NUTRITIONAL STATUS OF WOMEN ENGAGED IN FISHVENDING IN TRIVANDRUM DISTRICT

BY

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DECLARATION

I hereby declare that this thesis entitled "Nutritional Status of women engaged in fishvending in Trivandrum district" is a bonafide record of research work done by me during the course of research and that the thesis has not previously formed the basis for the associateship, fellowship or other similar title of any other university or society.

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CERTIFICATE

Certified that this thesis entitled "Nutritional status of women engaged in fishvending in Trivandrum district" is a record of research work done independently by Miss. Karuna M.S. Under my guidance and supervision and that it has not previously formed the basis for the award of any degree, fellowship or associateship to her.

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INTRODUCTION

INTRODUCTION

Kerala is a narrow strip of land situated at the south-east line, having 590 kilometers. The fishermen population of the state are scattered through out the coast-line of Kerala. This community forms 3.00 per cent of the total population of the state and is considered as an underprivileged section of the society (Government of Kerala, 1990). Because of social backwardness compounded by poor living conditions of this community, specific health and social problems are found to be the characteristic features of this population.

Women and children in Indian society are considered as vulnerable segments of the population due to their deplorable living conditions. Peculiar environmental situations prevalent in the coastal areas further negatively influence the nutritional status of women of the fishermen community.

According to Kharbanda (1991), 94.00 per cent of the women workers of the third world and 89.00 per cent of the Indian women workers belong to the informal sector. They are reported to live and work in sub-human conditions of incomplete human existence, sustaining their households on a meagre income of discriminatory wages and carrying the double load of drudgery at home and outside the home. However in Kerala, employment outside home by the women was found to benefit the working women and their families, since the income generated could increase the

purchasing power and standard of living with consequent improvement of their nutritional status (Prema, 1986). However in a report published by N I N (1985), it has been stated that dual stress and conflicting demands of the women in and outside home have been shown to have adverse effects on their health status. Unlike their counter parts in other groups of the society, women of fishermen community have their own physical drudgeries in functioning as wage earners and fulfilling their role as housewives.

Studies on the role of female labour in the fish marketing are few. The statistics now available are highly inadequate and unreliable. A systematic and comprehensive investigation on the conditions of the women in this complex occupation is necessary. Hence, the present study on the "Nutritional status of women engaged in fishvending in Trivandrum district" was undertaken.

1. To assess the socio-economic status of the fishermen families.
2. To assess their food consumption pattern.
3. To study the time utilization pattern of the women engaged in fishvending.
4. To determine the actual energy expended by the women for various fields and domestic operations and
5. To ascertain the influence of the above factors on the nutritional status of the women engaged in fishvending.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

"Fishing and fish marketing" has been ranked as one of the oldest occupations of mankind. Fishermen were always found to be at a very low level of socio-economic development and poor living conditions were noted to directly affect their nutritional status. Fishing and marketing are reported to be the combined effort of the head of the family and his spouse. The fisher women who are engaged in fish marketing play a dual role of a housewife as well as of a wage earner and hence they are subject to great stress and strain. Research and development programmes implemented so far by various agencies, have not succeeded much to solve the socio-economic and nutritional problems of these women in Kerala. Here an attempt is made to present the concepts and earlier studies relating to the socio-economic and nutritional situation of the women belonging to the fishermen community.

2.1 Demographic profile of the fishermen community

Very few studies enlightening the demographic profile of the fishermen community have been conducted in India.

Kurien (1980) has reported that there were about 1800 fishing villages in India, with about one million traditional fishermen who accounted for 65.00 per cent of the total marine fish production. He analyzed the social and economic conditions of these fishermen and reported that most of them were poor.

Veeraputhiran (1988) has estimated the fishermen population of India as 5.38 million representing about 0.80 per cent of the total population. Fishing has provided direct employment to about 1.80 million fishermen, 0.90 million being engaged in fishing and fish seed collection and rest in related activities such as fish curing and marketing.

A detailed study conducted by Narayana kurup *et al.* (1987) revealed that there were about 15,600 fishermen households in Karnataka State, 58.00 per cent of whom were residing in Dhakshin Kannada district and the remaining in Utter Kannada district. The adult population which formed the major component of productive labour in the community accounted for 60.00 per cent of the total population, of which 29.00 per cent were males and 31.00 per cent females. According to Scariah *et al.* (1987) the total fishermen population in Orissa was 1.17 lakhs, out of which adult males constituted 32.00 per cent and female 29.00 per cent.

Vasanthakumar *et al.* (1987) reported that about 4.64 lakhs of fishermen depended on fishing for their livelihood in Tamil Nadu. The fishery employed about 90.00 per cent of fishermen and 20.00 per cent of fisherwomen. About 54.00 per cent of fishermen households owned gears while about 42.00 per cent of the household owned crafts. A study conducted by Dharmaraj *et al.* (1987) revealed that there were 3.96 lakh fishermen along the coast of Tamil Nadu and 25.00 per cent of

this population located at Kanyakumari District. Varghese *et al.* (1987) found that the total fishermen population in West Bengal was 0.84 lakhs, of which adult males constituted 33.00 per cent and females 28.00 per cent. Alagaraja (1987) reported that Lakshadweep consisted of 10,700 fisher folk. Among them 3900 were adult males and 3000 females. According to the census data there were 2.32 lakh fishermen in Maharashtra living in 40,500 households. The active fishermen constituted about 20.40 per cent of the total population (Srinath *et al.*, 1987). Balan *et al.* (1987) observed that the total marine fishermen population was about 1.52 lakhs in Gujarat. Of the total population, adult males and females constituted 28.00 per cent each. There were 23,000 fishermen households in the State.

In West Bengal all fishermen belonged to scheduled castes and 90.00 per cent of this population considered fishing or fishing industry as their hereditary source of income (Government of Kerala, 1990).

