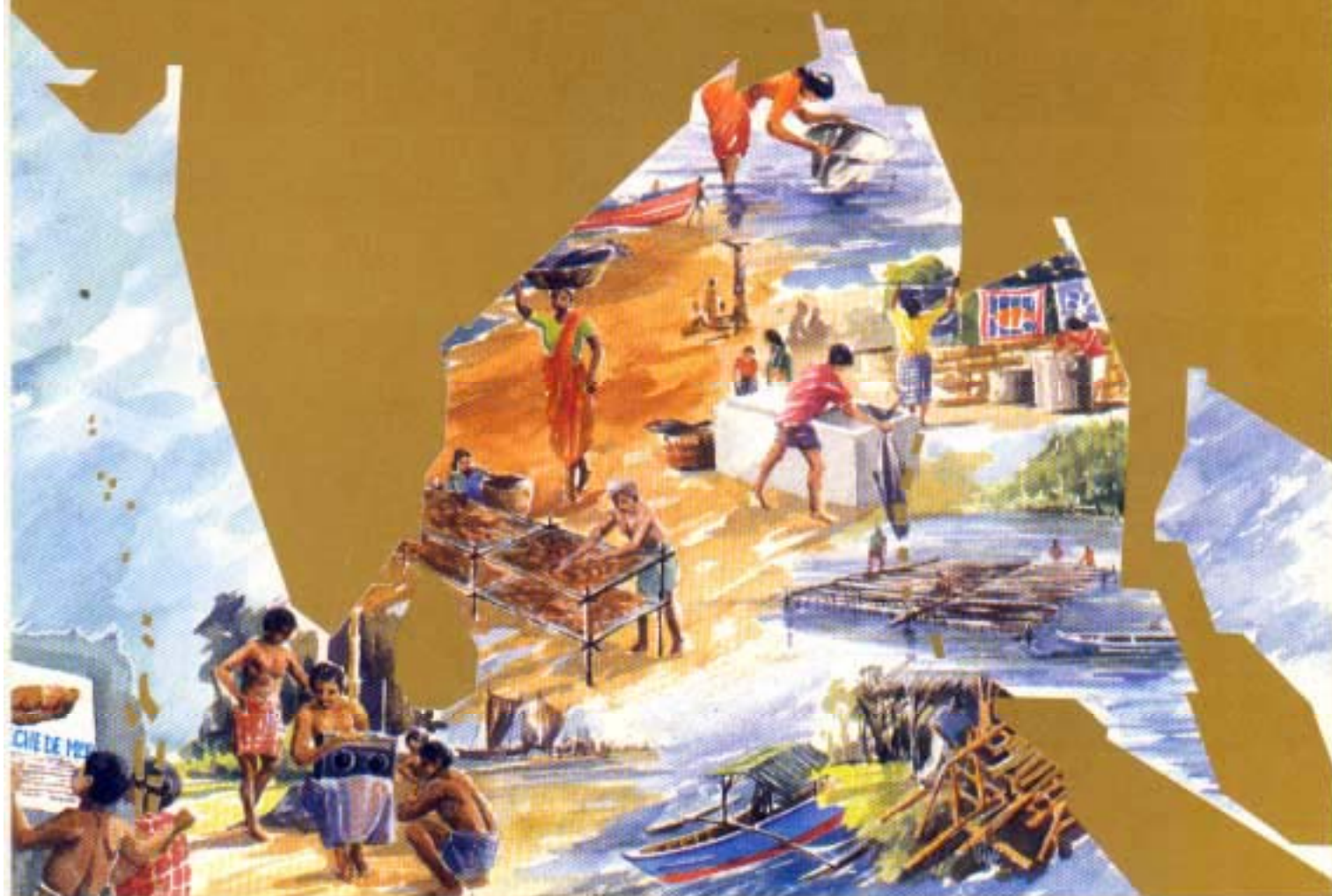


Survey of fish consumption in Madras



BAY OF BENGAL PROGRAMME

Post-Harvest Fisheries

BOBP/WP/83

ODA

**SURVEY OF FISH CONSUMPTION
IN MADRAS**

by

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Fish occupies an important position in the diet of much of the population living in the Bay of Bengal region. It is the most favoured and least expensive form of animal protein available. But poor post-harvest techniques can cause substantial material and nutritional losses of fish. Most commonly, bad handling of fish upon capture leads to rapid spoilage and inevitable downgradation in value. Subsequent poor, or inadequate, processing, marketing and distribution practices tend, in turn, to lead to low-quality products with low market values.

It was against this backdrop that the ODA-funded Post-Harvest Fisheries Project of the Bay of Bengal Programme (BOBP) sought to examine the consumption of marine produce and the extent of current wastage. More specifically, it sought to assess what determined the demand for marine produce — rational considerations or attitudinal aspects or both. It was decided to confine such a study to Madras, the capital of the state of Tamil Nadu, India, in the first instance, but felt it could later be extended to other cities. The underlying reason for studying the market in Madras was that the demand for fish in this metropolis was felt to be considerably low *vis-a-vis* the availability.

To this end, MARG, a leading marketing and research group, was engaged to conduct exploratory research in Madras and study the consumption and attitudes to consumption of marine produce in households in the city. This document not only comprises a report of the findings by MARG during its study, but it also presents a Foreword indicating possible future interventions in the clearly important area of fish marketing. Both the study and the working paper on its findings were funded by the Overseas Development Administration of the United Kingdom.

