to various alternate methods in much the same way as explained above for fresh and frozen seafood.

Table 4.4.2.1: How Different Forms of Fish are Cooked/Prepared/Served In-Home: Proportion of Fish Meal-Type-Occasions (%)

	All forms	Fresh	Frozen	Fish fingers	Other frozen packaged	Canned	Smoked	Cooked fillet	Other
Boil/boiled in the bag	1.7%	2.1%	4.6%	0.0%	5.4%	0.3%	13.1%	0.0%	1.6%
Baked/oven	7.6%	8.1%	22.8%	6.7%	51.3%	1.4%	3.9%	0.3%	8.3%
Grilled	12.8%	23.3%	14.6%	31.9%	11.0%	0.4%	1.3%	11.6%	11.4%
Deep fried at home	5.0%	9.3%	10.2%	11.9%	1.1%	0.2%	0.0%	1.4%	5.5%
Deep fried - bought out of home	8.4%	4.0%	3.0%	1.5%	2.1%	0.0%	0.0%	81.8%	8.0%
Steamed	2.6%	5.3%	3.3%	0.0%	0.0%	0.1%	14.5%	0.6%	1.0%
Microwaved	3.6%	5.5%	7.9%	5.9%	11.3%	0.6%	2.6%	0.3%	3.4%
Raw	1.1%	0.9%	0.0%	1.5%	0.6%	1.7%	5.3%	0.0%	0.5%
Straight	23.6%	0.2%	0.0%	0.0%	0.6%	62.4%	21.1%	0.6%	30.6%
Barbecued	1.4%	3.3%	0.3%	0.7%	0.5%	0.1%	0.0%	0.3%	1.0%
Pan fried	17.5%	32.4%	30.6%	38.5%	13.4%	2.4%	2.6%	2.5%	9.3%
Poached (water in pan)	0.9%	1.5%	1.0%	0.0%	0.0%	0.1%	14.5%	0.0%	1.0%
Pizza topping	0.6%	0.0%	0.0%	0.0%	1.1%	0.8%	0.0%	0.0%	6.3%
Ingredient - mornay	2.7%	0.4%	0.0%	0.0%	0.0%	7.0%	6.6%	0.0%	0.1%
Ingredient - stir fry	0.4%	0.6%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.5%
Ingredient - casserole	3.1%	0.7%	0.0%	0.0%	0.6%	7.6%	4.0%	0.0%	1.0%
Ingredient - other	3.3%	0.6%	0.3%	0.7%	0.0%	8.2%	1.3%	0.0%	2.6%
Other	3.3%	1.6%	1.0%	0.7%	1.1%	6.3%	7.9%	0.3%	5.6%
Don't know	0.2%	0.2%	0.0%	0.0%	0.0%	0.1%	1.3%	0.6%	2.1%
No answer	0.0%	0.1%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
'000s meal-type-occasions	4800	1866	300	135	178	1690	76	363	193

Table 4.4.2.2: How Different Forms of Seafood are Cooked/Prepared/Served In-Home: Proportion of Seafood Meal-Type-Occasions (%)

	All forms	Fresh	Frozen	Frozen packaged ready to cook	Canned	Other
Boil/boiled in the bag	10.3%	11.8%	8.7%	6.2%	0.0%	10.9%
Baked/oven	1.8%	0.9%	1.1%	20.1%	0.0%	1.3%
Grilled	1.6%	2.2%	2.4%	9.1%	0.0%	0.3%
Deep fried at home	5.3%	4.8%	15.3%	18.6%	0.0%	3.9%
Deep fried - bought out of home	7.0%	1.3%	4.2%	0.6%	0.0%	16.4%
Steamed	3.1%	3.6%	4.1%	0.0%	0.0%	3.4%
Microwaved	1.9%	2.5%	4.7%	7.6%	0.0%	0.5%
Raw	3.7%	5.3%	6.1%	5.3%	1.7%	1.6%
Straight	18.9%	19.2%	10.2%	10.6%	59.8%	13.4%
Barbecued	1.5%	2.9%	0.0%	2.9%	0.0%	0.3%
Pan fried	8.3%	12.5%	12.7%	8.4%	0.0%	4.1%
Poached (water in pan)	0.8%	1.0%	0.0%	0.0%	0.0%	0.9%
Pizza topping	5.0%	0.8%	6.1%	0.0%	7.0%	10.3%
Ingredient - mornay	2.2%	4.5%	0.0%	0.0%	0.1%	0.5%
Ingredient - stir fry	7.1%	7.3%	8.1%	2.7%	1.7%	8.1%
Ingredient - casserole	3.1%	5.4%	4.1%	0.0%	0.1%	0.9%
Ingredient - other	7.4%	3.9%	10.2%	5.3%	12.2%	10.6%
Other	9.3%	9.1%	2.1%	2.7%	12.2%	11.0%
Don't know	1.1%	0.5%	0.0%	0.0%	3.5%	1.6%
No answer	0.5%	0.8%	0.0%	0.0%	1.7%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
'000s meal-type--occasions	851	386	49	38	57	320

Table 4.4.2.3: How Fish is Cooked/Prepared/Served In-Home: 1977 Versus 1990/91: Proportion of Meal-Type-Occasions

	All forms*		Fresh & frozen		Fish fingers		Other frozen packaged		Canned		Smoked		Other*	
	1977	'90/91	1977	'90/91	1977	'90/91	1977	'90/91	1977	'90/91	1977	'90/91	1977	'90/91
Boil/boiled in bag	3.2%	1.9%	3.3%	2.6%	0.7%	0.0%	2.7%	5.5%	0.4%	0.3%	52.4%	13.1%	0.0%	1.7%
Baked/oven	3.5%	8.4%	8.4%	10.6%	3.0%	6.8%	4.4%	52.4%	0.5%	1.4%	1.9%	3.9%	0.0%	9.0%
Grilled	6.5%	13.2%	13.2%	23.0%	13.8%	32.3%	11.5%	11.2%	0.1%	0.4%	2.9%	1.3%	2.8%	12.4%
Fried†	32.8%	24.7%	59.8%	43.2%	76.0%	51.1%	58.4%	14.8%	3.1%	2.6%	5.7%	2.6%	27.8%	16.1%
Steamed	3.2%	2.9%	6.6%	5.2%	0.0%	0.0%	12.4%	0.0%	0.6%	0.1%	9.5%	14.5%	5.6%	1.1%
Straight	39.1%	26.1%	0.3%	0.1%	0.5%	0.0%	2.7%	0.6%	79.6%	62.4%	16.2%	21.1%	50.0%	33.3%
Ingredient-mornay	4.5%	3.0%	0.8%	0.4%	0.0%	0.0%	0.9%	0.0%	8.7%	7.0%	3.8%	6.6%	2.8%	0.2%
Other	6.8%	19.6%	7.0%	14.7%	5.4%	9.8%	6.2%	15.5%	6.9%	25.8%	7.6%	35.6%	11.1%	24.0%
Don't know/ no answer	0.3%	0.3%	0.6%	0.2%	0.5%	0.0%	0.9%	0.0%	0.1%	0.1%	0.0%	1.3%	0.0%	2.3%
Total '000s meal-type-occasion	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	3039	4333	942	2083	405	133	113	175	1439	1690	105	76	36	177

Note: the 1990/91 figures are shown excluding fish purchased in "cooked fillet" form or served as "deep fried bought at home" since take-away fish purchased from chip shops and take-aways is not included in 1977 data shown

** 1990/91 and 1977 figures for "other" forms of fish and seafood are not strictly comparable since 1990/91 figures still include some fish and seafood types not included in 1977 figures*

† includes pan fried and deep fried at home in 1990/91.

Table 4.4.2.4: How Seafood is Cooked/Prepared/Served In-Home: 1977 Versus 1990/91: Proportion of Meal-Type-Occasions (%)

	All forms*		Fresh & frozen		Frozen packaged		Canned		Other*	
	1977	'90/91	1977	'90/91	1977	'90/91	1977	'90/91	1977	'90/91
Boil/boiled in bag	10.3%	11.0%	16.0%	11.6%	2.9%	6.2%	2.9%	0.0%	0.0%	13.1%
Fried†	15.1%	14.7%	15.6%	18.8%	47.1%	27.2%	7.4%	0.0%	5.0%	9.5%
Straight	56.0%	20.3%	45.3%	18.5%	29.4%	10.7%	77.9%	59.8%	90.0%	16.1%
Other	18.2%	52.4%	22.7%	50.0%	20.6%	56.0%	11.0%	35.0%	5.0%	59.5%
Don't know	0.4%	1.6%	0.4%	1.2%	0.0%	0.0%	0.7%	5.2%	0.0%	1.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
'000s meal-type-occasion	445	791	256	428	34	37	136	57	20	268

Note: the 1990/91 figures are shown excluding seafood served as "deep fried bought out-of-home"

** 1990/91 and 1977 figures for "other" forms of fish and seafood are not strictly comparable since 1990/91 figures still include some fish and seafood types not included in 1977 figures*

† includes pan fried and deep fried at home in 1990/91.

4.4.3 The Use of Recipes in the Preparation of In-Home Fish and Seafood Meals

Respondents were asked for each in-home fish/seafood meal-type-occasion in the last seven days whether a recipe had been used in meal preparation. As Table 4.4.3.1 shows, almost 9 in 10 meal-type-occasions are not cooked/prepared using a recipe though a slightly higher proportion of dinners are prepared using recipes than lunches and breakfasts.

Table 4.4.3.1: Proportion of In-Home Fish/Seafood Meal-Type-Occasions Cooked/Prepared Using a Recipe: Respondent Meals

	Total	Dinner	Lunch	Break-fast	Other meal consumed by self	Other meal consumed by other person
Yes	8.7%	10.5%	5.1%	2.5%	4.8%	7.3%
No	88.6%	86.7%	92.0%	96.2%	92.6%	90.7%
No Answer	2.7%	2.8%	2.9%	1.3%	2.6%	2.0%
Total	100%	100%	100%	100%	100%	100%

Table 4.4.3.2 shows approximately 1 in 10 fresh fish meal-type-occasions were cooked with the aid of a recipe. Testimony to the increased usage of canned fish as an ingredient in mornays, casseroles and the like, 11.8% of canned fish meal-type-occasions were cooked/prepared with a recipe.

Similarly, 14.3% of canned seafood meal-type-occasions were cooked/prepared with a recipe (Table 4.4.3.3).

Table 4.4.3.2: Recipe Use According to the Form of Fish Purchased: Proportion of Fish Meal-Type-Occasions (%)

	Total	Fresh	Frozen	Fish fingers	Other frozen packaged	Canned	Smoked	Cooked fillet	Other
Yes	8.7%	9.5%	6.0%	0.8%	1.6%	11.8%	11.6%	1.1%	3.5%
No	89.1%	88.7%	93.7%	95.4%	95.7%	85.9%	85.9%	95.6%	92.2%
No answer	2.2%	1.9%	0.3%	3.8%	2.7%	2.3%	2.6%	3.3%	4.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
'000s meal-type-occasions	4805	1868	301	131	179	1692	78	363	192

Table 4.4.3.3: Recipe Use According to the Form of Seafood Purchased: Proportion of Seafood Meal-Type-Occasions (%)

	Total	Fresh	Frozen	Frozen packaged ready to cook	Canned	Other
Yes	8.5%	11.7%	19.0%	0.6%	14.3%	2.9%
No	86.0%	81.0%	81.0%	99.1%	76.9%	92.8%
No answer	5.6%	7.3%	0.0%	0.3%	8.8%	4.3%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
'000s meal-type-occasions	850	388	48	38	57	320

4.5 Purchaser Attitudes - In-Home Consumption

4.5.1 Attitudes to Retail Outlets

Efforts to increase the consumption of fresh and frozen fish and seafood are likely to achieve greater success with a good understanding of important factors considered by the public when making a purchase.

A series of statements was read to respondents to the current survey who had consumed fish/seafood in-home in the last seven days purchased in fresh or frozen form from either a:

- fish or general market
- retail fish shop
- fish and chip shop/take-away
- supermarket/food store.

These respondents accounted for 80% of all respondent in-home meal-type-occasions.

Statements read to respondents concerned characteristics of the retail outlet that were expected to be of some importance to consumers when they chose a fish/seafood retail outlet. This range of characteristics were developed from an analysis of consumer focus group responses, the literature review and industry leader interviews.

Figures 4.5.1.1, 4.5.1.2, 4.5.1.3 and 4.5.1.4 detail the relative importance of these outlet characteristics to respondents.

For all four outlets, the factor “clean outlet/store” was ranked the most important. Another factor ranked consistently high in importance was the outlet “has a good reputation for quality fish/seafood”.

The ranking of other factors then depends upon whether the outlet is a supermarket/food store or whether it is one of the other three outlet types. This split is consistent with the recognition that supermarkets retail a wide range of products other than fish and seafood while the other three outlet types specialise in the sale of fresh and, to a lesser extent, frozen fish/seafood (see Section 4.3.1).

Hence, the factors that are ranked of next importance for retail fish shops (uncooked), fish and chip shop/take-away and fish or general market are:

- it sells fresh, rather than frozen fish/seafood
- confident that fresh fish/seafood hasn't been frozen.

In contrast, in the case of supermarkets/food stores the equivalent factors are:

- is easily accessible to me
- has friendly staff working there
- you can buy many different types of food there.