Jacob *et al.* (1987) reviewed the total fishermen community in Kerala as about 6.4 lakhs. Adult males and females formed 33.00 per cent each of the total population. The district wise distribution of the total fishermen population ranged from 8 per cent in Ernakulam, to 21 per cent in Trivandrum. There were about 1 lakh fishermen families in the State. Krishna (1988) found that 57.00 per cent of the fishermen families in Cochin were engaged in marine fishing; and the rest engaged in other

activities related to fishing like trading and post harvest operations. John and Thankappan (1988) reported that fishermen communities in Kerala, as in every other part of the country, had been ranging behind the margins of the society geographically, economically, socio - culturally and politically. The women folk of the community were also reported to be involved in fishvending.

A survey conducted by Kerala Agricultural University in Trivandrum, in 1989, revealed that the important fishing communities in Kerala were the Mopilla, Araya, Thiyya, Mukkuva, Karakka and Valan. A study conducted at Trivandrum coastal areas has revealed that the main occupation of Valiyaveli fishermen community remained to be fishing and other related jobs (Anon.,1989).

In a report published by Government of Kerala (1990), the district-wise distribution of marine fishermen households and population of Kerala are reviewed; the details of which are presented in Table.1.

2.2 Salient characteristics of the fishermen households

Prabakaran (1978) defined a fishermen household as one which consisted of a group of persons living together, pooling their income together, and taking the principal meals from a common kitchen, and whose major source of income was from

Table 1 District-wise distribution of marine fishermen households and population of Kerala.

Districts	No.of households	Population		
		Male	Female	Total
Trivandrum	2217	6528	6052	12580
Quilon	1161	4039	3552	7591
Alleppey	1244	4644	4460	9104
Ernakulam	1239	3805	3707	7508
Trichur	716	2806	2494	5300
Malappuram	501	2150	2113	4263
Kozhikode	1382	5611	5268	10879
Cannanore	407	1547	1496	3043
Kasargode	505	1507	1549	3056
Total	9372	32637	30687	63324

Source: Government of Kerala (1990)

fishing. Sathiadas and Venkataraman (1981) defined fishermen household as one wherein atleast one member of the family was engaged either in fishing or in activities related to fishing.

In traditional fishing societies, productive activities were not limited to the harvesting of fish, but also include related activities like fish processing, marketing as well as horticulture and animal husbandry (Pollnac and Richard, 1984).

Blase (1982) found that the families of the fishermen lived in huts of mud or palm leaf walls with thatched roof. In a survey conducted by Government of Kerala (1990) among marine households, 56.18 per cent were found to be living in huts and the rest lived in semi - pucca or pucca houses. Among these households, 94.34 per cent in owned huts or houses and the rest in rented huts or houses.

2.3 Socio-economic factors influencing the quality of life of fishermen community

Earlier studies conducted on the socio-economic factors influencing the quality of life of fishermen community indicated that family size, labour pattern, educational level, indebtedness, liquor addiction, lack of income and lack of infrastructural facilities at work place etc., influenced the life of the fishermen families.

Sreenath *et al.* (1978) observed that due to the increased family size the per capita income decreased, reducing there by the money spent on food, clothing, education and recreation. Kurien (1980) studied the social factors and economic organization of the traditional small scale fishermen of India. There were about 1800 fishing villages in India, with about one million traditional fishermen who accounted for 65.00 per cent of the total marine fish production. He analysed the social and economic conditions of these fishermen, who were politically powerless. He threw light on the defects of the present market

system which exploited the fishermen and perpetuated the conditions of poverty and indebtedness which prevailed among them.

A socio-economic study conducted by Warrier (1980) in Madras city focused attention on the literacy rate, nature and pattern of employment, income level, indebtedness and the expenditure pattern of fishermen households. The study revealed that most of the households had deficit economy. Lack of fishing equipment, migration of shoaling fishes and intensive competition among the fishermen were some of the causes responsible for their low income. The author also noticed, the absence of thrift attitude among the fishermen households.

The study carried out by Kusno (1980) on the socio-economic characteristics of small scale fishing households in the Northern coasts of Java and Malacca strait coast of Sumatra, found that the living conditions of the fishing labour households were lower than those of fishing households on the whole. He also found that income generated by the fishing labourers' households from sources other than fishing was more in Malacca strait than in the north coast of Java. The author finally concluded that the living standards as well as economic levels of small scale fishing households in the coastal areas were lower compared to medium scale fishing households.

Ambrose (1981) reviewed the present conditions of fishermen and made suggestions for their upliftment. The author was of the view that the static labour pattern existing in the fishing field was one of the main causes for the proverbial poverty of the fishermen. An analytical study on the indebtedness of fishermen community showed that around 67.00 per cent of the debts normally incurred by them was for the purchase of nets. (Natapracha and Pietersz, 1984).

Xavier (1984) compared the fishermen population of a rural area with that of an urban area in Tuticorin, Tamil Nadu. It was found that the rate of literacy was slightly more in urban area than in the rural area. The study analysed the employment pattern, annual household expenditure, savings, borrowing and mode of spending of fisherwomen households both in urban and rural areas. Jonge *et al.* (1987) studied the socio-economic conditions of the fishing households in Malaysia. They found that three factors affected the income of these households; viz., type of fishing gear utilized, participation in non-fishing activities and contributions made by other household members.

Charyulu and Narayana (1987) reported that large scale addiction to liquor, poor work motivation and lack of work were the major reasons for not having adequate food and clothing among the fishermen at Sagar, Karnataka. Those who were addicted to liquor forced the women to part with their earnings, thus causing hardship to the women. Leela (1988) conducted a study on

the socio-economic conditions of the fishermen in Narakkal and Kandakadavu. She found that the average income of the fishermen in both the villages ranged from Rs.5000/- to Rs.8000/-per annum. Most of these households had 5 to 10 cents of land and had their own houses.

FAO (1988) observed that fishermen population, like smallscale farmers and landless pastoralists shared common disabilities such as limited assets, environmental vulnerability and lack of access to public services and amenities, with special reference to education and medical facilities.