The Bay of Bengal Programme (BOBP) is a multi-agency regional fisheries programme which covers seven countries around the Bay of Bengal — Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka and Thailand. The Programme plays a catalytic and consultative role: it develops, demonstrates and promotes new techniques, technologies or ideas to help improve the conditions of small-scale fisherfolk communities in member countries. The BOBP is sponsored by the governments of Denmark, Sweden and the United Kingdom, by member-governments in the Bay of Bengal region, and also by AGFUND (Arab Gulf Fund for United Nations Development Organizations) and UNDP (United Nations Development Programme). The main executing agency is the FAO (Food and Agriculture Organization of the United Nations).

This document is a working paper and has not been cleared by the Governments concerned or the FAO.

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FOREWORD

by Tim Bostock'

The consumer is arguably the main determinant of the quality, quantity and diversity of fish supplied to his particular market: because the Bengalis favour freshwater fish, their markets are full of it; as the Tamils have a penchant for Bream, their markets supply them with it, and so on, in reflection of the wide variation in consumer needs. Just how immutable are these needs? Can they be changed to the benefit of both producer and consumer alike?

Indian consumers may well be conservative by nature in their fish eating habits, but it is clear that certain influences can be brought to bear on their traditional consumption patterns. Changes may arise either as a result of internal factors, such as varying income levels and social status, or due to external factors, such as a reduction in the supply of traditional varieties to markets. The latter, often attributable to the absence of controls on fish extraction, may lead to price increases to which the consumer may respond by selecting other species which she perceives as satisfying similar needs.

Whereas these influences may lead to vague and uncontrolled drifts in consumption patterns, others, such as active market promotion, can play a significant role in actually inducing change. The extent to which this can be achieved should be of great interest to development planners, policy makers and the trade in general, because significant social, political and economic benefits could accrue to those who achieve success. The potential outcomes of controlled drifts in both production and marketing sectors is also of particular interest to fisheries strategists wishing to identify ways of improving fish supplies in more sustainable and cost-effective ways.