Two of the four most important ranked factors relating to the three outlet types other than supermarkets/food stores relate to retailer reputation and consumer confidence that fish/seafood sold as fresh is, in fact, fresh. It seems that consumers still have concerns over the quality of fish/seafood they buy and the integrity of fresh fish/seafood retailers in particular.

Other factors of importance for all outlet types are friendly staff and accessibility of the outlet.

Turning to lowly ranked factors:

- has consistently low prices for fish/seafood

- offers fish/seafood specials
- it offers advertised specials regularly,

were consistently ranked low in terms of their relative importance vis-à-vis other factors.

Figure 4.5.1.1: Importance of Factors - Supermarket/Food Store

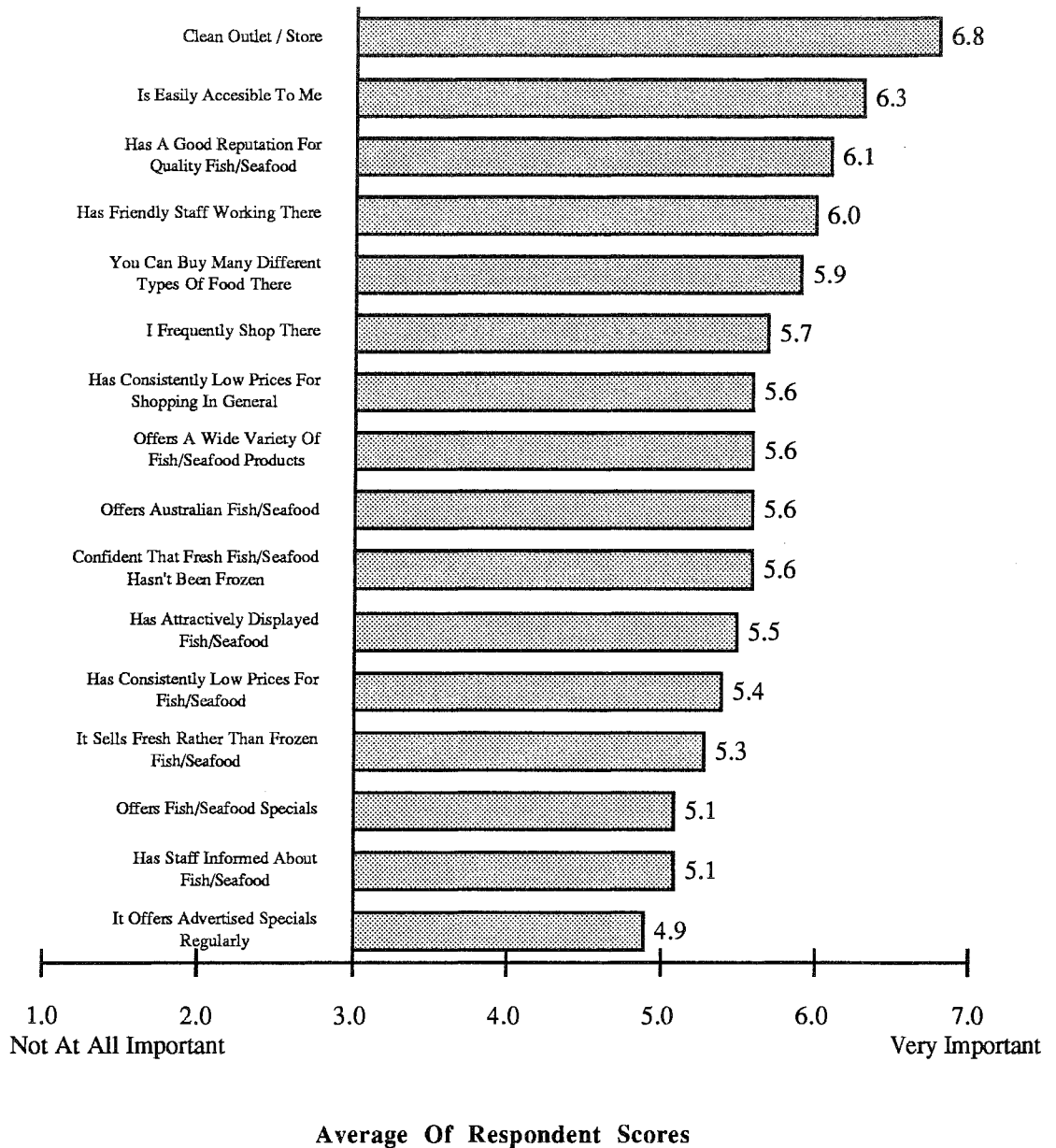


Figure 4.5.1.2: Importance of Factors - Retail Fish Shop (Uncooked)

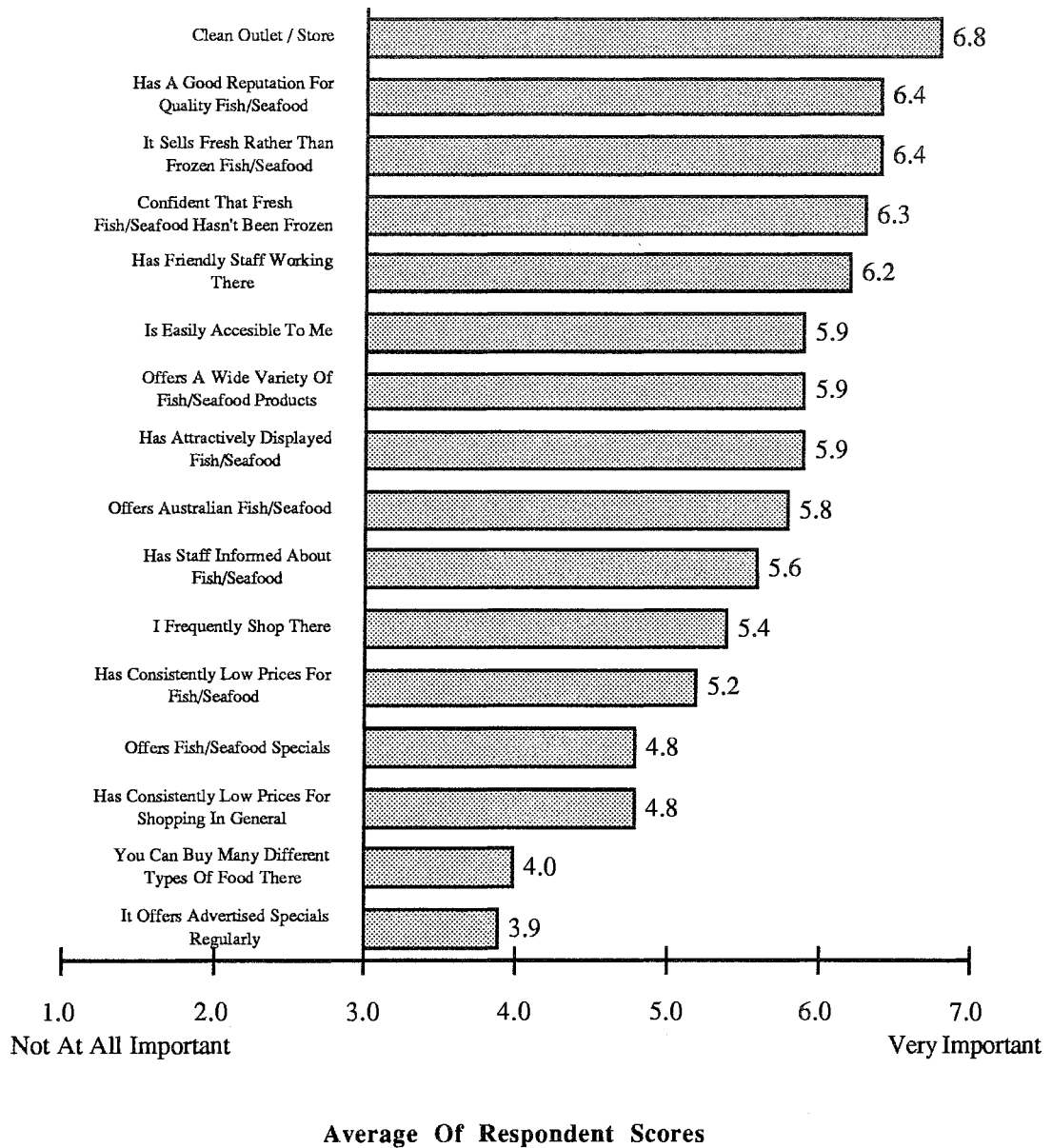


Figure 4.5.1.3: Importance of Factors - Fish & Chip Shop/Take-away

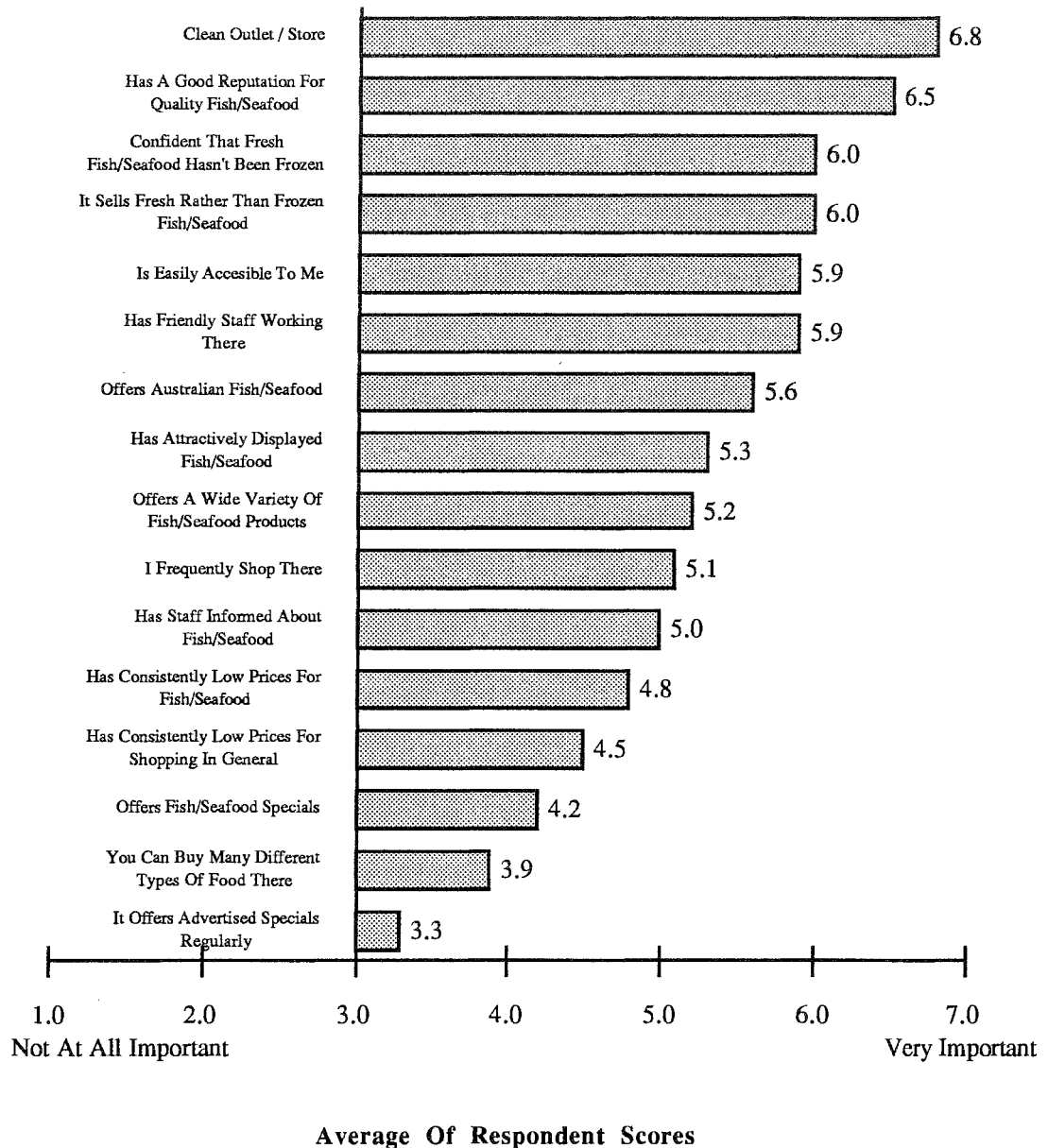
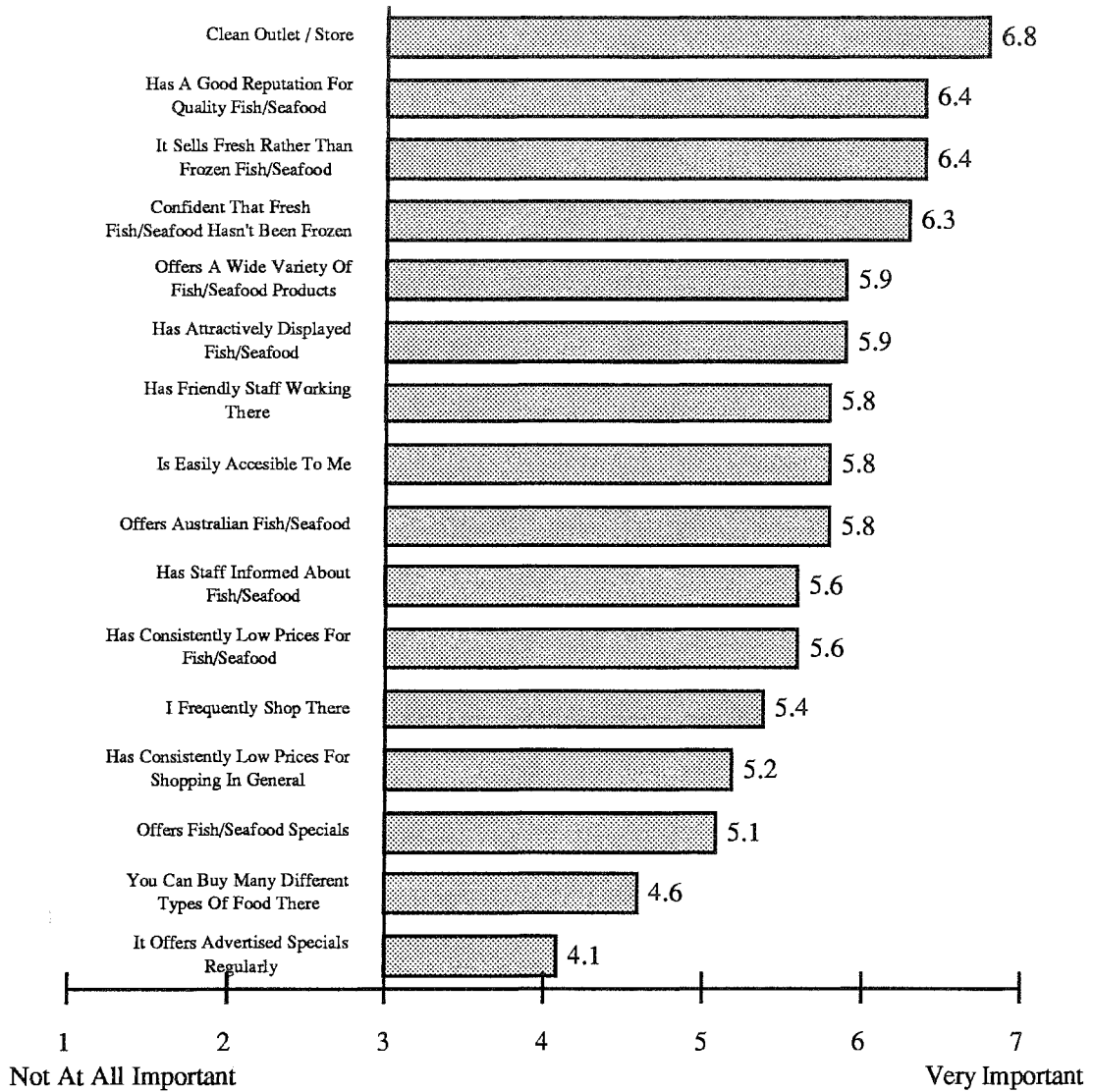