Sukumar *et al.* (1987) observed that the low educational and income status of fishermen families were attributed to their general poverty and economic backwardness. In Karnataka State, besides formal female dominance, households were headed by the female members when male members were not with the family, or not earning, and in case of widowhood and separation (Giriappa, 1988). It is now widely recognized that the female headed households in rural areas tend to be poor. Some recent evidences from India suggest that when compared to male headed households, female headed households had poorer survival chances and that the women had lack of access to land resources, greater dependency on wage income, higher rate of involuntary unemployment and illiteracy (Anon., 1988 a).

The study conducted by Gnanasekaran (1980) on the socio-economic status of the fishing sector of Porto Novo coast, identified no other source of income barring fishing and also stressed the need for mechanization of crafts and creation of infrastructure facilities for the welfare of the fishermen households. Durairaj (1981) in his study of marine fishing in Thanjavur district revealed that the distribution of income in the worker groups in both mechanized and non-mechanized sectors was more equitable than in the owner - worker groups and that the worker in the mechanized sector could get a higher income than an owner - worker in the Katamaram sector. The author stressed the need to improve the efficiency of Katamaram by suitably modifying the traditional craft. Sathiadas and Venkataraman (1981) studied the impact of mechanized fishing on the socio-economic conditions of the fishermen of Sakthikulangara and Neendakara fishing villages of Kerala. The study revealed that the benefits arising out of the introduction of mechanized fishing were seen more in Sakthikulangara than in Neendakara Village. The authors were of the view that the households in the middle and higher income groups were more benefited by the additional income generated by mechanization in fishing and that the financial position of the lower income groups could not permit them either to purchase boats or to invest huge amounts of money on activities related to fishing.

Datta *et al.* (1988) studied the role of middlemen in marine fish marketing in Orissa. The study revealed that 90.00 per cent of both mechanized and non-mechanized fishing units were compelled to sell their catch extensively to traders to whom they were already indebted. It was observed that there was wide variation between the price of the fish when landed and the price of the fish when finally sold, particularly in the case of the fishes of high quality.

Jacob *et al.* (1987) found that among the fishermen community in Kerala 23.00 per cent were literate. In this 81.00 per cent had completed primary education, 16.00 per cent secondary education and 3.00 per cent had studied beyond secondary education. Narayanakurup *et al.* (1987) compared the educational level of fishermen residing in two districts of Karnataka. He found that 25.00 per cent of the fishermen had received education; of which, 19.00 per cent upto primary level, 5.00 per cent upto secondary level and 1.00 per cent above secondary level.

Dharmaraj *et al.* (1987) compared the literacy level of fishermen from different districts of Tamil Nadu. They found that the highest literacy rate found was in Chengalpattu (30.61 per cent). As per a study conducted by Scariah *et al.* (1987) among the fishermen population in Orissa 7.00 per cent had studied upto primary level, secondary 2.00 per cent and less than 1.00 per cent had gone beyond secondary level.

According to Balan and Sivaraman (1987), 16.00 per cent of the fishermen completed primary standard, 3.00 per cent secondary standard and less than 1.00 per cent above secondary in Gujarat. Varghese *et al.* (1987) found that the fishermen who possessed primary standard of education formed 19.00 per cent, secondary standard formed 6.00 percent and above secondary standard less than 1.00 per cent in West Bengal. Alagaraja (1987) reported that in Lakshadweep and Andaman and Nicobar islands, out of 10,700 fishermen population only 3,686 fishermen population received education from primary to higher levels. In the primary level there were 2,500 persons (68.00 per cent) followed by 760 in secondary level (21.00 per cent) and 430 in above secondary level (11.00 per cent). Vasanthakumar *et al.* (1987) reviewed the important goals of marine fisheries expansion service. The motto of these organizations was to improve the standard of living of fishermen households and optimum utilization of fishery resources for employment production and export. In this review, they had pointed out that despite the increasing attention of the Government to fisheries extension work, majority of the fishermen population were caught in a vicious cycle of poverty and indebtedness. According to Krishna (1988) the educational status of men, women and children in the fishermen community of Cochin was 37.57, 36.00 and 26.50 per cent respectively. In a report on the fishermen community in Kerala, published by Government of Kerala (1990) nearly 63.00 per cent of the males and 59.00 percent of the females were literate. As per the 1991

census, female literacy in Kerala was 86.93 per cent with the highest female literacy (Bharadwaj and Dutta, 1991).

2.4 Family expenditure pattern of the fishermen households

The socio-economic conditions of the fishermen population including income and expenditure, showed that 82.00 per cent of the income was spent on food (Anon., 1979). Ramadasmurthy *et al.* (1983) reported that nearly 84.00 per cent of the family income was spent on food by rural households indicating a similarity with fishermen population. According to Rajammal and Parvathy (1986), the rural households spent over 90.00 per cent of their income on food without including fuel.

Lalitha and Sharada (1988) found that the major source of income of the farm labourers was from agriculture as wages, and the other sources of income included that from dairy. The authors indicated that the expenditure on food exceeded the total income. The difference between income and expenditure was met by borrowing.

A socio-economic survey done in seven fishing villages from five coastal districts of Andhrapradesh revealed information on food expenditure. It was shown that 58.00 to 83.00 per cent of the total income was spent on food and out of this 5.00 to 23.00 per cent was spent on fish alone (Anon.,1978). Aida *et al.* (1979) found that food accounted for over half the total household budget outlay fishing and farming households, with the remaining

outlay going to such items as education, clothing, medical assistance and home improvement. Another socio-economic survey of 22 fishing villages in Andhrapradesh focused on the food expenditure pattern. It revealed that 51.43 per cent of the income was spent on food and liquor, of which 11.60 per cent was on fish (Anon., 1978).

Panayotou (1980) reported that thousands of small scale fishermen had to struggle to hold on to fishing as an occupation and a familiar source of income in Thailand. The author further reported that there was an urgent need for non-fishing activities to raise the small-scale fishermen's opportunities in the coast so that their income might be enhanced.

In a study carried out by Paul (1981) on the economic conditions of fishermen at Poonthura village of Trivandrum district the economic dimensions surveyed were daily expenditure, levels and patterns of employment and indebtedness of fishermen households. The study identified the problems of under employment in the area.