Why should we wish to induce changes at this time? The overriding consideration is that, with an ever-increasing population, the demand for fish is rapidly growing. Productivity is, however, relentlessly declining, particularly in the inshore waters, due to both a stark absence of coastal fisheries management and considerable post-harvest loss. This scenario raises several questions:

- To what extent is current demand already being satisfied?
- What prospects are there of satisfying an increasing demand, either from existing production, through more efficient marketing, or from new areas or new species?
- Who is actually eating fish now and how important is it in their diet and who will be eating fish in the future?
- To what extent are consumer attitudes towards fish consumption currently determined by parameters such as quality, price, availability or hygiene at point of sale?
- What kind of promotion and key influences could be brought to bear on consumers which may assist productivity, reduce competition for the most popular species and help to decrease the pressure on the inshore fishery?

As a first step towards answering some of these questions, the Bay of Bengal Programme (BOBP), through its ODA-funded Post-Harvest Project, undertook, in coordination with the Marketing and Research Group (MARG), a piece of exploratory consumer market research in Madras, Tamil Nadu, India. The results of this research are presented and examined in detail in this publication.

The research has shown that fish is very highly regarded by the vast majority of the Madras population and across all income groups. It is a very important source of protein, especially amongst the poorer sections. Even so, overall consumption is low. Besides corresponding to the

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All fish names used in the report are the 'English' names popularly used in Madras. See Appendix I, for Scientific, Tamil and general English names.

typical dietary habits of South India, where consumption of animal protein is low anyway, the reasons which may further limit consumption include: poor hygiene and sanitation at the market outlet, the variability in freshness of the fish which is sometimes subjected to poor post-harvest handling, the limited acceptance of a wider range of species and products in spite of a good knowledge of those available. That there is an underlying trend towards greater meat and fish consumption is of great significance. With population growth, this will place an even heavier burden on the fishery and fish trade, which are already groaning under the effort and suffering through lack of investment.

Can the findings of the research help us address the problem of how to augment supplies of fish to an ever-growing population in the face of dwindling coastal stocks? Some potential solutions suggested by the study may be:

- To address the existing marketing constraints both through the development of improved wholesale and retail facilities and through provision of advice and support in fish handling to those involved in fish trading, especially at the small-scale level. This would help increase the throughput and efficiency of the marketing operation, reduce loss, optimize incomes for the producers and simply make the most of what is already there. Great care would need to be taken to ensure that any improvements were cost-effective to the beneficiary while, at the same time, maintaining the affordability of the product. This is especially important with the lower income groups.
- To take a closer look at new or non-traditional varieties of fish which are currently in low demand, wasted or under-exploited. Perhaps in the not too distant future, and with a strong promotional effort, Skipjack, Tuna or Bonito could become as important in the diet of the Tamils as they are in Sri Lanka and as they are becoming in Kerala. It is not unreasonable to assume that if some of the fishing effort currently concentrated on the few traditionally accepted species is diverted toward others, this would indirectly have a positive effect in improving the management of the former. This effect may further be emphasized by the use of more selective fishing gear and corresponding reduction in by-catch.
- To assess the potential of fresh and brackishwater aquaculture to provide greater quantities of fish for local markets.
- To promote awareness of the positive health aspects of fish consumption amongst the poorest socio-economic groups and dispel some of the myths and taboos about fish consumption.

The question arises as to who should implement these improvements and promotional strategies based on ongoing market research. Chicken, eggs, milk and several other protein food not only have more centralized and organized production and distribution systems, but also have their own promotional organizations — such as the Egg Produce Association of India, the Poultry Producers' Association, the Milk Marketing Board etc. However, no such centralized body exists to support the domestic fish marketing sector, which comprises a large number of unorganized small-scale operators.

Such a body could indeed play a major future role in improving fish marketing in India, just as similar organizations have already done so, and are now doing, in other countries. Its strategy, however, would need to be highly sensitive to the diverse consumer needs. For example, considering the crucial role that low value fish plays in the diet of the poor, some of the technical interventions aimed at quality improvement, which are commonplace in other countries, simply may not be financially viable options in India.

Further market research aimed at assessing consumer and trade needs and evaluating potential responses can certainly play a crucial role in the development and eventual implementation of such strategies.