Figure 4.5.1.4: Importance of Factors - Fish or General Market



Average Of Respondent Scores

4.5.2 Attitudes to Fresh and Frozen Fish when Purchasing

The same subset of respondents polled for their attitudes to retail outlets (Section 4.5.1), were also asked for their attitudes to fresh or frozen **fish** when they actually select **fish** for an in-home meal. A series of statements of fish characteristics were read to each respondent and the respondent was asked to select how important the characteristic is to them.

Figure 4.5.2.1 ranks the average response for each of these statements. Results show a strong preference for fresh over frozen when purchasing fish. Consumers' concerns over the integrity of their fish retailers also surface in the equal top ranked characteristic, "I can be sure that the fish is labelled correctly". Concerns over species substitution and fish being sold as fresh when it has previously been frozen, that were discussed in Section 4.5.1, are likely to be at the heart of this consumer attitude.

The characteristic "the fish species I want" has been ranked highly. The closely related characteristic "it is a familiar type of fish" is also ranked moderately high in relative importance. These attitudes may hinder efforts to increase consumption of under-utilised species.

Confirming many comments from industry leaders, respondents favoured fish that has white or light coloured flesh and had been cut and filleted.

The relatively low ranking of "it is a relatively low price" is not due to most respondents giving it this ranking. Rather it is due to a diversity of respondent opinion that Table 4.5.2.1 shows to be related, at least in part, to household gross income.

Table 4.5.2.1 shows the proportion of respondents in a particular demographic grouping who gave the “very important” response to the statements as listed. For example, of the group of respondents whose household gross income was over \$60,000 pa, only 16% said that “it has a relatively low price”, was “very important” when they select fresh or frozen fish. On the other hand, 40% of respondents from the group whose household gross income was less than \$15,000 said it was “very important”. This divergence of opinion is the reason why, on average, the statement “it has a relatively low price”, was ranked quite low in importance. In contrast, the highly ranked “it is fresh rather than frozen” has been ranked “very important” by similar proportions of respondents from each demographic group (see Table 4.5.2.1).

Referring to Table 4.5.2.1, respondents in the older age groups have more rigid and stronger views than those in the younger age groups. For example, 57% of respondents in the age group over 60 years thought it very important that they buy “a familiar type of fish”. In contrast, only 36% of respondents from the under 40 years age group felt as strongly.

Those with lower household incomes also had stronger views and hence a less flexible approach to the purchase of fish. 49% of respondents in the under \$15,000 income group thought it very important that fish have “a light flavour” whereas only 24% of respondents from the over \$60,000 income group felt the same way.

This may explain the tendency of respondents living in Canberra to hold the least strong views for 7 out of the 13 statements. The sample characteristics discussed in Section 2.2.3 indicate average Canberra households’ gross income to be the highest of all cities/regions surveyed.

Table 4.5.2.1 also shows that migrants from non-English speaking countries have different attitudes to those of Australians and migrants from English speaking countries. Migrants from non-English speaking countries were less inclined to rank “I can be sure that the fish is correctly labelled” as very important. This is consistent with industry leaders’ views that people from Asian and non-English backgrounds were more familiar with the different fish species and more confident in their ability to judge fresh fish/seafood quality.

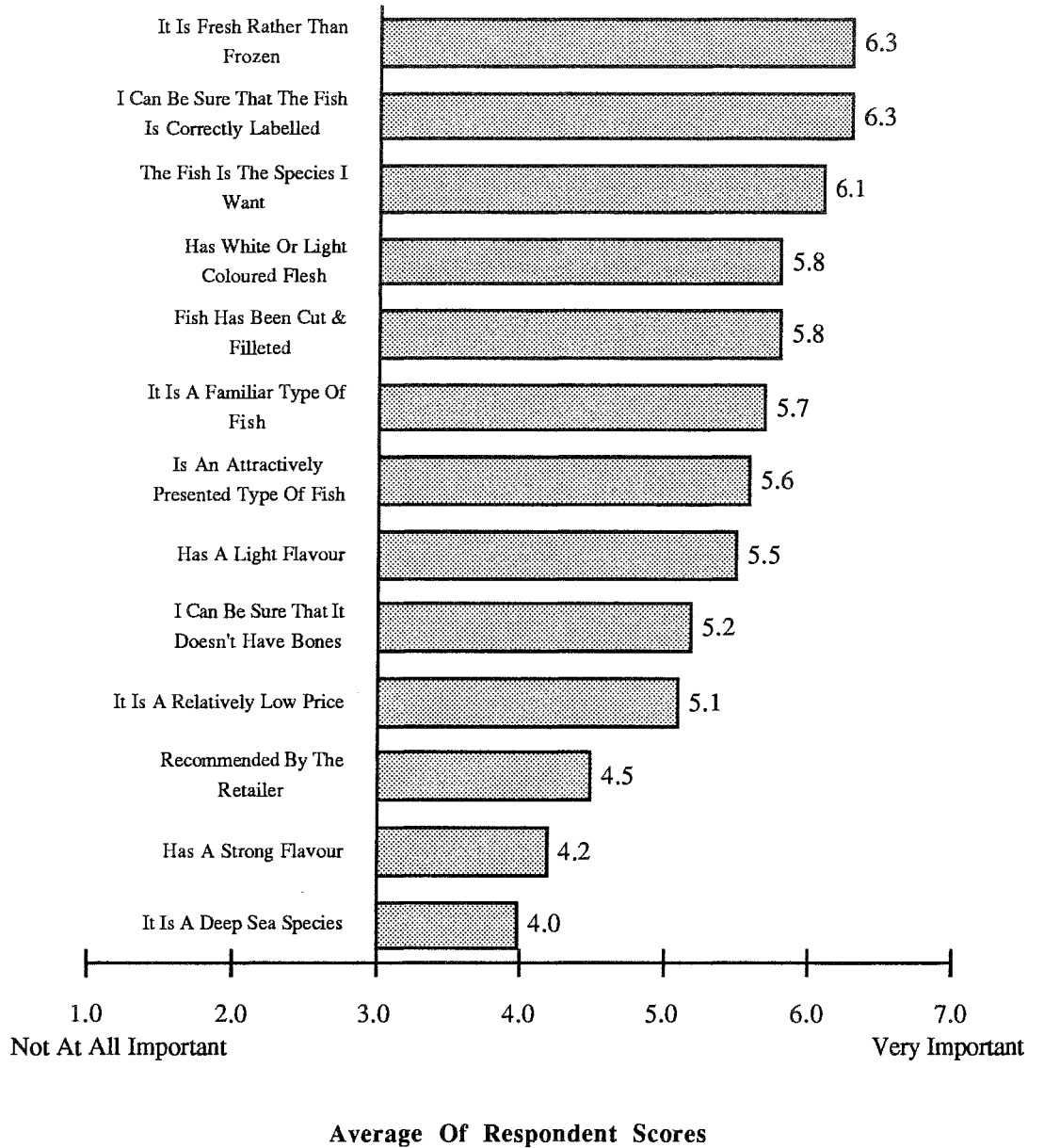
Table 4.5.2.1 Proportion of Main Meal Preparers Giving “Very Important” Response to Statements (%)

Statements (ranked as per Table 4.5.2.1)	Average Proportion giving “very important” responses	Regions of widest deviation from the average	Respondent Age Group			Household Income					Country of Origin**	
			Under 40 years	40-59 years	60+ years	Less than \$15,000	\$15,001- \$25,000	\$25,001 - \$40,000	\$40,001 - \$60,000	More than \$60,000	Aust/ English speaking country	Non- English speaking country
“It is fresh rather than frozen”	69	Regional Vic 80 Regional WA 44	64	74	69	67	68	69	76	67	68	77
“I can be sure that the fish is correctly labelled”	69	Regional Vic 91 Regional WA 55	65	70	72	72	72	68	70	63	71	58
“The fish species I want”	61	Hobart 66 Canberra 35	56	62	66	68	55	62	59	50	60	66
“Has a white or light coloured flesh”	53	Regional Tas 66 Canberra 38	43	55	63	60	56	51	48	42	55	44
“Fish has been cut and filleted”	56	Perth 66 Canberra 40	47	55	68	62	54	51	58	50	59	40
“It is a familiar type of fish”	46	Hobart 61 Canberra 26	36	47	57	57	49	47	37	30	47	43
“Is an attractively presented type of fish”	40	Hobart 60 Canberra 24	26	42	53	50	43	38	29	25	41	36
“Has a light flavour”	39	Regional Vic 58 Canberra 26	23	41	53	49	44	35	28	24	40	33
“I can be sure that it doesn’t have bones”	41	Regional Vic 58 Canberra 20	34	41	48	54	45	38	32	30	42	33
“It is a relatively low price”	31	*	29	30	35	40	38	34	18	16	31	32
“Recommended by the retailer”	24	*	17	26	28	28	30	20	18	18	24	20
“Has a strong flavour”	18	*	19	16	17	23	19	19	10	19	16	23
“It is a deep sea species”	17	*	9	20	23	26	22	12	10	14	17	20

* insufficient responses in these categories for reliable interpretation

** all those who emigrated to Australia before their fifth birthday were classed as originating from Australian/English speaking country for the purposes of the study.

Figure 4.5.2.1: Importance of Factors when Buying Fish



4.5.3 Alternatives for Preferred Species

All respondents who had consumed fish or seafood in-home in the last seven days were asked what they would have eaten instead if the fish/seafood they ate in-home on the last fish/seafood meal-occasion had not been available. As Table 4.5.3.1 shows, 48% of respondents opted for another type of food altogether rather than another type of fish or seafood. This indicates a strong consumer preference for a particular type/species of fish/seafood, consistent with attitudes discussed in Section 4.5.2.

Respondents from younger age groups were more willing to try another type of fish/seafood, similar to characteristics discovered in Section 4.5.2.

Migrants from non-English speaking countries also showed greater willingness to try another type of fish/seafood versus Australians or migrants from English speaking countries.

Table 4.5.3.1: Respondents' Meal Preference if the Fish/Seafood Type They had Consumed in the Last Seven Days had not been Available

	*Total	Age Group			Area		Country of Origin**	
		Under 40 Yrs	40 - 59 Yrs	60+ Yrs	Coastal	Inland	Aust or English Speaking Country	Non-English Speaking Country
Another type of fish/seafood (%)	45	38	50	48	46	40	44	54
Another type of food (%)	48	56	44	45	48	55	50	40
Don't know (%)	3	3	3	4	3	2	3	4
No answer (%)	3	3	2	3	3	3	3	2
Totals (%) and number of respondents ('000)	100% 3017	100% 1089	100% 1101	100% 828	100% 2582	100% 436	100% 2644	100% 282

* percentages do not add to 100% due to rounding

** all those who emigrated to Australia before their fifth birthday were classed as originating from Australian/English speaking country for the purposes of the study.