Sathiadas and Venkataraman (1983) studied the indebtedness and utilization of credit facilities in Sakthikulangara and Neendakara villages of Kerala and dealt with the average annual income, extent of indebtedness, role of institutional and non-institutional credit agencies in providing finance and utilization of credit by fishermen of different income groups.

Food was the major item of expenditure in all Maharashtra fishermen villages. Out of the total annual expenditure for mechanized and non-mechanized group, 61.10 and 58.00 per cent of the income were incurred on food respectively (Anon., 1988). A micro-level analysis of food consumption in the context of differential economic opportunities was carried out in Utter Pradesh. The author found that the small holders, medium farmers and the marginal farmers spent about 33.50, 41.00 and 71.00 per cent of their respective total income on food. It was concluded that the financial hierarchy of the village was strongly correlated with land ownership (Varma, 1989).

2.5. Occupational hazards faced by the fishermen community in fishvending

Blase (1982) reported that fish from Adirampattinam, Tamil Nadu was transported by headload, buses, train, small vans and big trucks and as the quantity increased, fish was transported over longer distances. In this area the majority of the fisherwomen took their fish by bus or train to various markets situated and the distance varied from 5 to 60 kilometers from their village, while a minority walked with headload of fish to neighbouring villages half to 8 kilometer away (Natapracha and Pietersz, 1984). John (1984) studied marketing of fish in the Kerala State. He observed that in Trivandrum district due to the higher involvement of women who walked to the markets, over half the fish moved less than 20 kilometers from the coast. He

further reported that 69.00 per cent of the fish was handled by the women fish-vendors after buying the fish from the sea shore or wholesale market. They carried it on their heads and sold it either locally or in adjacent markets (80.00 per cent).

Natapracha (1986) found that they had to take ferry, bus and rickshaw to cover the distance of 20 kilometers and await boats that arrived at odd hours-2.00 pm and 2.00 am. Drews (1985) reported that fishing related activities and small scale fishvending were done by fisherwomen and in some areas men were found to have too limited scope for any viable technical improvement. About 60.00 per cent of the fishermen families in Juldia - Shamipur, inclusive of men and women were engaged in selling fish, for which they borrowed money at high rates of interest from private money -lenders (Anon.,1986). According to Natapracha (1986), in Bangladesh, fish marketing was a strenuous work. It meant long waits at the shore for fishing boats to arrive, tough bargains to buy fish, carrying headloads of fish for sale either to the local market or from door to door in towns nearby.

In a report published by Government of Kerala (1990) it was reported that in addition to fishing, a good number of persons in the fishing community were engaged in marketing of fish. They were mostly the persons who carried the days catch by headload to the nearby households or markets for selling directly to consumers. The fish was generally auctioned by traditional

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auctioners or middlemen on commission basis, who also took the responsibility for realising the sale which proceeded from the traders. The middle men were often money - lenders, advancing funds to fishermen and thereby exercising perpetual control over the fishermen's economy.

2.6 Women workers in the informal sector

An examination of studies on the informal sector revealed gaps in the studies on women workers. A report by the Indian Social Science Research on the status of women, as quoted by Nandini (1986) revealed that the statistics relating to women workers in the unorganized sector and services became highly inadequate and unreliable in the absence of any systematic and comprehensive study of the conditions of women in this complex group of occupations, self employed wage earners and entrepreneurs.

Jaya (1978) found that most of the poor women working in informal sector in Madras were self employed and practising in some petty trade sector selling vegetables, fruits, fish and snacks to support their families. Elizabeth (1978) studied the tasks of employed women in the informal sectors of Bangladesh. According to Elizabeth, women were playing dual role as housewives, rising very early in the morning to prepare meals for their husbands and children and as wage earners. Since the women participated in both home and market production, they

worked longer hours and had less leisure time than men. There was a dramatic increase globally in the participation of women in economic activities as wage earners (Anon., 1980). UNICEF (1982) reported that most of the task connected with growing food, and all the tasks connected with preparing it were done by women.

However, women were reported to occupy inferior status within their own societies; earn less income, have less access to education and training, enjoy fewer legal and property rights, and were mostly excluded from participation in decisions which affected their lives (Anon., 1980a). Patel (1982) observed that women were with family responsibilities. Their low wages and their low skills were the natural consequences of their biological conditions.

CWDS (1983) reported that the main drawbacks in women's development in India were mainly pre-occupied with repeated pregnancies without respite in physical work load, lack of education-formal and non formal, and preponderance of social prejudices along with lack of independent income generating or economic activities or independent assets.

Kumud (1985) suggested that of all the hours work throughout the world, women contributed about two thirds. She had further reported that the rural women grew atleast 50 percent of world's food, produced most of the food for domestic consumption and processed, prepared and served to families. In addition, in some developing regions, a quarter to half of rural

households were reported to be permanently or defacto headed by women. UNICEF (1985) found that women performed tasks essential to any society's survival from raising children to growing and from earning food to feeding their families.

A study conducted by NIN (1985) revealed that in rural areas women came from less educated and economically poorer segments of the Village community, working as unskilled labourers in the farms. They further reported that dual stress and conflicting demands of work in and and outside the home showed adverse effects on maternal and child health and nutritional status. Dhillion (1986) found that heavy schedule of work of rural women led to complete physical exhaustion and reduced working efficiency.

According to Prema (1986) employed women from economically poorer segments of population in the village with lower purchasing power and lower dietary intake had deficient nutritional status.

Among the many factors influencing the status of women, the socio-economic status, family status and employment status were very important. According to Charyulu and Narayana (1987) as long as women did not possess productive assets, they were deprived of economic status.

Rural women by and large were isolated with limited opportunities of group activities and associations (Anon., 1987).

Rao (1987) found that the stress of the new life style forced women to show clearly their roles and change their maternal behaviour which resulted in the negligence of their own health and led to the various nutritional problems, as they resumed their income generating economic activities immediately after a short period.