**THE SURVEY
IN BRIEF**

I. OBJECTIVES

The Bay of Bengal Programme, through its ODA-funded Post-Harvest Fisheries Project, undertook in 1991, in coordination with the Marketing and Research Group (MARG), Madras, India, a piece of exploratory consumer market research, the major objectives of which were:

- to investigate the consumer's attitudes to fish in terms of **the critical** needs met by fish *vis-a-vis* other types of food, the factors motivating and deterring the consumption of fish, and the consumer's perceptions of fish;
- **to examine current purchase and** usage habits, more specifically in relation to the selection of fish, the assessment of its quality, the outlets where it is bought, the types of fish **available and preparation** practices; and
- to identify need-gaps or perceived problems, if any, in relation to awareness, availability, freshness, quality, packaging and processing.

Given useful results, similar studies could be commissioned in other consumer centres in the BOB region, from which marketing strategies to meet consumer demand could be evolved and, simultaneously, help could be offered for the development and management of fisheries.

The research was carried out in two distinct but contiguous phases: first, a quantitative study based on a questionnaire given to 2,527 Madras households which was used to gather primary data on the following:

- consumption of high protein foods;
- consumption of fish/fish products; and
- purchasing patterns of fish/fish products.

Second, a qualitative, focus-group research study.

The data gathered were classified by several factors, but primarily by monthly household income.

II. METHODS

Quantitative study

GEOGRAPHICAL COVERAGE

The study covered only the Madras Urban Agglomeration, Tamil Nadu, India.

TARGET RESPONDENT

The target respondents for the study were essentially in two categories:

- Housewife in ALL households;
- In a household where fish was not consumed, or if it was a vegetarian household, an additional member of the household, randomly selected from the over-15s.

SAMPLE SIZE AND SELECTION

A total of 2,500 interviews were proposed across the entire city and across all categories of respondents. Against this, a total of 2,527 interviews were achieved.

A total of 322 starting points were selected in Madras, of which 226 were in the urban area and 96 in the urban agglomeration. Around each starting point about seven or eight contacts were made using the Right Hand Rule, that is, by using the random walk method which eliminates interviewer bias in selection of a household.

In non-vegetarian households where fish/fish products were not consumed in the household and in vegetarian households, all members of the household were listed in ascending order of age and a respondent, apart from the housewife, selected using the Random Selection Grid, thus ensuring elimination of interviewer bias in respondent selection. The selected respondent was then interviewed to determine the incidence of individual consumption of fish, if any, in such households.

QUESTIONNAIRE

The questionnaire (available on request from BOBP/ODA, Madras) was finalized in consultation with the Post-Harvest Project of the Bay of Bengal Programme after an initial pilot study. The questionnaire was mainly structured and took about 15-20 minutes to go through.

FIELDWORK

All interviews were conducted by interviewers from MARG's General Field Force, under the overall control and supervision of MARG's South Zone Field Controller. All interviewers were briefed by a MARG Research Executive.

ANALYSIS

All analysis of consumption of fish has essentially been done by income, location and category of household.

Throughout the report an attempt has been made to include only data which clearly demonstrates statistically significant trends and differences. However, in order to avoid confusion, significance levels have not been indicated. This information may be obtained from the Post Harvest Fisheries Project in the Bay of Bengal Programme.