4.5.4 Common Perceptions of Fish and Seafood

The 1977 PA study and initial phases of the 1990/91 study (industry leader interviews, literature review and consumer focus groups) outlined major industry and consumer issues. These were:

- the availability of fish and seafood to the consumer
- consumer preferences for fresh versus frozen fish/seafood
- a lack of knowledge amongst some consumers with regard to the preparation of fish and seafood
- consumer perceptions of fish/seafood as a lighter meal and less filling than alternate sources of protein

- widespread consumer dislike for fish with bones
- consumer awareness of the health benefits of fish/seafood consumption
- deep consumer concern over the effect of pollution on fish and seafood safety.

Hence, the 1990/91 in-home questionnaire explored consumer attitudes to these issues by gauging the degree of consumer agreement or disagreement to 20 set statements read out. Responses to these 20 statements are discussed in this Section. Responses were also used to group respondents of similar attitudes using a technique termed “cluster analysis”. Cluster analysis is discussed in detail in Section 4.7.

Figures 4.5.4.1, 4.5.4.2, 4.5.4.3 and 4.5.4.4 provide the average response to each of these 20 statements. Within these averages there are groups of consumers that can be separated along demographic lines that have slightly different attitudes to other groups. For example Table 4.5.4.1 shows younger respondents to be less in agreement with the statement “quality fish/seafood can only be bought from a specialised fish outlet”.

**Table 4.5.4.1: Respondent Attitudes by Age Group:
Proportion of Respondents in Age Group**

Statement	Response	Respondent Age Group		
		Under 40 Yrs	40 - 59 Yrs	60+ Yrs
“Quality fish/seafood can only be bought from a specialised fish outlet”	Agree Strongly	24%	36%	36%
“I avoid freezing fish if I can”	Agree Strongly	36%	43%	42%
“The taste of frozen fish is as good as fresh fish”	Disagree Strongly	34%	40%	39%

Figure 4.5.4.1 shows that most respondents still prefer fresh fish over frozen fish since they cannot be sure of frozen fish quality and don't like the taste of frozen fish. However, Table 4.5.4.1 shows younger respondents were not as averse to freezing fish or the taste of fish that had been frozen.

Many industry leaders suggested a need to provide recipes and cooking demonstrations to encourage greater consumption of fish/seafood. The 1977 PA study made a similar suggestion. Many participants in Consumer Focus Group Discussions also mentioned they were not confident when cooking fish and seafood and felt more recipe information was needed. Figure 4.5.4.2 shows that, on average, respondents "agreed somewhat" with the statement "I find fish easy to cook" and "there are enough recipes for fish and seafood". Nonetheless, the almost neutral stances on the other two statements shown indicate fish/seafood cooking and preparation still to be a problem for some.

Responses to the Figure 4.5.4.2 statements show some dependence upon demographics. Table 4.5.4.2 indicates that, while respondents are confident in cooking fish and seafood, younger respondents are not as confident as older respondents. This may already be depressing demand for fish and seafood amongst younger age groups and is particularly worrying given these are the respondents with young families who consume more foodstuffs than older age groups. Table 4.5.4.3 shows respondents from the lower socio-economic groups and retirees were more likely to "find fish easy to cook". Respondents from non-English speaking countries were far more likely to "like preparing fish and seafood" than Australians or people from English speaking countries.

**Table 4.5.4.2: Respondent Attitudes by Age Group:
Proportion of Respondents in Each Age Group**

Statement	Response	Respondent Age Group		
		Under 40 Yrs	40 - 59 Yrs	60+ Yrs
“I find fish easy to cook”	Agree Strongly	41%	50%	55%
“If I knew more ways to cook fish/seafood I would eat more”	Disagree Strongly	16%	24%	30%
“There are enough recipes for seafood”	Agree Strongly	28%	36%	36%

Table 4.5.4.3: Respondent Attitudes by Country of Origin and Socio-Economic Group: Proportion of Respondents Within Each Group

Statement	Response	Country of Origin*		Socio Economic Group					
		Aust or from English speaking country	From non-English speaking country	Upper and Upper Middle	Middle	Lower Middle	Lower	Retired White Collar	Retired Blue Collar
“I find fish easy to cook”	Agree Strongly	47%	50%	40%	46%	49%	48%	54%	53%
“I like preparing fish and seafood”	Agree Strongly	19%	30%	18%	20%	20%	23%	19%	21%

** all those who emigrated to Australia before their fifth birthday were classed as originating from Australian/English speaking country for the purposes of the study.*

Figure 4.5.4.3 groups statements concerning consumption occasion and fish/seafood attributes. As shown there is relatively strong agreement that fish/seafood is a light meal, especially from older respondents (Table 4.5.4.4). This perception may increase consumption of fish and seafood amongst those concerned with health and diet. On the other hand, many participants in Consumer Focus Groups mentioned their husbands preferred red meat since fish and seafood were seen as too light and “not filling”. The fairly neutral response to the statements “fish/seafood is less filling than chicken” (Figure 4.5.4.6) indicates that fish/seafood and chicken are seen as similar “filling” meals.

Bones in fish are seen as a problem by many respondents, particularly females and Australians/people from English speaking countries (Table 4.5.4.4).

Table 4.5.4.4: Respondent Attitudes by Sex, Age Group and Country of Origin

Statement	Responses	Respondent Sex		Age Group			Country of Origin*	
		Male	Female	Under 40 Yrs	40 - 59 Yrs	60+ Yrs	Aust or from English speaking country	From non-English speaking country
“Fish is for special occasions”	Disagree Strongly	34%	41%	37%	42%	39%	40%	33%
“Fish/seafood is good for a light meal”	Agree Strongly	38%	44%	36%	45%	51%	43%	40%
“I dislike fish with bones”	Agree Strongly	37%	47%	43%	45%	48%	46%	34%
“I eat fish/seafood because it is better for my health than red meat”	Agree Strongly	24%	30%	22%	33%	34%	27%	40%

** all those who emigrated to Australia before their fifth birthday were classed as originating from Australian/English speaking country for the purposes of the study.*

The widely publicised health advantages of fish/seafood over red meat do not show up strongly in respondents' attitudes to the statement "I eat fish/seafood because it is healthier than red meat" (Figure 4.5.4.3). While 56% of respondents agreed strongly or agreed somewhat with the statement, 43% were either neutral or disagreed with the statement. This may indicate that promotions such as "lean beef" are having some success in swinging public opinion back to seeing red meat as just as healthy as white meats. Table 4.5.4.4 does show that older respondents and respondents from non-English speaking countries are more likely to eat fish and seafood over red meat for health considerations.

Figure 4.5.4.4 and Table 4.5.4.5 show respondent concern over pollution contamination of fish/seafood was particularly strong. This response was reasonably consistent across all regions though regional New South Wales, Sydney, Perth, regional Queensland and Brisbane had the highest proportion of respondents who "agreed strongly" with the impact of pollution statement. Industry leader interviews conducted Australia-wide also indicated pollution was a major concern of industry, particularly in New South Wales and Queensland¹¹.

¹¹ see "Industry Leader Interview Report", PA Consulting Group, November 1991, Figure 2: 'Frequency Response by State', page 56

Table 4.5.4.5: Respondent Attitudes by Sex, Age Group and Country of Origin

Statement	Response	Respondent Sex		Age Group			Country of Origin*	
		Male	Female	Under 40 Yrs	40 - 59 Yrs	60+ Yrs	Aust or English speaking country	Non-English speaking country
"I am concerned about the impact of pollution on fish/seafood safety"	Agree Strongly	58%	68%	65%	67%	66%	66%	64%
"I like to try different types of fish/seafood"	Agree Strongly	18%	16%	19%	16%	11%	15%	20%
"I like to buy familiar types of fish/seafood"	Agree Strongly	31%	42%	34%	41%	48%	40%	38%
"I prefer Australian fish/seafood to imported products"	Agree Strongly	46%	55%	44%	57%	61%	54%	44%

* all those who emigrated to Australia before their fifth birthday were classed as originating from Australian/English speaking country for the purposes of the study.

Table 4.5.4.5 shows a higher proportion of female respondents to have strong concerns over pollution. Age group, country of origin and socio-economic group (not shown) had an insignificant effect upon responses.

Figure 4.5.4.4 also shows that, on average, respondents were almost neutral on the statements "fish costs so much that I eat it rarely". However, the distribution of responses, shown in Figure 4.5.4.5 shows a wide cross section of responses. Much of this divergence can be explained by the significant effect the respondents' household income had upon the respondents' response. 20% of respondents whose household income was less than \$15,000 per year agreed strongly with the statement versus only 5% of respondents whose household income was over \$60,000 per year who gave the same response. There was very little or no dependence upon respondent sex, age group, or nationality.

Response to the statement “I like to try different types of fish/seafood” was again almost neutral on average (Figure 4.5.4.4). Yet the distribution of responses again shows a wide divergence of views as shown in Figure 4.5.4.5.

19% of respondents under 40 years of age “agreed strongly” with the statement versus only 11% of respondents over 60 years of age (Table 4.5.4.5). Other demographic factors did not show a significant variation in response. Hence it seems that younger respondents are somewhat more adventurous than the older age groups.

Most respondents “like to buy familiar types of fish/seafood” (Figure 4.5.4.4) though again the younger respondents were more adventurous than older respondents (Table 4.5.4.5).

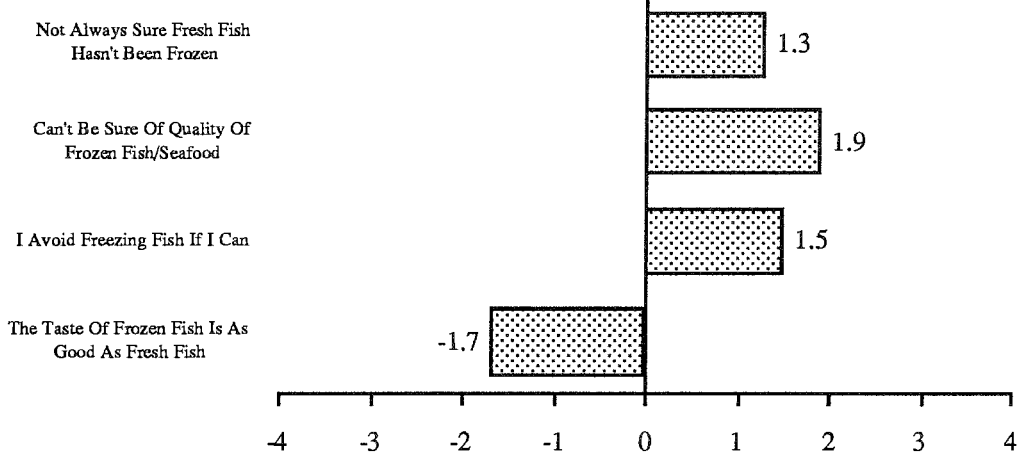
Figure 4.5.4.4 and Table 4.5.4.5 show most respondents preferred Australian to imported fish and seafood though this preference was stronger amongst older respondents, female respondents and Australians/people from English speaking countries.

Figure 4.5.4.1: *Respondent Attitude to:

(a) Statements On Availability :



(b) Statements On Frozen Vs. Fresh :



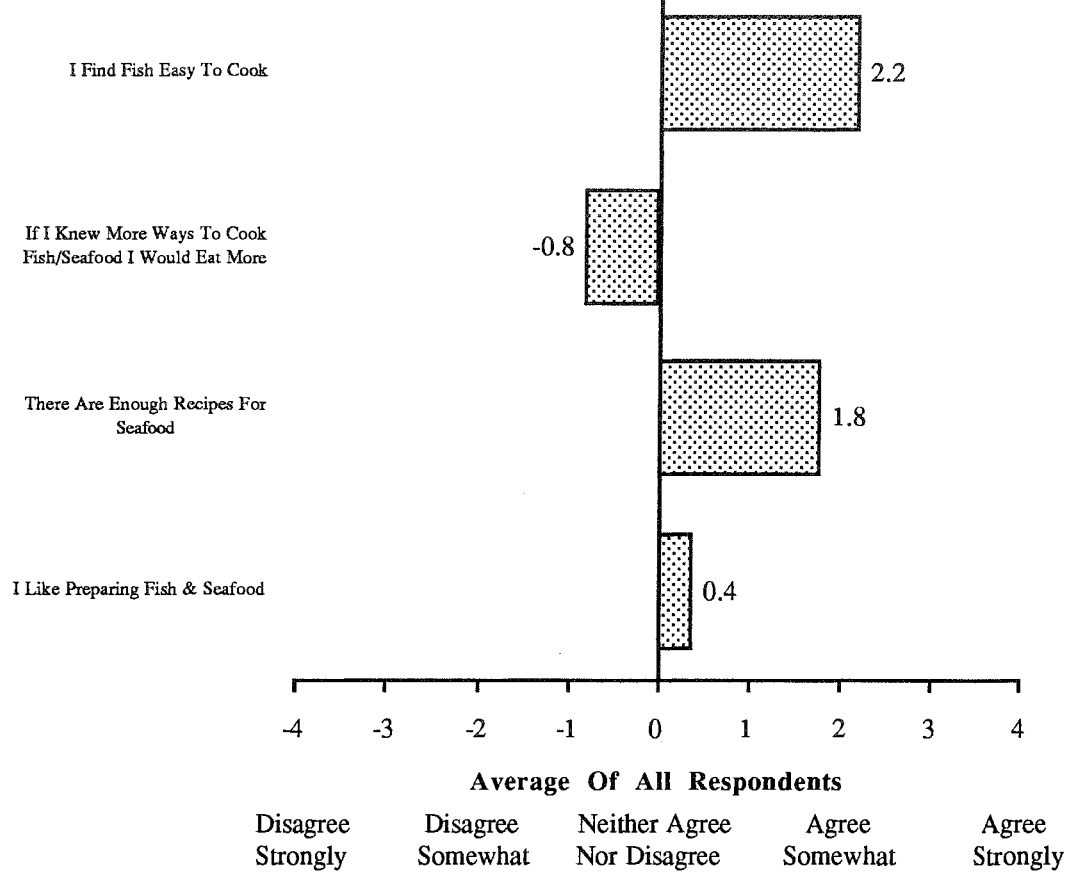
Average Of All Respondents

Disagree Strongly	Disagree Somewhat	Neither Nor Disagree	Agree Somewhat	Agree Strongly
----------------------	----------------------	-------------------------	-------------------	-------------------