Marothia and Sharma (1986) studied the female labour participation in rice farming system of Chattisgarh region. They found that the rate of female labour participation was higher than that of male labourer on all farm size groups. Saradamoni (1987) studied the women's involvement in labour and rice production in Kerala, Tamil Nadu and West Bengal and found that their contribution was neither marginal nor insignificant. Through their work, knowledge and skill, both categories of women made crucial contributions to the production and processing of rice as well as to household expenditure. Singh *et al.* (1988) studied the participation of rural women in agriculture in the hills of Utter Pradesh. They were employed in different activities in crop and livestock enterprises such as sowing, paddy transplanting, threshing and winnowing, grass cutting, feeding and milking of animals. Longe (1988) reviewed the role of women in food production in Nigeria. More than 45.00 per cent of the rural population engaged in the production of both crops and live stock were women. Women dominated the farming business and were able to provide enough food for their families and for sale,

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thereby gaining income for the family. Axinn (1988) reported that women had been providing skill and labour for agricultural production, as well as subsistence of food, water and fire wood for their families. Leslie *et al.* (1988) reported that women must manage the family household and supplement the family's income through farm or non farm production, they must also fill a central role as promoters of family health. Women would have to work more hours to compensate for lower wages, adjust to larger fees at health clinics, and make with smaller amounts of less nutritious foods. Further more, the effects of economic crisis and adjustment on poor families may be perpetuated from one generation to the next, as daughters might be held out of school to take care of younger children so that mothers could work more to maintain the family income.

Sadik (1988) found that the women's contribution to social life provided the essential underpinning of social development. He further showed how women were the principal suppliers of water, fuel, food and milk. Cultivation and live stock management were important human activities in the development of subsistence, in the rural environment.

The study conducted by Khan and Bella (1989) showed that the plight of women, even when their financial contribution to the family was substantial, was not reduced. Their working hours were longer causing extra metabolic strain. The clinical, anthropometric and dietary data showed that most of the women

were malnourished and their caloric intake along with other nutrients was less than Recommended Daily Allowance. On all these accounts working women were worse than the housewives.

Sundari (1989) reported the position of women in Indian society which was characterized by a declining sex ratio, higher mortality than males from infancy through 35 years of age, high fertility, poor health status, illiteracy, low participation in the organized work force, increasing concentration on unorganized sector, absence of social support measures and increasing social and domestic violence. Ramankutty (1989)found that Kerala had a sex ratio favourable to females throughout this century. Currently, life expectancy and specific death rate at all ages (except 35-39) are better for women when compared to men in Kerala.

Studies showed that women worked for longer hours and contributed more in terms of total labour energy that was spent by the family members. On account of deeply entrenched social customs, taboos and prejudices, women's work continued to be invisible and confined more to non-monetary activities (Ravindran, 1990).

Tom (1990) reported that in hours of back-breaking labour rural women supplied households with food, water, fuel and housing; and frequently too, generated cash income to satisfy basic household needs. yet rural women were likely to be numbered among the least healthy, least educated and lowest in the local

chain of access to food. Saha and Kanchan (1991) reported that rural women spent maximum time for domestic work (average 11 hours daily) due to lack of proper fuel supply, cooking facilities, cleaning of utensils and rooms and also lack of modern living facilities.

2.7 Present role and status of fisherwomen

A study conducted by Natapracha and Pietersz, (1984) elicited facts regarding the daily marketing operations of the fisherwomen. It showed that the target for credit levels was appropriate for the women in the target group, who were engaged in both fresh and dried fish marketing in Adirampattinam.

Ambarasan (1985) studied the factors that influenced the role and status of fisherwomen in Tamil Nadu. He identified the status of women in the family and society as one of the major reasons for their poor health and nutrition. According to this study, fish in many families was served mainly to the men and there might be little or nothing left for the women. Templeman (1985) found that in two out of three fishermen households, in Andhra Pradesh women undertook income earning activities, like fish marketing (70.00 per cent). Fish marketing was by far the most profitable income earning activity of fisherwomen in Andhra Pradesh.

Kalavathy (1985) reported that the modernization of fishing technology and fish transport in Madras had significantly

benefited the fisherwomen by way of higher earnings and new earning opportunities, and also aggravated income disparities among fisherwomen. Drews (1985) studied the income earning activities of women from fishing communities in Srilanka. The study found that only 8.00 per cent of the women were engaged in activities related to fishing such as fish trade, fishy handling and processing or back water fishing. The study further revealed that the extent of women's participation in these activities varied according to the economic development of the region, the level of technology applied, existing infrastructure and cultural religious backgrounds, as well as topographical conditions.

FAO (1986) studied the role of women in small scale fisheries. It aimed at drawing attention to their vital contribution to food supplies and the need to improve the quality of life within small, poor fishing communities. Natapracha (1986) studied the fisherwomen's activities in Bangladesh. Income generating activities such as net making, fish culture, poultry and goat rearing, were introduced among the fisherwomen. Natapracha and williams (1986) reported that in Bangladesh, fisherwomen were heavily engaged in fish marketing and had to cope with their family, living in a stressful environment of extreme poverty.

Drews (1986) conducted a training for fisherwomen which aimed at making the women aware that they played an important role in the distribution of fish in the coastal belt and in

boosting the family income because fish handling and fish marketing activities were generally assigned to a low social status.

According to Yap (1987) Women's participation in marine fisheries was confined mainly to shore based activities, such as net making, fish handling (sorting, weighing, gutting and icing), fish trade, distribution and processing. The present involvement of women in predominantly shore based activities was frequently not a result of deliberate attempts to exclude them from fish capture, though there was some bias against recruiting women for commercial fishing.

Participation of Indian fishermen both in fishing related and non-fishing related activities was there to some extent. The fishing related activities included fish marketing, fish drying or curing, shrimp processing, net making or mending, fish culture, hand picking of prawns, collection of sea weeds etc. Only a fewer percentage of fisherwomen engaged themselves in tailoring, handicrafts, coir making, weaving and selling of fire wood (Sukumar *et al.*, 1987). Jagatheesan (1987) found that the Tamil Nadu fisherwomen were generally engaged in some of the income generating fishing related activities like net making, net mending, fish handling and dry fish preparation and fish marketing. In addition to the tasks performed at home,the fisherwomen of Tamil Nadu engaged in other productive activities

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which included net making, net mending, fish handling, dry fish preparations and marketing (Sukumar *et al.*, 1991).