All data have been weighted by income and projected to the total households in Madras U.A., namely 1,027,000. This has essentially been done on the basis of National Readership Survey-IV, Distribution of Households by Income (NRS-IV is based on the 1991 Census), which is as follows:

	<i>No. of households ('000s)</i>
Below Rs.500	280
Rs.501-Rs.1,000	279
Rs.1,001-Rs.2,000	239
Rs.2,001-Rs.4,000	165
Rs.4,001 and above	64
Total	1,027

Qualitative Analysis

GROUP SELECTION

Ten group discussions were conducted in Madras. The group composition is given below

<i>Category</i>	<i>Age group (yrs)</i>	<i>Monthly household income (IRs)*</i>	<i>Consumption</i>
Housewives	25-40	Below 500	Light+medium consumers
Housewives	25-40	Below 500	Medium+heavy consumers
Housewives	25-40	501-1000	Light+medium consumers
Housewives	25-40	501-1000	Medium+heavy consumers
Housewives	25-40	1001-2000	Light+medium consumers
Housewives	25-40	1001-2000	Medium+heavy consumers
Housewives	25-40	2001-4000	Light+medium consumers
Main Earners	25-40	2001-4000	Medium+heavy consumers
Housewives	25-40	4000-plus	Medium+heavy consumers
Main Earners	25-40	4000-plus	Light+medium consumers

The definition of 'light consumers' was those consuming less than 1 kg of fish in a month; 'medium' those consuming 1-2 kg in a month; and 'heavy' those consuming more than 2 kg in a month,

All consumers were selected from the Madras Urban Agglomeration.

Respondents were recruited by means of a carefully designed recruitment questionnaire and those eligible were invited for the group discussions. All group discussions were conducted by the MARG executive handling the research project and were tape-recorded.

STIMULI USED

On the basis of certain hypotheses made prior to the research, a few stimuli were used. These hypotheses were

- Consumers are indifferent to freshness, quality and hygiene standards in the purchase of fish; and
- Fish is the only non-vegetarian food that has been given little marketing support, in the real sense of the term.

Samples of good quality dried fish, and samples of iced Seer and Pomfret in varying degrees of freshness, were, therefore, used as stimuli. In addition, photographs of different types of fish outlets were also shown to a few groups. Further, in order to elicit reactions to the concept of packaged fish, a few packs of fish from the U.K. were shown to middle and upper income consumers.

- US \$ 1 = 1 Rs 27 appx. (latter half of 1991)

III. MANAGEMENT SUMMARY

General conclusions

The research clearly indicates that fish is a highly appreciated food in all income groups due to its easy availability, affordable price, taste and nutritive value. Consumers with low and middle incomes perceive fish as one of the cheapest forms of adding value to their food intake, It is perceived as the only non-vegetarian food which combines taste, nutrition and easy digestibility as well as affordability. There is high awareness of the various types of fish as well as of their distinctive tastes and values.

Analysis and interpretation of consumer perceptions also reveal that there is immense scope for improvement in certain areas in making fish available.

The study concludes that there are few barriers to the consumption of fish. This is indicated by the somewhat surprising fact that the incidence of consumption of fish/fish products is as high as 91 per cent in the households surveyed. Only 2 per cent of the households consume other non-vegetarian food and no fish, while 7 per cent of the households are vegetarian.

The incidence of consumption of fish/fish products is almost universal in the lower income groups and decreases with increasing income (see Figure 1). This is accounted for by the increasing proportion of vegetarians with increasing income. Significant, however, is the higher incidence of fish consumption in households with housewives in the lower age group. This, combined with the fact that 23 per cent of Brahmin households consume fish/fish products, could suggest an increasing tendency to consume fish/fish products in the future in households not doing so at present.

Fish vs other animal protein foods

Amongst the protein items studied — milk, eggs, chicken, mutton, fish/fish products and other meats — eggs and fish/fish products have the highest incidence of consumption (91 per cent), followed by mutton (81 per cent) and milk (76 per cent). Chicken is consumed by 66 per cent of the population. Not surprisingly, eggs, with a low per unit cost and easy availability, are a high consumption item in all income groups. Milk, on the other hand, which involves a fixed, one-time down-payment for regular supply, has a near universal consumption in the upper income groups, but very low consumption in the lower income groups.