** respondents from fish/seafood consuming households only.*

Figure 4.5.4.2: *Respondent Attitude to:

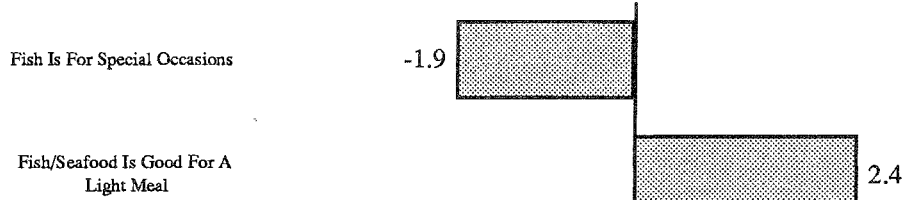
Statements On Preparation Of Fish/Seafood :



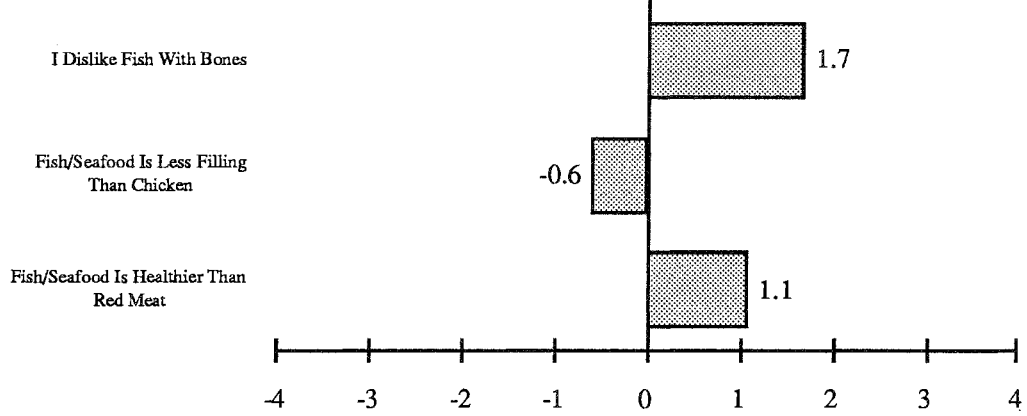
* respondents from fish/seafood consuming households only.

Figure 4.5.4.3: *Respondent Attitude to:

(a) Statements On Consumption Occasion Of Fish/Seafood :



(b) Statements On Attributes Of Fish/Seafood :



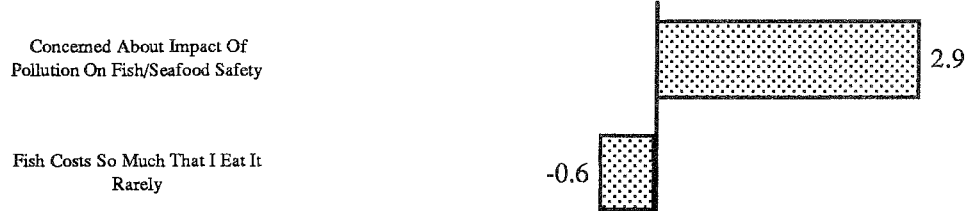
Average Of All Respondents

Disagree Strongly Disagree Somewhat Neither Agree Nor Disagree Agree Somewhat Agree Strongly

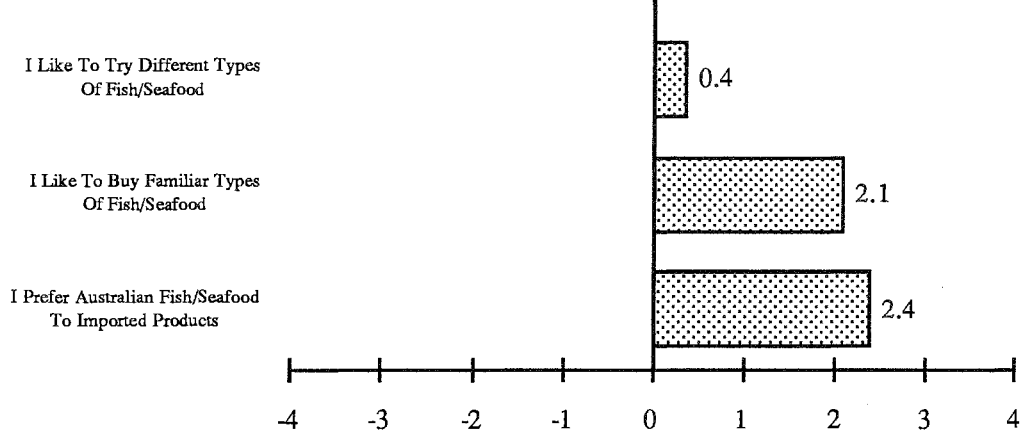
** respondents from fish/seafood consuming households only.*

Figure 4.5.4.4: *Respondent Attitude to:

(a) Statements On Problems/Worries Over Fish/Seafood :



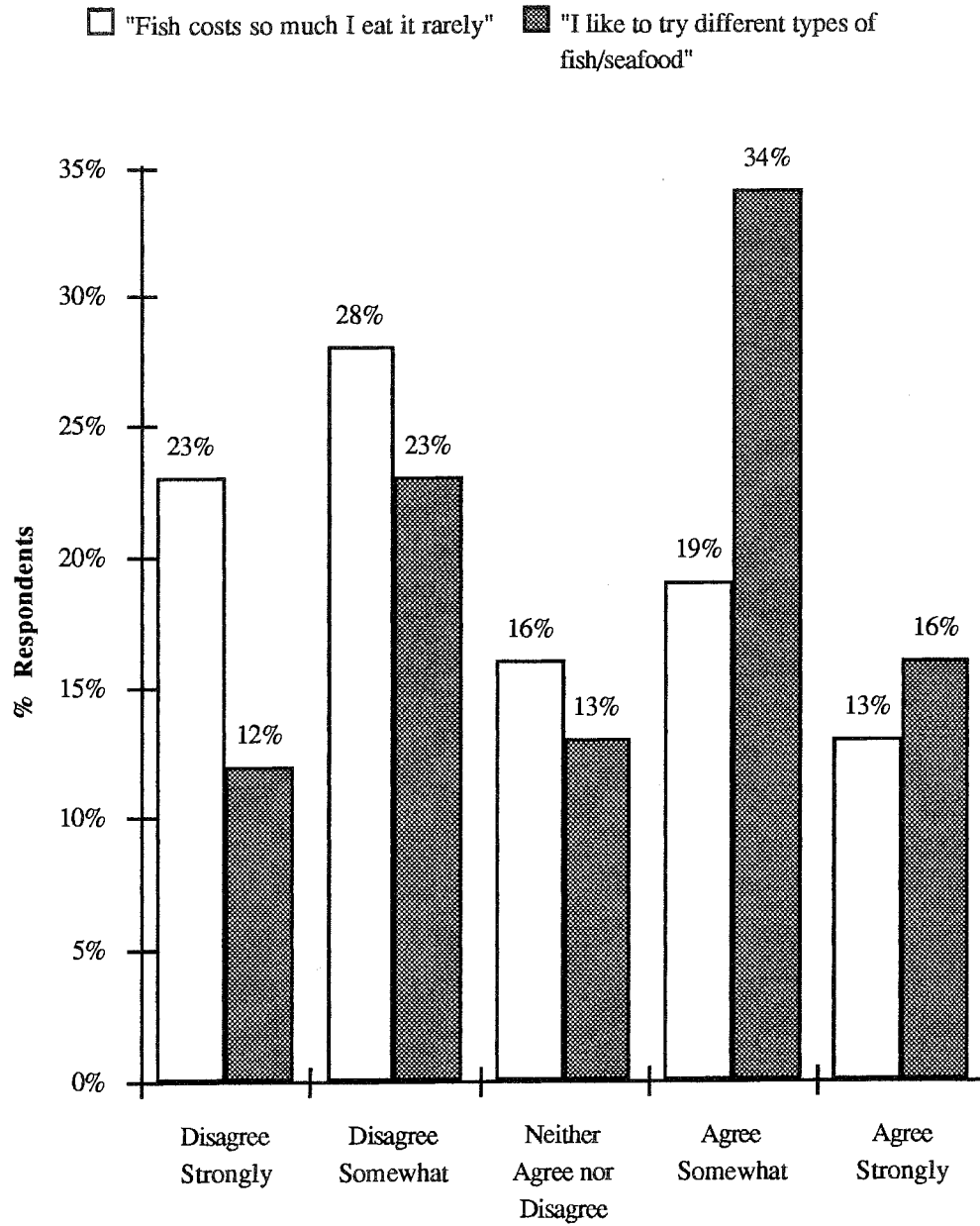
(b) Statements On Choice Of Fish/Seafood Type :



Average Of All Respondents

Disagree Strongly Disagree Somewhat Neither Agree Nor Disagree Agree Somewhat Agree Strongly

Figure 4.5.4.5: Distribution of Responses to the Statements: “Fish costs so much I eat it rarely” and “I like to try different types of fish/seafood”



4.5.5 Suggested Industry Actions to Increase Household Fish/Seafood Consumption

As part of the in-home survey, respondents were asked to suggest what actions the fishing industry needs to take to increase their households fish/seafood consumption. Figure 4.5.5.1 shows the 13 most common responses ranked by the proportion of respondents who gave each suggestion.

One third of respondents suggested that if the industry could reduce prices it would increase their household consumption of fish/seafood. 28.9% of respondents said nothing the industry could do would increase their household fish/seafood consumption. Better fish/seafood availability and more advertising and promotions were two other common suggestions.

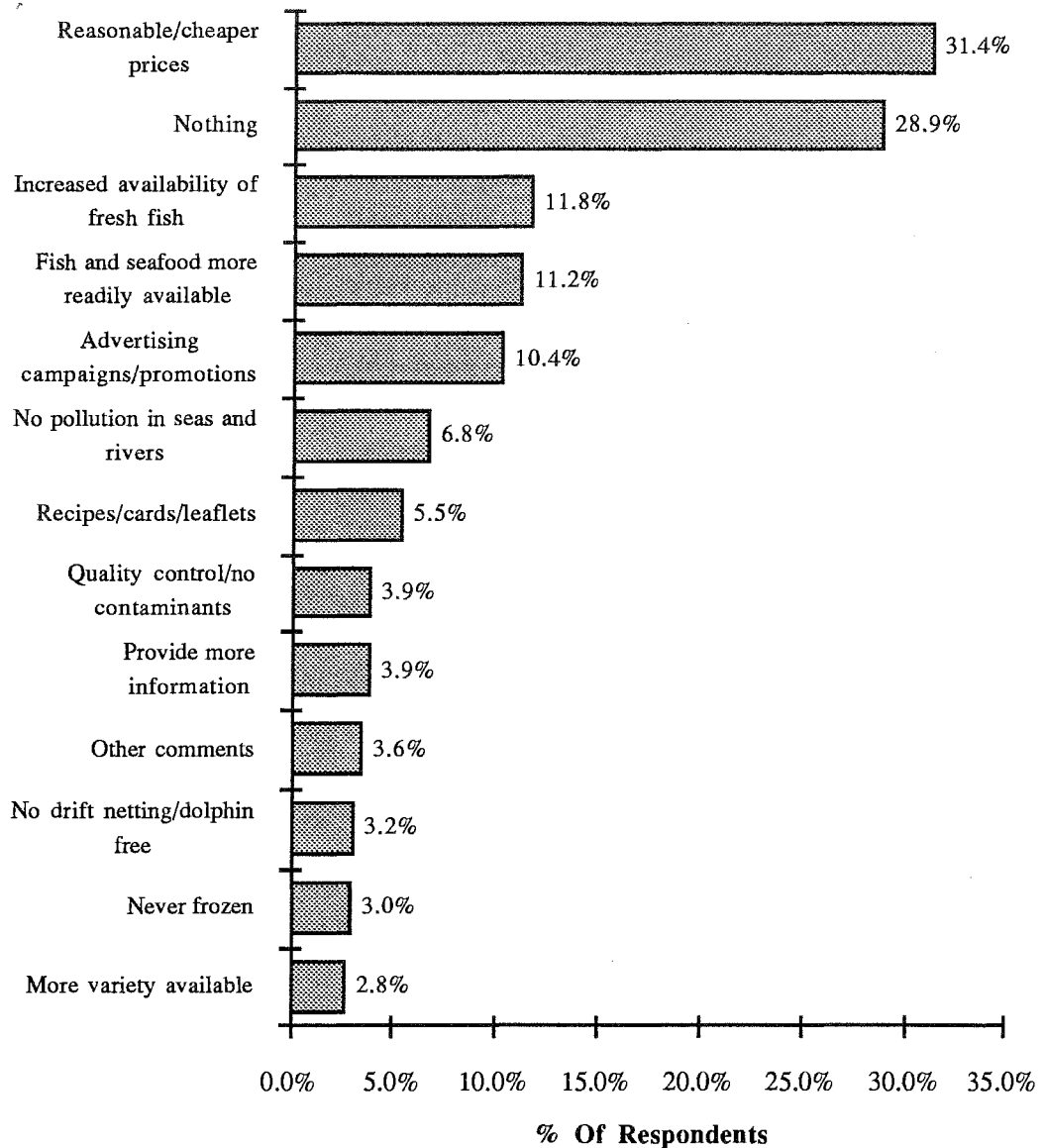
There was some dependence upon demographics in the suggestions given. Table 4.5.5.1 shows how respondents age group and household income played a role in responses given.