Selvaraj *et al.* (1987) focussed their attention on the training needs of fisherwomen and the practical problems in organizing training programmes. They found that the fishing households suffered from economic problems like under employment and poverty and social problems like dowry and alcoholism. Champman (1987) found that the women of Oceana were engaged in fishing. The highly regular nature of women's fishing made them more reliable and therefore more effective than men as suppliers of protein for subsistence.

Williams (1988) studied women's participation in the fish industry in Nigeria. He found that approximately 73.00 per cent of the labour force engaged in the processing, distribution and marketing of fish products from traditional artisan fisheries were women. Active participation of these women aimed at supplementing the traditional fishermen's low income. The fishermen's wives were therefore encouraged to increase the amount of time devoted to market work, thereby decreasing the time spent on home production and leisure. Women managed to make an income from fishing and related activities such as marketing not because they wanted to, but because it was essential to their own and their family's livelihood (Anon., 1989a).

2.8 Factors influencing the nutritional status of women

2.8.1 Nutritional Status

Suter and Hunter (1980) had stated that nutritional status refers to both the types and amounts of nutrients available in the body and the body's utilization of nutrients. Nutritional status was reported to be influenced by factors such as psychological, socio-cultural and physiological influences and also by thoughts, beliefs and emotions.

A research work carried out in different parts of India by ICMR (1981) had revealed that an adequate diet or a balanced diet which provided all the essential nutrients in sufficient quantities and in proper proportions to meet the needs of the body would result in optimum nutritional status.

According to Krishna (1988), nutritional status is an indicator of socio-economic well being of a community. The author reported that a majority of the population who belonged to fishermen community was not able to fulfil the requirements, of calories and proteins.

According to Wadkar *et al*. (1988) balanced diet including protective foods was essential to protect human body from deficiency and other diseases and to prevent body deformities.

Dodd and Aujula (1989), compared the nutritional status of working and non-working middle class Maharashtrian women. Weight

and height showed that 10.00 per cent of the working women and 15.00 per cent of non-working women had weight less than 38 kgs and height less than 145 cms.

NIN (1991) found that Body Mass Index (BMI) expressed as ratio of weight to height square could be a good parameter to grade Chronic Energy Deficiency (CED) in adults. Antia (1989) had reported that the Body Mass Index of women was noted from 19 to 24.

2.8.2 Factors affecting nutritional status

Kumar *et al.* (1976) reported that family size has been shown to influence the nutritional status of individuals of low socio-economic groups. Pandey *et al.* (1977) stated that deficient calorie intake was the main nutritional problem among the farm women resulting in mal-nutrition.

There was a high correlation between poverty and malnutrition, as well as ill health, ignorance and lack of political power (Anon., 1979).

Sadasivan *et al.* (1980) conducted a diet survey in the village Veerapandi, Coimbatore and its biochemical evaluation of diet revealed the presence of calorie deficiency among women of the selected families. The deficiency of Vitamin A, B1, B2 and C was found to be due to the low intake of green leafy vegetables, fruits and milk and all these factors were found to influence the nutritional status.

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Thimmayamma (1983) reported that large family size resulted in improper food distribution among family members mainly due to low purchasing power, faulty food habits and taboos, early marriages, repeated pregnancies and short interval between deliveries and low weight during pregnancy, all contributed a lot to the poor nutritional status of women.

Aujula *et al.* (1983) observed that energy consumption was below the body requirement of the women due to factors like low income and large families among the labour class.

Ramadasmurthy *et al.* (1983) studied the nutrition profile and scope for nutrition education among industrial workers. They observed that working efficiency and work output were very much dependent on the health and physical fitness of the individual. Provision for nutritionally adequate diets for workers was appreciated not only as an important forward step in social practice but also for increasing industrial efficiency.

Behrman and Deolalikar (1986) found that seasonal variations in environmental conditions, food availability, food prices and labour demands have considerable impact on nutrition and health status of women.

Chakkaphak, (1986) reported that insufficiency in food consumption particularly in terms of quality was still a main problem resulting in malnutrition among these families. Due to poverty and lack of knowledge in nutrition, they tend to sell

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their food products and often buy less nutritious food and other luxury items.

Ghosh (1989) reported that social factors were important in the maintenance of health, and that religion, occupation, economic condition, education, beliefs and culture had important bearings on health.

UNICEF (1990) reported that malnutrition resulted from the inadequate intake of nutrients or from disease factors that affected digestion, absorption, transport and the utilization of nutrients. Infectious diseases, in particular, affect both dietary intake and other processes.

UNICEF (1990a) found that dietary inadequacies might be caused by an inadequate intake of foods by mothers having too little time to prepare food, and further reported that inadequate or improper education, particularly of women, was often an underlying cause of malnutrition.

Venkateswara Rao (1991) reported that poor health condition resulted due to poverty. People living in the rural areas and urban areas were not able to lead a life worthy of human beings due to poverty. This health condition was the result of the pernicious combination of several socio- economic factors like unemployment, lack of material advancement, poor housing, poor sanitation, malnutrition, social apathy, absence of will power

and initiative to change for the better etc. The low purchasing power did not allow them to maintain good health.

2.8.3 Nutritional problems

WHO (1979) has defined nutritional anaemia as a condition in which the haemoglobin content of the blood was lower than normal as a result of a deficiency of one or more essential nutrients, regardless of the cause of such deficiency.

Rajammal (1981) made an attempt to present the nutritional status and nutritional problems of fishermen households of the coastal areas of Kerala and Tamil Nadu. She was of the view that the nutritional improvement of fishermen could come about only as a part and parcel of an overall programme of socio-economic development.

Patel (1982) reported that two third of Asian women were perpetually undernourished and a majority were suffering from anaemia.