These findings indicate that a major role is played by price in the consumption of food items. In the light of this, it would be pertinent to note that households with monthly incomes upto Rs.2,000/month spend, on an average, over three-fourths of their income on food items. Though this proportion comes down with increasing income, it is, on an average, as high as 40 per cent even in 'households with monthly household incomes of over Rs.4,000.

Expenditure and consumption

Though the consumption of fish and eggs is the highest, the average monthly expenditure across all households is the highest on milk (Rs.92), followed fish (Rs.68), mutton (Rs.55), chicken (Rs.36) and eggs (Rs.27) — again emphasizing the low unit cost of eggs.

In households consuming fish/fish products, the amount spent per month on fish/fish products varies by income — Rs.43 in the below Rs.500 income to Rs.144 in the Rs.4,000 and above income group. The variation in quantity is not much — from about 3 kg in the former groups to about 5 kg in the latter. This would suggest that more expensive products are consumed in the upper income group and less expensive products in the lower income group. This also indicates the availability of a variety of fish/fish products to suit individual household budgets.

The annual *per capita* consumption of fish for all groups is more than three times that of mutton or chicken — 7.2 kg vs 2.4 kg. However, despite an almost universal incidence of fish consumption

in the below Rs.500 and Rs.501-1,000 income groups, 56 per cent and 52 per cent of households respectively consume less than 2 kg/month (equivalent to about 4.8 kg/capita/year), indicating scope for increasing consumption in this category. The average annual per capita consumption of fish for these groups would be about 7 kg. It should, however, be remembered that all estimations are, at best, approximations, as fish is, by and large, sold in heaps and not by weight.

An overall summary of the total expenditure and consumption of fish/fish products across all households is given in Figure 1.

**Fig 1. Indicative consumption of, and expenditure on, fish and fish products
in 1,027,000 households in Madras**

Attributes

Fish/fish products are generally perceived to be better for health, to give more value for money, to be more tasty, easier to cook and more easily available than mutton or chicken. The only factor on which it scores below the other two is on ease of cleaning and this could well reduce the quantity of fish consumed.

Major reasons for eating fish/fish products are essentially taste and economy, with economy obviously playing a major role only in the lower income group. Nutrition and health are more emphasized in the upper income group.

Fish product type

Amongst fish/fish products available, seawater fish is consumed universally. This is followed by the consumption of dried fish (83 per cent), shrimp (68 per cent) and crab (60 per cent). The consumption of shrimp is higher in the upper income groups and that of dried fish in the lower income groups, while that of crab is spread across all income groups. Crab is obviously a delicacy available at reasonable prices, but it may not be available at all times or easily prepared, which is perhaps why only a 60 per cent consumption is recorded.

Freshwater fish

The incidence of consumption of freshwater fish is only 20 per cent. However, the popularity of 'Golden Fish' (a farmed Tilapia) amongst consumers would suggest there is a major role for marketing in promoting a specific variety of fish.

A lot of consumers appear not to be very familiar with the taste and nutritive value of freshwater fish; this is, perhaps, due to locational constraints. However, with marketing and advertising support as well as branding of freshwater fish, under the 'Golden Fish' banner, many consumers, even in the low income groups, have been induced to try it. It is not only felt that it added variety in consumption but also offered status benefits that fish, as a category, lamentably lacks. Consumer willingness to experiment indicates that promotion of freshwater cultured fish has a lot of scope.

The greatest benefit associated with this category is that freshness is assured and that there is no fear of compromising on freshness as in marine fish.

Dried fish

Despite the fact that dried fish is liked by all consumers, both in terms of taste as well as convenience, there is a certain degree of embarrassment in admitting it. This is partly because of the poor status value associated with its consumption and partly because of practical difficulties, viz, the strong and unpleasant smell, excessive salt content, poor quality etc. Therefore there is a need to make available good quality dried fish, either loose or in functional packaging. Status value could be enhanced by popularising the expensive varieties of dried fish, viz. Seer and Seaperch.