In general, younger respondents and those from higher income households tended to be more demanding of the fishing industry than those older and lower household income respondents. For example, a greater proportion of younger and higher (household) income respondents suggested increased fresh fish availability, advertising campaigns, recipe cards/leaflets and more information would lead to increased fish/seafood consumption in their households.

Table 4.5.5.1: Actions the Fishing Industry Needs to Take for My Household to Eat More Fish/Seafood by Demographics: Ranked by Proportion of Respondents

			Proportion of Respondents by Demographic Group:							
			Age Group			Household Income				
Rank	Fishing Industry Actions	Respondents (%)	Under 40 years	40 - 59 years	60 + years	Less than \$15,000	\$15,001 - \$25,000	\$25,001 - \$40,000	\$40,001 - \$60,000	More than \$60,000
1	Reasonable/cheaper prices	31	32	33	28	-----No difference-----				
2	Nothing	29	27	28	34	32	31	26	25	26
3	Increase fresh fish availability	12	12	13	10	9	12	13	12	13
4	Increase availability generally	11	13	11	9	9	11	11	13	15
5	Advertising campaign/promotions	10	13	11	6	6	10	12	14	16
6	No pollution in rivers/seas	7	-----No difference-----							
7	Recipe cards/leaflets	6	8	5	2	2	4	7	8	10
8	Be informative/ provide information	4	6	4	2	2	4	4	5	8
Average Number of Suggestions Per Respondent		1.46	1.53	1.47	1.33	1.34	1.44	1.51	1.56	1.61

Figure 4.5.5.1: Actions Which Need to be Taken to Increase Household Fish/Seafood Consumption: by Proportion of Respondents Surveyed*



** each respondent gave, on average, 1.46 suggestions*

4.6 Respondent Protein Source Preferences

4.6.1 Preferred Dishes by Meal-Occasion

In order to gauge the preferred dishes for in-home meals, respondents were asked to select as many as six dishes they would most likely prepare for a particular meal-occasion. The list of dishes from which the selection was made is as shown in Table 4.6.1.1. The particular meal-occasion that respondents were asked to choose dishes for was assigned by the interviewer to be appropriate to the composition of the household.

Each respondent was given only one meal-occasion for which to select dishes. Depending upon household composition, the meal-occasion given a respondent could have been any of those listed below:

- evening meal by self
- household evening meal
- weekend household meal - lunch
- entertaining entrée
- entertaining main
- children’s evening meal.

Table 4.6.1.1 explores any seasonal variation in dish type choice. In general, seasonal variation was only slight, if any. Soup as an option in “other” showed the highest seasonality and, as would be expected, was a far more popular choice in winter than summer.

Whole fish showed a seasonal decline in popularity in the winter (September 1991). This corresponds to the overall winter decline seen in the number of in-home fish/seafood serving occasions shown in Table 4.2.2.1. It may be related to the seasonal low in recreational fishing also falling in September as discussed in Section 4.10.1.

Table 4.6.1.2 shows responses to the meal choice question (after aggregation across all four quarters) for each meal-occasion. The first column sums responses across all meal-occasions and is the equivalent of the aggregate column in Table 4.6.1.1. It shows meat to be the most popular choice of dish followed by “other”, fish/seafood, poultry and, lastly pork. So, overall a fish/seafood dish was seen by respondents as a consideration for an in-home meal about half as many times as a meat dish.

The remaining six columns in Table 4.6.1.2 show that the dish selection is greatly affected by the meal-occasion. Most notable is fish/seafood’s 40% share of dish choices for an entertaining entrée. As the next Section 4.6.2 shows, most of these dishes were prawns.

Table 4.6.1.1 Respondent Dish Preferences Seasonal Variation: All Meal-Occasions; Proportion of All Respondents (%)

Meal Type	November 1991	March 1991	June 1991	September 1991	Aggregate
Meat:	36.6%	36.2%	36.5%	34.8%	36.0%
Sausages	5.0%	5.1%	4.8%	4.6%	4.9%
Lamb chops	6.4%	5.8%	5.9%	5.7%	5.9%
Steak	7.4%	7.4%	7.1%	6.8%	7.2%
Mince/rissoles	4.0%	4.8%	4.7%	4.3%	4.4%
Casserole or curry	4.4%	3.6%	4.1%	4.0%	3.9%
Lamb for roast	5.7%	5.6%	5.9%	5.7%	5.8%
Beef short cuts/pieces	1.9%	1.9%	2.3%	1.9%	2.0%
Veal	1.9%	1.9%	1.7%	1.8%	1.9%
Pork:	5.2%	5.4%	5.1%	5.1%	5.2%
Pork chops	3.0%	3.0%	2.7%	2.9%	2.9%
Pork for roast	2.2%	2.4%	2.4%	2.3%	2.3%
Poultry:	16.2%	16.1%	15.8%	15.8%	15.9%
Whole chicken	7.4%	7.8%	6.9%	6.8%	7.3%
Chicken fillet/pieces	8.8%	8.3%	8.9%	9.0%	8.7%
Fish/Seafood:	19.3%	19.5%	18.2%	18.6%	18.9%
Canned fish	3.3%	3.8%	3.2%	2.9%	3.3%
Whole fish	3.0%	3.2%	2.7%	2.3%	2.8%
Fish fillet	5.6%	5.6%	5.9%	6.0%	5.8%
Smoked cod	0.6%	0.6%	0.7%	0.6%	0.6%
Fish fingers	1.2%	1.2%	1.2%	1.2%	1.2%
Salmon (not canned)	1.0%	0.8%	0.6%	0.8%	0.8%
Prawns (not canned)	3.4%	3.5%	3.0%	3.5%	3.4%
Scallops	1.1%	0.8%	0.9%	1.2%	1.0%
Other:	22.6%	22.8%	24.4%	25.7%	23.9%
Pasta dish	8.6%	9.0%	8.7%	8.8%	8.8%
Vegetarian	3.1%	2.9%	3.1%	3.5%	3.2%
Sandwich bread	3.7%	4.1%	3.9%	4.1%	3.9%
Pies/pasties	2.1%	2.0%	1.9%	2.1%	2.0%
Canned vegetables/meat	0.5%	0.5%	0.4%	0.6%	0.5%
Soup	4.6%	4.3%	6.3%	6.7%	5.5%
Other	0.0%	0.0%	0.0%	0.0%	0.0%
Total dish choices(%)	100.0%	100.0%	100.0%	100.0%	100.0%
No. of dish choices ('000s)	23,392	22,518	23,470	23,195	23,102
Average number of dish choices/respondent	4.5	4.3	4.5	4.4	4.4

Table 4.6.1.2: Dishes Grocery Buyers Would Most Likely Prepare: Proportion of All Dish Choices (%)

Major types	All meal occasions (proportion of dish choices, %)	Evening meal by self (proportion of dish choices, %)	Household evening meal (proportion of dish choices, %)	Weekend household meal-lunch (proportion of dish choices, %)	Entertaining entrée (proportion of dish choices, %)	Entertaining main (proportion of dish choices, %)	Children's evening meal (proportion of dish choices, %)
Meat	36%	36%	46%	29%	11%	38%	45%
Pork	5%	5%	7%	3%	1%	9%	4%
Poultry	16%	14%	17%	14%	11%	21%	16%
Fish/seafood	19%	19%	15%	13%	40%	17%	15%
Other	24%	25%	15%	40%	37%	15%	20%
Total* (%)	100%	99%	100%	99%	100%	100%	100%
No. of dish choices ('000s)	23,102	5,026	5,157	3,152	2,724	3,907	3,136
Average no. of dish choices/ respondent	4.4	4.6	5.3	3.8	3.3	4.4	5.2

* some columns do not add to 100% due to rounding.

4.6.2 Fish/Seafood Meals Respondents Would Most Likely Prepare

Section 4.6.1 provided a breakdown of dishes respondents would most likely prepare under the five main categories of meat, pork, poultry, fish/seafood and "other". As Table 4.6.1.1 shows, within the five major categories are a variety of common dishes such as sausages or lamb chops in the meat category and fish fillet and smoked cod in the fish/seafood category. Hence this Section details the responses within the fish/seafood category by meal-occasion.

Figure 4.6.2.1 shows fish fillet to be the most popular choice over all fish/seafood meal-occasions. Otherwise prawns, canned fish and whole fish were the most popular choices.

Figures 4.6.2.2 to 4.6.2.7 show the choice of fish/seafood dishes to be highly occasion specific. The popularity of canned fish at lunch is confirmed in Figure 4.6.2.4. Prawns and, to a lesser extent, scallops are very popular choices for an entertaining entrée. Fish fillets and fish fingers rate highly for children's evening meals.

Figure 4.6.2.1: Fish/Seafood Dishes Most Likely to Prepare: All Meal-Occasions: Proportion of Total Dish Choices Made (%)

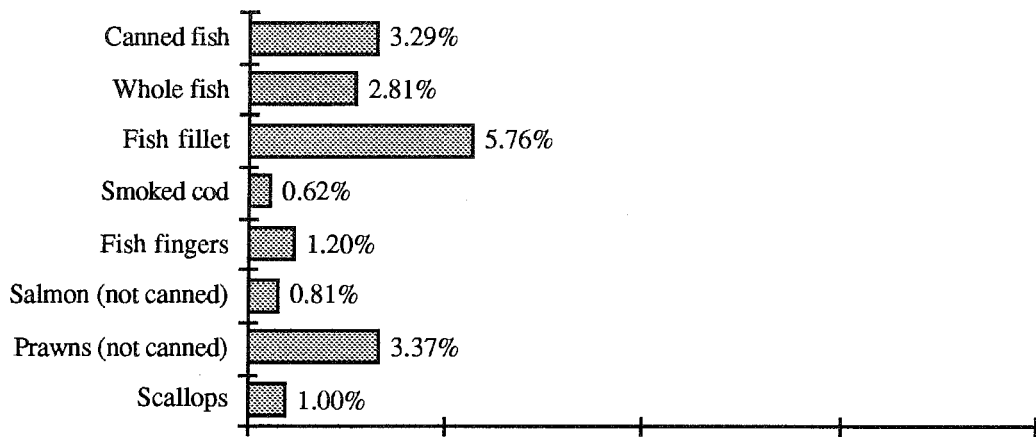


Figure 4.6.2.2: Fish/Seafood Dishes Most Likely to Prepare: Evening Meal by Self: Proportion of Total Dish Choices Made (%)

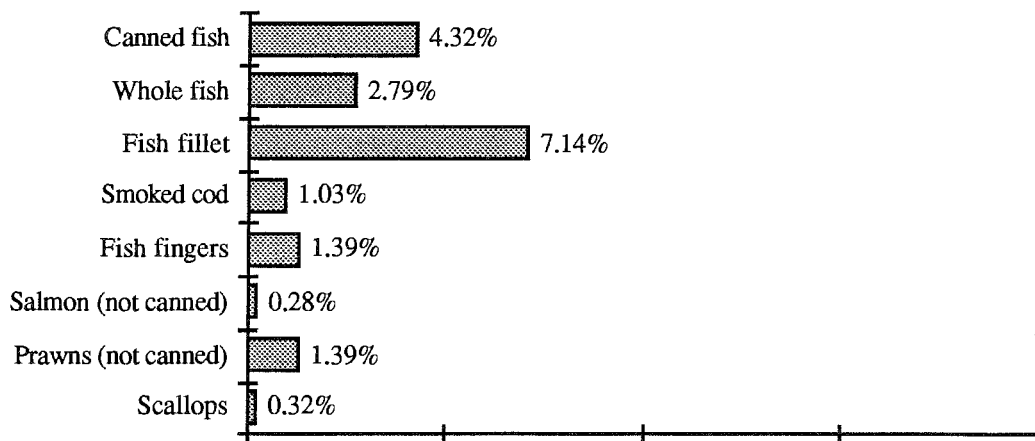


Figure 4.6.2.3: Fish/Seafood Dishes Most Likely to Prepare: Household Evening Meal: Proportion of Total Dish Choices Made (%)