Among the nutritional diseases iron deficiency anaemia was a major concern in many developing countries. Severe anaemia was claimed to impair work capacity, learning ability and immune functions (Anon., 1983). Vijayalakshmi and Selvasundari (1983) studied the relationship between iron deficiency anaemia and energy expenditure of young adult women. They reported that those who consumed two meals per day were more prone to iron

deficiency anaemia than the subjects who were used to a three meal pattern. The anaemic persons consumed less leafy vegetables and pulses than the required quantity. The intake of energy, iron and retinol were inadequate. The mean haemoglobin values of the subjects in the anaemic group were found to be only 9.7 g/100ml.

Hartmann (1983) studied the dietary habits of fishermen families in Andhra Pradesh and reported that it seemed to be far from satisfactory. As a result most of the villagers especially children suffered from very high degrees of malnutrition, including vitamin deficiency disorders.

Jayam (1984) conducted a survey to identify the main illness and nutritional deficiency diseases prevalent among fisherfolk in Kanyakumari district. She found that a considerable number of women and children suffered from partial blindness because of vitamin A deficiency.

Vijayalakshmi and Jayanthi (1986) reported that iron supplementation conserved energy and the work output increased after supplementation; suggesting that anaemia decreased productivity and supplementation with iron improved work output. Iron supplementation was definitely beneficial to working population groups and their work out put could be remarkably increased by suitable supplementations.

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Elima and Usha (1989) reported that inadequacy in the intake of basic foods was the root cause of widely prevalent malnutrition among women in the country.

According to Bernardo *et al.* (1989) under nutrition due to low food intake, was one of the four major causes of under nutrition in Asia. The four diseases viz., nutritional anaemia, xerophthalmia, protein energy malnutrition and endemic goitre were caused generally by the deficiencies of specific nutrients in the diet even when the content of calories was adequate.

2.8.4 Dietary pattern

Drewes (1982) found that the fishermen families of Tamil Nadu consumed vegetables, meat and milk occasionally and nearly 60.00 per cent of the families went without any meal on some days.

Paramjit *et al.* (1983) studied the nutrient intake of women among different income, occupation and family size categories in two villages of Hoshiarpur district. He found that the intake of protein was much higher than the recommended allowances in all groups and vitamin A was below the recommended level in low income groups and vitamin C and niacin were below the recommended level in all the income, occupation and family size categories showing the consumption of imbalanced diets in all the above stated categories.

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Bhavani (1986) observed the food and nutritional status of small scale fishermen families in India's east coast states. Fish was easily available to fisherfolk and therefore it was expected that their nutritional status would be better than that of the other low income groups. Though fish was a good source of protein and micronutrients, only cereals could meet their energy (calorie) needs. In order to buy cereals and other daily needs they had to sell their catch. Fishing was a seasonal occupation with highly fluctuating income, hence the fishermen population sometimes had little money even to meet their normal food requirements.

Preet and Bhavana (1988) studied the dietary pattern and nutritional status of women residing in Hoshiarpur. They found that the diets of the population in question were deficient in energy, vitamin A and riboflavin. The diets were marginally deficient in Vitamin C and niacin, while the intake of protein, calcium, iron and thiamine were quite satisfactory. The inadequate intake of cereals, sugar and fats could be the cause of energy deficit.

Krishna (1988) studied the food consumption pattern of the marine fishermen in Cochin. It seemed that their diet consisted mainly of rice and fish which met only 75.00 per cent of the calories and 50.00 per cent of the calorie needs of the body. The quantity and frequency of consumption of other protein foods such as egg, meat and milk were low and foods like vegetables

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which formed the major source of vitamins and iron were rarely included in the diet.

Wadkar *et al.* (1988) studied the dietary pattern of families in Sindhudurg, Maharashtra. They found that total calorie consumption was below the needed minimum, while protein intake was more than the required minimum. Their diet was imbalanced with respect to calorie - protein ratio.

Garg and Yadav (1989) measured the rate of protein consumption in Haryana. He found that about 75.00 per cent of the total protein intake came from cereals, milk, ghee, meat, eggs and pulses and the remainder from vegetables.

Mohiuddin (1989) observed the food consumption and nutritional deficiency diseases among the people residing in some villages of Uttar Pradesh. It was reported that although the diet of the women was adequate in most respects it did not necessarily insure adequate nutrition. There was a general deficiency of Vitamin A, with which diseases like anaemia, scurvy and night blindness were associated. The very poor were usually the most vulnerable to nutrient deficiency.

Mathew and Sarita (1989) conducted a study on food consumption pattern and nutritional status of female industrial workers. Nutritional composition of the diet showed that only 67.00 per cent of the calorie requirements were far below the Recommended Daily Allowances (RDA). Amount of total protein

present in their diet was found more than the RDA. They further found that only 11.00 per cent of the subjects were free from visible symptoms of deficiency diseases, while remaining 89.00 per cent of the subjects suffered from mild or moderate form of anaemia.

MATERIALS AND METHODS

MATERIALS AND METHODS

The study on the "Nutritional status of women engaged in fishvending in Trivandrum district" envisages an assessment of socio-economic status of their families; their food consumption pattern and the influence of the above factors on their nutritional status.

3.1 Area of study

Valiyaveli village, being a typical village of fishermen community of Kerala was selected for the present study. This village is located about 12kms north-west of Trivandrum city.

3.2 Selection of families

There are 573 families residing in Valiyaveli village. A list of the families in the village was prepared initially, with the help of a local voluntary organization. In all the families, women were engaged in fishvending. Out of this 150 families were selected at random for the study. For detailed study, 15 families were selected at random from the 150 families.

3.3 Plan of action

The study comprises a documentation of systematic investigations on a macro sample of 150 families and a micro sample of 15 women engaged in fishvending.

3.3.1 Investigations on macro samples (150)

1. Survey to ascertain the socio-economic characteristics of the families.
2. Food consumption survey
3. Survey to identify the socio-economic status of the women engaged in fishvending.
4. Inventory survey to determine the daily time utilization pattern of the women
5. Inventory survey to determine the energy expenditure pattern of the women.
6. Anthropometic measurements and clinical examination of the fisherwomen to assess their nutritional status.