Improvement in quality should also take care of current perceptions relating to the ill-effects that dried fish have on the consumer's health. Education pertaining to the handling and preparation of dried fish would enhance the consumer's interest in the product.

Awareness and preferences for seawater fish

Awareness of the varieties of seawater fish is very high. However, purchase and consumption is restricted to specific species in specific income groups. Bream is the only variety whose consumption is common across all income groups.

The varieties consumed in the lower income group are: Whitefish, Anchovy, Mackerel, Sardine and Goatfish. The varieties consumed in the upper income group are Seer, Pomfret, Shark and Seaperch. Whitefish and Anchovy are also consumed to some extent in the upper income groups.

Awareness is over 50 per cent for at least 17 varieties of fish. Catfish, Ribbonfish, Horse mackerel (Catangids), Indian salmon (Polynemids) and Sole/Flatfish are varieties with over 50 per cent awareness, but are little purchased (14-29 per cent).

Ray, Eel, Jewfish (Sciaenids) and Tuna have an awareness ranging from 27 to 45 per cent, but purchase is only 4-7 per cent, indicating a very specific preference for certain varieties.

The most preferred fish are the Bream and Seer. Again, the major reason for preferring any specific variety is taste. This is followed by economy in the lower income group and fewer bones in the upper income group.

Less popular species

Though consumers are aware of a wide range of species, they state that they prefer to confine themselves to familiar and popular species. Therefore, they feel, if there is some dependable and authoritative source from which they could learn about the characteristics of the other species, a much wider variety would then become available to them.

Status

Another interesting factor is that of the status associated with fish consumption; it is very low compared with other protein foods. Amongst the fish species, some (such as Seer) are, as expected, more status enhancing than others. The extent to which the status image of fish in general could be enhanced through promotion of its health aspects is likely to be considerable. For example, Shark, a variety which appears to have gained popularity over the last few years, is associated with good taste, lack of bones, availability, high nutritional benefit as well as several anecdotal medical benefits. Promotion of Shark and other under-exploited resources, such as Tuna, could lead to additional supplies of high quality fish to the growing markets.

Frequency of purchase

The varieties preferred are bought at least once or twice a month. On each occasion, the average quantity bought is 250-500 g. Based on the quantities consumed, it could be said that the two most popular varieties, Bream and Seer, together account for at least 20 per cent of the fish/fish products consumed in Madras.

Form of preparation

The curry and the fried form are the preferred preparations. The curry is more popular in the lower income group, suggesting a substitution of *dal* (lentils) and vegetables with fish. The fried form is preferred more in the upper income groups. The shark is the only fish which is usually steamed and tempered.

Overall, the research reveals, consumers lay more emphasis on enhancing and ensuring taste while preparing fish dishes. There is no felt need to retain the nutritive value of fish during cooking or after. Also, consumers are not sure about the supplementary foods that need to be cooked while preparing fish. Further, fish recipes are felt to be fewer compared to other non-vegetarian foods. Hence, tips offered by an agency to add variety, improve taste and retain nutritive value would be welcome.

Fish products and packing

The research indicates quite clearly that the market is not yet ready to accept processed or packaged food in its strictest sense. However, fish fillets, and fish products which are nearer-to-basic in form and yet offer convenience and quality, could be offered on an experimental basis. Fish pickles, fish chips, dried fish and dehydrated fish have potential if marketed by a company of repute. Frozen fish is another product that attracts the interest of upper income consumers. These consumers are also willing to pay a premium for accessibility, hygienic packaging and cleaning, all of which stand in the way of more frequent consumption. Branding could also enhance status value, and the promotion of the 'tasty' and 'nutritious' image of the product would help stimulate interest by this group.

Purchasing decision

The decision on the variety of fish to be purchased and the actual purchase are both done by the housewife. However, the incidence of purchase by housewives drops with increasing income and is only about 50 per cent in households with incomes over Rs. 4,000. Correspondingly, purchase of fish by the chief wage earner is more prevalent in the upper income group (20-24 per cent).