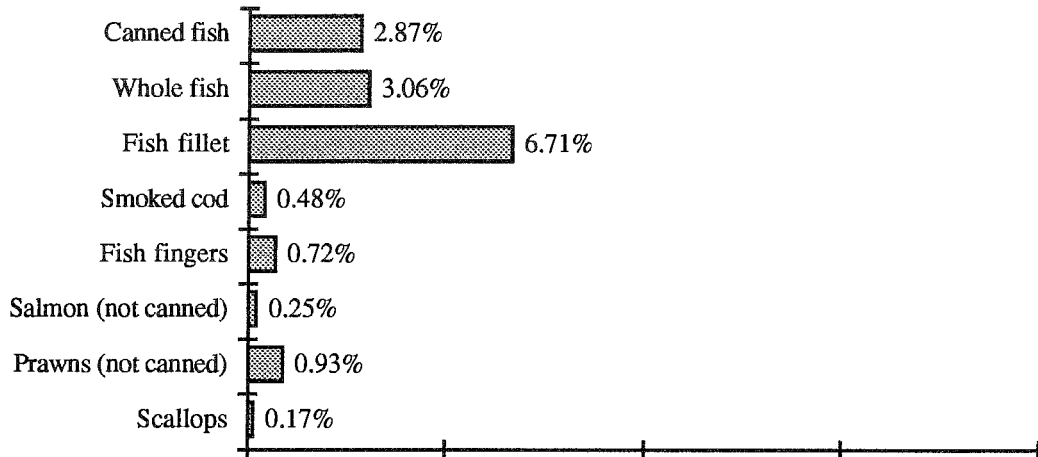


Figure 4.6.2.4: Fish/Seafood Dishes Most Likely to Prepare: Weekend Household Meal - Lunch: Proportion of Total Dish Choices Made (%)

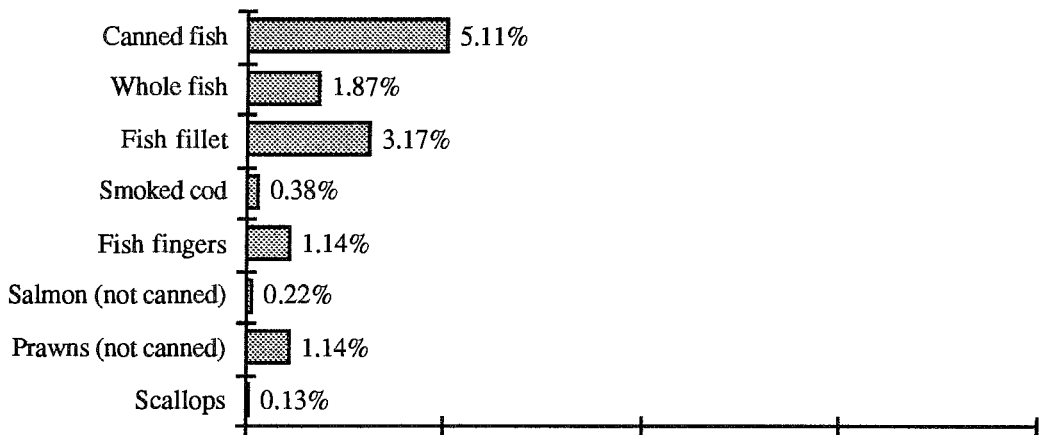


Figure 4.6.2.5: Fish/Seafood Dishes Most Likely to Prepare: Entertaining Entrée: Proportion of Total Dish Choices Made (%)

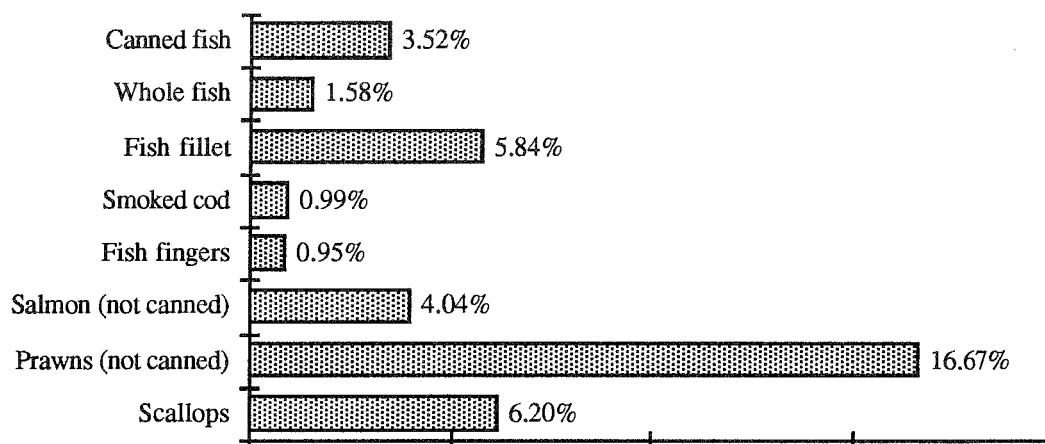
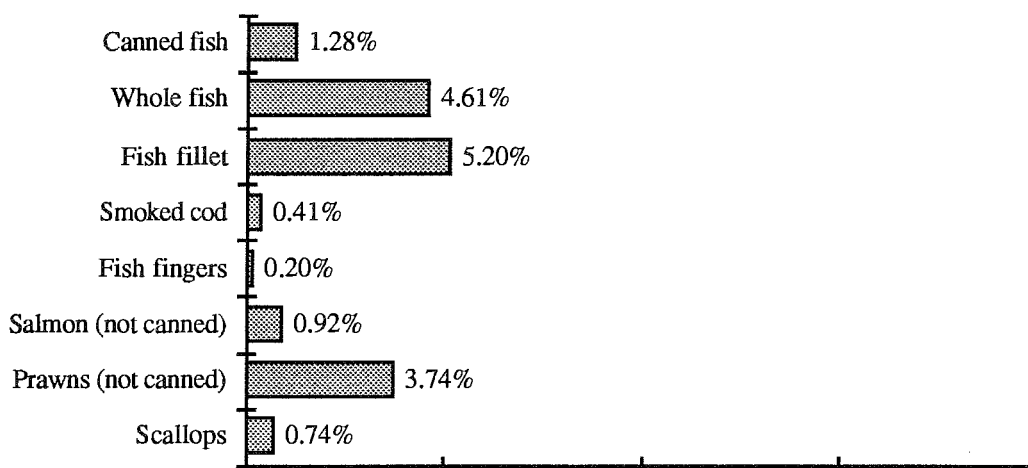
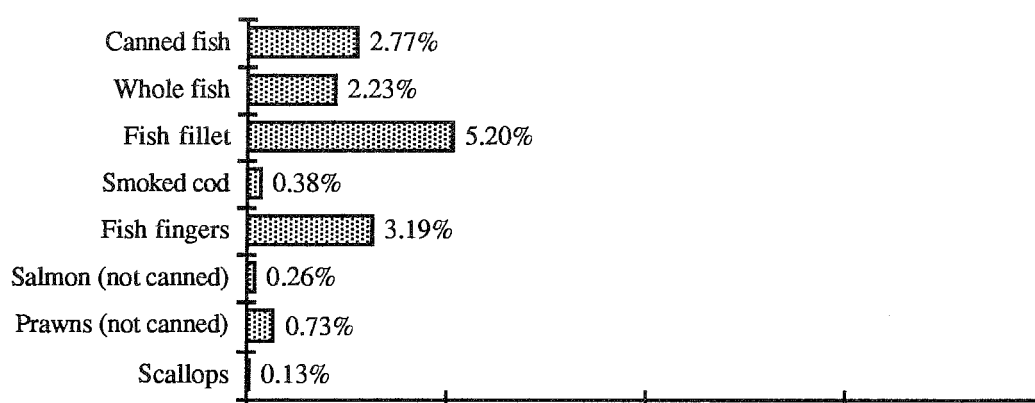


Figure 4.6.2.6: Fish/Seafood Dishes Most Likely to Prepare: Entertaining Main: Proportion of Total Dish Choices Made (%)



**Figure 4.6.2.7: Fish/Seafood Dishes Likely to Prepare:
Children’s Evening Meal: Proportion of Total Dish
Choices Made (%)**



4.6.3 Perceptions of Selected Dishes by Meal-Occasion

The meal-occasion on which respondents gave their preferred dishes (Sections 4.6.1 and 4.6.2) was also used for another question. For this meal-occasion, respondents were challenged on how well 16 statements matched a range of eight given dishes. Respondents were also given the option of answering that a statement matched “none” of the dishes or that they “don’t know”.

The key results from this questioning for each six meal-occasions are summarised in Table 4.6.3.1. The left hand column lists the meal-occasions - one of which was assigned to each respondent. The next column entitled “dishes considered” lists the range of eight dishes upon which respondents were questioned.

The remaining columns represent 15 of the 16 statements respondents were asked to match with the eight dishes. The numbers alongside the dish abbreviations in these columns are proportions of respondents. Hence, of those respondents assigned the “evening meal by self” meal-occasion (the first row of the Table), 57% matched the fish fillet dish with “contains little fat” (see under “Health Issues” heading) and so on.

The dishes shown in each square of the Table are generally those dishes that were matched by the highest proportion of respondents except in cases where all dishes were matched to a statement by less than 10% of respondents approximately - then the comment “all low” is placed in the square.

Key results are discussed under the headings below which are consistent with the order of the columns in Table 4.6.3.1.

Health issues

Fish fillet and whole fish were consistently the dishes most strongly associated with “containing little fat”. Other fish/seafood dishes such as canned fish, salmon (not canned), prawns, and scallops showed moderate association, along with several other non-fish/seafood dishes such as pasta, whole chicken, and chicken fillet/pieces.

In spite of moderate association with “little fat”, many of these dishes were strongly associated with being “a healthy meal” along with fish fillet and whole fish. For example, for the weekend household lunch meal-occasions, whole chicken was seen by 29% of respondents as “containing little fat”. However, it was far more strongly associated with being “a healthy meal” (64% of respondents). Steak also was seen by 50% of respondents as “a healthy meal” versus 22% who thought it “contained little fat”.

Popularity with diners

Chicken in the form of whole chicken or chicken fillet pieces and steak were most strongly associated with being “popular with people who will be eating the meal” for three out of the six meal-occasions.

Fish fillet was seen by more respondents as being popular with diners at an evening meal by self.

However, other fish/seafood dishes had only moderate association with diner popularity. For example, as an entertaining main, whole fish (39%) and prawns (39%) were the dishes seen by relatively few respondents as being popular with diners (compared with other dishes).

The popularity of prawns appears to be highly meal-occasion specific as it was seen by more respondents than any other dish as being popular as an entertaining entrée.

Is not a filling meal

None of the dishes were linked strongly to this characteristic. However, the fish/seafood dishes were consistently seen by a greater proportion of respondents as having this characteristic. For example, for a household evening meal, canned fish was seen by 18% of respondents as “not a filling meal”.

Has a taste that is disliked

Few respondents saw this as a problem with any dishes. However most fish/seafood dishes were seen by a greater proportion of respondents as “having a taste that is disliked”. This specifically relates to fish fingers, canned fish, prawns and scallops.

Its quality is too variable

Sausages and steak were seen by about one quarter of respondents as having “quality that is too variable”.

Fish and seafood dishes were generally seen by far fewer respondents as having quality variability problems. However, for the entertaining entrée meal-occasion, prawns and fish fillet were seen by 20% and 18% of respondents respectively as having quality variability problems.

Is readily available to buy

All dishes were seen by most respondents as being “readily available to buy”. However, prawns, salmon (not canned) and scallops were seen by fewest respondents as “being readily available to buy”.

Is too expensive for the meal

For three out of the six meal-occasions, prawns were seen by about half the respondents as being “too expensive for the meal” ahead of any other dish.

Other fish/seafood dishes were generally seen as being “too expensive” by a higher proportion of respondents than was the case for the alternate dishes. However, in three out of six meals, steak was seen by about one quarter of respondents as being “too expensive”.

For these three meal-occasions this put steak ahead of whole fish and/or fish fillet in terms of the proportion of respondents who saw the dish as “too expensive for the meal”.

Something I would buy only on special

Results accorded to this statement were very similar to those under the “is too expensive for the meal” statement.

I don't have the knowledge to buy it confidently

Only the fish/seafood dishes were seen by some respondents as presenting a problem in this regard. For example, for a weekend household lunch, 13% of respondents saw their lack of knowledge of whole fish as a problem when purchasing.

For the entertaining entrée and entertaining main meal-occasions almost one fifth of respondents had little knowledge of scallops and whole fish respectively.

It isn't easy to prepare for cooking

Whole fish and, to a lesser extent, scallops and prawns, were seen by more respondents as “not easy to prepare for cooking” than was the case for any other dish.

I need more information about its cooking

For a weekend household lunch and an entertaining main 11% and 15% of respondents respectively sought more information about whole fish cooking. Far fewer respondents sought cooking information for other dishes.

I don't mind cooking it

Most respondents agreed they “don't mind cooking” most of the dishes listed in the questionnaire. However, generally fewer respondents agreed to this statement in relation to the fish/seafood dishes.

For example, for the entertaining main meal-occasion, less than half respondents agreed they “don't mind cooking” whole fish (48%) and prawns (41%).

There is a lot of wastage as can't eat it all

Approximately one quarter of respondents associated this problem with dishes that had a large proportion of bone such as lamb chops, pork chops and whole chicken. About one third of respondents saw this as a problem with prawns.

Whole fish and whole chicken were also seen as having this problem by up to one fifth of respondents.

It presents a problem with waste disposal

Dishes bought in cans - canned fish and canned vegetables/meat, were seen by up to one fifth of respondents as presenting a problem in this area. Prawns were also seen as presenting this problem by approximately one third of respondents. Other dishes were not seen as presenting problems with waste disposal.

I can cook it in the microwave

The key results for this statement are shown in Table 4.6.3.2 using the same abbreviations used in Table 4.6.3.1. Again only the results for dishes eliciting the highest proportion of matches are shown. Also shown are the “don’t know” and “none” responses which consistently total about 50% of respondents for all meal-occasions.

The dishes that attract the highest proportion of respondents agreeing that they “can cook it in the microwave” are the chicken dishes, pies/pasties, vegetarian dishes, pasta and fish dishes. However, these dishes attract only one quarter to one third of respondents agreeing that they can cook them in the microwave.

While half of Australian households do not have a microwave oven¹², the responses still indicate a relatively low usage of microwaves for cooking in Australian households.

¹² Figures provided by MINTEL Australia, Melbourne, November 1991 showing 52% penetration of microwaves in Australian households in 1990, up from 21% in 1985.

Appendix VII

Fish and Seafood Consumption Standard Errors

Estimates of Standard Errors Associated with the Mean Amount of Fish and Seafood Eaten In-Home

- estimates of the standard errors and 95% confidence limits for the mean values of in-home fish and seafood consumption, are given in the following table
- standard errors are expressed as a percentage of the mean consumption figures calculated for each region
- confidence limits are expressed in kilograms
- standard error estimates are provided with two caveats outlined below.

In using these standard error estimates, two points need to be noted.

1. Shape of the Distribution

- the distribution of weights of fish and seafood consumed is positively skewed, that is, they are not evenly distributed around the mean in a “bell shaped curve”. What this means, is that more people reported eating smaller amounts of fish and seafood:
 - a consequence of “skewness” is that the mean will not be a truly unbiased estimate of “average consumption”, and should therefore be considered as a guide to the “average” amounts of fish and seafood eaten by the populace
 - standard deviations are exaggerated in a skewed distribution, leading to inflated estimates of standard errors
 - the inflated estimate of the standard error means that observed figures of consumption should fall within $\pm 1.96 \times \text{S.E.}$ with at least 95% confidence.

2. The Presence of Outliers and Sample Revision

- the amounts of fish and seafood consumed as reported by respondents in this sample contain values that are very extreme. These extreme values, known as “outliers”, have been removed, or “trimmed”, from the sample
 - trimming is a common statistical practice, and allows more reliable estimates of the standard error of the mean to be made
 - whether these outliers represent estimation inaccuracies or the presence of people that eat extraordinary amounts of fish and seafood cannot be strictly determined
 - the trimmed sample used for the calculation of standard error estimates is based on individual consumption figures that were less than 5000 gms/week/respondent for fish consumption, and less than 2000 gms/week/respondent for seafood consumption. The trimmed sample utilised 99.23% of the data contained in the original sample of 6000 respondents
 - removing outliers does not alter the fact that the distribution of consumption figures is positively skewed.
- **95% confidence limits for the weighted consumption figures can be obtained as follows:**

mean regional consumption estimate ± 1.96 x (regional standard error)

or, if confidence limits need to be known in gravimetric terms, according to:

mean regional consumption estimate ± 1.96 x (regional s.e. % x mean regional consumption estimate).

Estimate of the Standard Error Associated with the Mean Amount of Fish and Seafood Eaten Out-of-Home

No estimates of the standard errors associated with the out-of-home consumption of fish and seafood have been reported. This is because many respondents to the out-of-home consumption questionnaire were unable to estimate the weight of the fish or seafood that they consumed. Therefore, the coding team had to estimate the weight consumed using standard estimates for the main variety of fish and seafood. Hence, the variability in the survey data is judged to be lower than that which would be expected in the real-life consumption of fish and seafood in the out-of-home situation. Consequently the estimates of standard error would be artificially low.

Confidence Limits and Standard Errors of Mean In-Home Fish Consumption

		TOTAL	SYDNEY	REG NSW	MELBOURNE	REG VIC	BRISBANE	REG QLD	ADELAIDE	REG SA	PERTH	REG WA	CANBERRA	HOBART	REG TAS
TOTAL CONSUMPTION	Annual per capita in-home consumption	8.04	8.92	8.66	7.59	5.53	7.37	7.64	7.58	8.08	10.81	7.55	6.39	8.58	7.06
	FISH AND SEAFOOD														
	95% confidence lower limit	7.74	8.10	7.64	6.97	4.64	6.43	6.43	6.63	6.31	9.45	5.92	5.34	7.03	5.26
	95% confidence upper limit	8.34	9.74	9.68	8.21	6.42	8.31	8.85	8.53	9.85	12.17	9.18	7.44	10.13	8.86
ANNUAL FISH CONSUMPTION	Annual per capita in-home consumption	6.94	7.37	7.37	6.71	4.94	6.53	6.88	6.45	6.86	9.41	6.71	5.62	7.16	6.04
	95% confidence lower limit	6.67	6.65	6.46	6.13	4.11	5.65	5.73	5.62	5.29	8.19	5.20	4.63	5.77	4.41
	95% confidence upper limit	7.21	8.09	8.28	7.29	5.77	7.41	8.03	7.28	8.43	10.63	8.22	6.61	8.55	7.67
ANNUAL SEAFOOD CONSUMPTION	Annual per capita in-home consumption	1.10	1.54	1.29	0.88	0.58	0.84	0.75	1.12	1.22	1.40	0.83	0.77	1.41	1.01
	95% confidence lower limit	1.00	1.26	0.94	0.66	0.28	0.57	0.42	0.71	0.36	0.92	0.37	0.48	0.80	0.44
	95% confidence upper limit	1.20	1.82	1.64	1.10	0.88	1.11	1.08	1.53	2.08	1.88	1.29	1.06	2.02	1.58
STANDARD ERRORS	S.E. fish consumed in-home	2.00	5.00	6.30	4.40	8.60	6.90	8.50	6.60	11.70	6.60	11.50	9.00	9.90	13.80
	S.E. seafood cons in-home	4.80	9.40	13.70	12.90	26.00	16.60	22.20	18.60	36.00	17.40	28.20	19.40	21.90	29.00
	S.E. total seafood cons in-home	1.90	4.70	6.00	4.20	8.20	6.50	8.10	6.40	11.20	6.40	11.00	8.40	9.20	13.00
1.96 X S.E.	1.96z x s.e. fish in-home	3.92	9.80	12.35	8.62	16.86	13.52	16.66	12.94	22.93	12.94	22.54	17.64	19.40	27.05
	1.96z x seafood in-home	9.41	18.42	26.85	25.28	50.96	32.54	43.51	36.46	70.56	34.10	55.27	38.02	42.92	56.84
	1.96z x total seafood in-home	3.72	9.21	11.76	8.23	16.07	12.74	15.88	12.54	21.95	12.54	21.56	16.46	18.03	25.48

Table 4.6.3.1: Summary Key Results of Respondent Perceptions of Selected Dishes: by Meal Occasion: Proportion of Respondents (%)

Meal Occasion	Dishes Considered	Health Issues						Purchase/Preparation/Cooking/Disposal																					
		Contains little fat		Is a healthy meal		Is popular with people who will be eating the meal		Is not a filling meal		Has a taste that is disliked		Its quality is too variable		Is readily available to buy		Is too expensive for the meal		Something I would buy only on special		I don't have the knowledge to buy it confidently		It isn't easy to prepare for cooking		I need more information about its cooking		I don't mind cooking it		There is a lot of wastage as can't eat it all	
Evening meal by self	CF, Past, Saus, LC, Fillet, FF, Veg, P/P	Fillet 57 CF 35 FF 14	Fillet 68 CF 35 FF 21	Fillet 51 CF 28 FF 22	Fillet 16 CF 10 LC 3	FF 18 CF 16 Saus 13 Fillet 6 LC 5	Saus 25 Fillet 13 LC 10 CF 10 FF 7	All high Fillet 78 FF 78 CF 80	Fillet 15 CF 9 LC 9 FF 3 Saus 2	Fillet 11 CF 11 FF 6 LC 8 Saus 3	Fillet 7 Veg 7 Past 7 CF 6 Saus 3	All low	All low	LC 55 Saus 50 Fillet 52 FF 40 CF 37	LC 24 all others low	CF 17 all others low													
Household evening meal	CF, Past, Saus, Stk, PC, Fillet, WC, LR	Fillet 61 CF 37 WC 27 Stk 22	Fillet 71 WC 58 LR 50 CF 40	WC 58 Stk 54 LR 54 Fillet 43 CF 25	CF 18 Fillet 9 WC 3 Stk 2	CF 20 Saus 13 PC 10 Fillet 8 Stk 3	Saus 23 Stk 19 Fillet 10 CF 8 WC 6	All high	Stk 25 LR 15 Fillet 12 PC 12 CF 4 Past 1	Stk 17 LR 15 PC 11 Fillet 10 CF 9 Past 3	Fillet highest at 8	Past highest on 9	All low	Stk 60 WC 58 Fillet 54 CF lowest on 44	WC 22 PC 19 LR 14 all others low	CF 14 WC 12 all others low													
Weekend Household Meal - lunch	CF, Past, Stk, WF, WC, LR, P/P, Prwn	WF 63 Prwn 36 CF 36 WC 29 Stk 24	WF 74 WC 64 Stk 50 CF 41 Prwn 38	WC 62 LR 56 Stk 51 WF 41 Prwn 33 CF 27	Prwn 16 CF 13 WF 5 WC 2 Stk 2	CF 20 Prwn 14 WF 9 P/P 7 WC 4 Stk 2	Stk 20 WF 15 Prwn 14 P/P 11 WC 7	WC highest 86 Prwn lowest 67	Prwn 52 Stk 26 LR 21 WF 15 WC 8 CF 4	Prwn 37 Stk 14 LR 13 CF 6 Stk 3 WC 2	WF 13 Prwn 11 CF 6 Stk 3 WC 2	WF 17 Prwn 14 WC 6 Stk 4	WF 11 Prwn 6 Past 6 WC 3 Stk 2	WC 65 Stk 64 LR 63 Past 61 WF 53 CF 47 Prwn 45	Prwn 28 WC 20 WF 12 Stk 2	Prwn 25 CF 13 WC 9 WF 9 Stk 1													
Entertaining Entrée	Past, Fillet, Veg, BSC, Sal, Prwn, Scall, Sp	Fillet 60 Veg 59 Sal 41 Prwn 40 Scall 32 BSC 25	Veg 75 Fillet 70 Sal 50 BSC 46 Prwn 46 Scall 42	Prwn 57 Past 52 Sal 34 Veg lowest 32	Sp 20 others low	Scall 16 Sal 13 Prwn 8 others lower	Prwn 20 Fillet 18 BSC 17 Scall 14	BSC 80 Past 79 Fillet 78 Prwn 66 Sal 62 Scall lowest 60	Prwn 43 Scall 32 Sal 31 Prwn were the 3 highest Fillet 8	Prwn 39 Scall 26 Sal 26 Prwn were the 3 highest Fillet 9	Scall 18 Sal 16 Prwn 11 others low	Scall 13 Prwn 12 Sal 9 other lower	Scall 17 Veg 14 Sal 12 Past 10	Past 64 Three lowest are: Prwn 66 Sal 62 Scall 60	Prwn 35 others low	Prwn 32 others low													
Entertaining Main	Past, Stk, WF, Fillet, CF/P, PR, V, Prwn	Fillet 60 WF 53 CF/P 38 others lower	Fillet 73 WF 70 CF/P 64	CF/P 65 Stk 55 Fillet 44 2 of lowest are: WF 39 Prwn 39	Prwn 25 Fillet 10 all others low	Prwn 14 PR 10 V 10 WF 8 Fillet 7	Stk 26 WF 17 Prwn 13 Fillet 12 others low	All high though prawns @ 69 is lowest	Prwn 44 Stk 18 others below 11	Prwn 31 PR 18 Stk 12 others below 11	WF 17 Prwn 15 V 11 Fillet 9 others low	WF 20 Prwn 13 others low	WF 15 Prwn 11 Past 9 others low	All high though lowest are: Fillet 54 WF 48 V 47 Prwn 41	Prwn 31 WF 19 others low	Prwn 29 WF 16 others low													
Children's Evening Meal	CF, Past, Saus, M/R, Fillet, FF, P/P, CV/M	Fillet 65 CF 42 Past 38 CV/M 20 FF 16	Fillet 74 Past 60 CF 36 CV/M 24 FF 21	Past 59 Saus 49 M/R 48 Fillet 40 FF 34 CF 24	FF 19 CF 14 CV/M 14 P/P 14 others low	CV/M 31 CF 23 FF 13 Fillet 10 others low	Saus 24 M/R 19 Fillet 14 CF 12 FF 10	All high	Fillet 19 all others low	Fillet 15 CF 11	All low	All low	All low	All high though lowest are: CF 49 CV/M 45	All low	CV/M 19 CF 18 others low													

Note: BSC = beef short cut pieces; LC = lamb chops; Prwn = prawns; V = veal;
 CF = canned fish; LR = lamb roast; Sal = salmon (not canned); Veg = vegetarian dish;
 CF/P = chicken fillet/pieces; M/R = mince/rissoles; Saus = sausages; WC = whole chicken;
 CV/M = canned vegetables/meat; P/P = pie/pasty; Scall = scallops; WF = whole fish;
 FF = fish fingers; Past = pasta; Sp = soup; Stk = steak;