The role of others, possibly domestic help, also increases with increasing income. This phenomenon is possibly what leads the upper income groups to pre-decide on the variety before purchase, unlike in the other income groups where the variety is decided on after seeing availability and freshness. In about half to two-thirds of the pre-decided cases, the variety decided on was not available and half of those who did not find the variety returned without purchasing any alternative variety. This would, therefore, suggest a need for marketing of fish/fish products in places accessible to the housewife in these income groups.

Point of purchase

Fish is at present purchased from vendors who bring it home in the case of 20 per cent of the households consuming fish. This proportion is higher in the lower income group, indicating a regular demand for the product from this class. Almost all the others buy their fish in their own locality — within a radius of less than one km. Only a discriminating 4 per cent in the lower income group and 8 per cent in the upper income groups go to places beyond 2 km — possibly to special markets for fish/fish products.

Consumers are generally not very happy with the government fisheries stalls. The need to have a wider variety, especially of the inexpensive species, greater accessibility, better locations, more affordable prices and more helpful and friendly assistants at the government fisheries stalls are highlighted by consumers. In addition, there should be advertising efforts to motivate consumers to visit these stalls more often.

Freshness at retail

Consumers unequivocally hold that freshness is extremely important and is the overriding factor in influencing purchase. The consumers' understanding of what constitutes freshness was, surprisingly, similar across all income groups.

As distinct from 'freshness', all consumers agree that 'fresh fish' is that which has not been kept on ice and, as such, is almost never available. The use of ice to keep fish fresh prior to sale appears to be commonly understood and this fact tends to dispel the myth that many retailers have about the negative association that the consumer has with fish sold on ice. Clearly the retailer is making an attempt to sell his fish on a 'fresh' ticket, assuming that the consumer is being duped! Several mentions of retail malpractices aimed at false enhancement of 'fresh' appearance were mentioned. These include use of red dye on the gills; addition of beach sand; mixing bad fish with good; and even stuffing fish to enhance weight. This kind of consumer/trader mistrust may not be widespread, but could nevertheless be removed to some extent by promoting improved handling through a more extensive use of ice in fish marketing.

Hygiene at outlets

The research indicates that despite the insensitivity of the majority of consumers to the poor hygiene conditions at outlets, this is an area that needs greater attention. As the fish will be 'cleaned' at home, it would appear that lower income consumer groups are prepared to put up with dirty markets in order, they believe, to keep prices competitive. This attitude is quite understandable, given the low levels of income of most of the respondents. However, the inherent public health hazard represents a significant, yet unquantifiable, threat to the population. The middle and high income market segments do indeed recognize this problem as critical and tend to avoid dirty

markets or, at least, if able, send servants to make the purchases. Health risks, such as diarrhoea, associated with consuming fish, are recognized as important factors inhibiting fish consumption and tend to work against the already well-established health advantages. It is clear that cleaner market facilities may attract more customers as long as prices remain unaffected. Middle/upper income groups would even pay a premium for better shopping comfort. Moreover, education about the ill-effects of poor hygiene at outlets would convince consumers about this need.

IV. CONCLUSIONS

There appear to be few barriers to consumption of fish/fish products in households. On the contrary, there is tremendous potential to increase the quantity of consumption of fish in all households. There would also appear to be an increasing tendency within the population towards fish consumption.

In the lower income groups, just over 50 per cent consume less than 5 kg/capita/year only and consumption could be increased, probably by emphasizing to this income group the nutritional and health benefits of fish consumption in general.

in the upper income groups, the consumption of fish with **fewer bones**, *i.e.* the varieties preferred by them, could be increased through simple product development focussing on improved convenience, *e.g.* pre-cleaning, enhanced quality and packaging, and by better marketing and distribution. However, the taste factor should always be maintained.



Fish on ice in a local market

**DETAILED
COMMENTARY**