3.3.2 Investigations on micro-sample (15)

1. Actual food intake
2. Bio-chemical profile
3. Energy expenditure pattern

3.4 Tools selected for data collection

Internationally accepted tools based on earlier studies were selected for data collection in the present study.

3.4.1 Oral questionnaire

In the questionnaire method either the investigator or the respondent fills up the schedule (Nageswara Rao, 1979). Evans and Divan (1985) found that there was no significant difference

among different methods like oral recall, printed questionnaire and interview method. In the present study oral questionnaire method which is the most commonly used method to conduct surveys among large number of families in a relatively short time was used for collecting information regarding the socio-economic characteristics, food consumption pattern of the families, socio-economic status and dietary habits of the fisherwomen and for determining their time utilization pattern.

The schedules formulated for data collection (as listed below) were pre tested and details are presented in Appendices I,II,III and IV.

(i) Schedule given in Appendix I comprises information on the social status, size and composition of the family, employment status and occupations taken up by the family members, family income and expenditure pattern.

(ii) Schedule given in Appendix II was used to collect information on food consumption pattern of the families with respect to their food habits, food expenditure pattern, frequency of use of various foods, details regarding method of cooking of foods, type of cooking vessels used, daily meal pattern of the family and special foods included during specific physiological conditions and special occasions.

(iii) Schedule given in Appendix III was used to elicit information on personal characteristics of the women which

may influence their nutritional status viz., age, educational level, marital status, personal income, mode of fishvending during normal and special conditions and their personal habits.

(iv) Schedule given in Appendix IV was used to elicit information regarding the time utilization pattern of the fisherwomen with reference to their daily work schedule, including time spent for household and fishvending activities, for leisure and sleep.

Anthropometric measurements, presence of clinical signs and symptoms, actual food intake and biochemical estimations which are widely used as direct parameters of nutritional status (Swaminathan, 1986) were employed in this study to assess the nutritional status of the fisherwomen. The tools for the above investigations are detailed below.

3.4.2 Anthropometry

Body weight and height of the fisherwomen were measured, following standard techniques suggested by Vijayaraghavan (1987) and compared with that of reference Indian woman (ICMR, 1989). Body Mass Index of the women were worked out using the formula Weight/Height^2 (Wt/Ht^2).

3.4.3 Clinical examination

All the 150 women selected for the study were subjected to clinical examination by a qualified medical practitioner.

Clinical examination is an important practical method of assessing nutritional status. This is based on examination of changes that can be seen or felt in superficial epithelial tissues especially in the skin, eyes, hair and buccal mucus or in organs near the surface of the body (Whiteheed, 1965).

The schedule used for recording anthropometric measurements and clinical signs are presented in Appendix V.

3.4.4 Actual food intake

Actual quantity of food consumed by an individual is ascertained by food weighment method. Sundararaja *et al.* (1971) reported that weighment method was the ideal choice for assessment of individual's food intake. Shoba (1978) had indicated that individual intake could be measured accurately only by actual weighing of food items consumed. Rajammal and Parvathi (1986) found that food weighment method was the most reliable method to assess the actual food intake of an individual.

The schedule used for recording actual food intake is presented in Appendix VI.

3.4.5 Biochemical estimations

Biochemical estimations is a direct method to assess nutritional status. Biochemical measurements selected for the

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study were estimation of haemoglobin, total protein, albumin and vitamin A in blood samples collected from 15 subjects. Number of replications taken for laboratory analysis were two.

Haemoglobin content was estimated since it would give reliable information regarding anaemia. Haemoglobin content was estimated by Cyanmethaemoglobin method as described in Manual of laboratory Techniques (NIN, 1983).

Serum protein was estimated since it would indicate three aspects of protein nutrition viz., the relative adequacy of dietary intake, metabolic changes, due to mal nutrition and depletion of body stores of protein. Total protein content of the serum was estimated by Lowry's method described in Manual of Laboratory Techniques (NIN, 1983).

Albumin content of the blood was estimated since it indicates protein mal nutrition and serves as a conformation of a condition already clinically evident. Albumin content of the serum was determine by Micro-Kjeldhal method, described in Manual of Laboratory Techniques (NIN, 1983).

Vitamin A in serum was determined, since it would reflect not only an adequate recent intake but also the exhaustion of liver reserves and indicate prolonged and severe dietary deficiency up to one year (Whiteheed, 1965) Serum vitamin A was determind by Carrprice method described in Manual of Laboratory Techniques (NIN, 1983).

3.4.6 Energy expenditure pattern

The energy expenditure was calculated from the time and activity schedule of selected 15 women. These women were persuaded to enter each and every activity done by them along with the time spent in minutes, for each activity, for three consecutive days in the proforma given in Appendix VII. The energy expenditure was computed by multiplying the time spent on a particular activity by rate of energy expenditure in terms of BMR units, for adult Indian woman doing moderate activity as given by ICMR, 1990. The energy intake was computed from the actual food intake and using the energy value of common Indian foods as given in Nutritive Value of Indian Foods (ICMR, 1991).

From the above data the energy balance was assessed by comparing the energy intake and expenditure and actual standard energy requirement.

3.5 Mode of data collection

Interview method was selected in the study for collecting the details regarding socio-economic characteristics, food consumption pattern of the families and the personal characteristics of the fisherwomen, this method is reported to be a suitable way to proceed systematically and quickly to collect information (Bass *et al.*, 1979). As pointed out by Lindzey (1954), in this method, there is a face to face interchange between interviewer and respondent before elicitng

information. Moreover this is found to be a systematic method by which a person can enter more or less imaginatively into the inner life of a comparative stranger (Rajammal and Kulandaivel, 1975). The information received from an interview schedule was more reliable as the accuracy of the statements could be checked by supplementary questions wherever necessary (Gupta, 1987). Interview-questionnaire has gained popularity in recent years as it is less laborious way of collecting data (Regina, 1972)

3.6 Analysis of data

3.6.1 Developing a"quality of life index" based on selected socio-economic variables

To develop a "quality life index" as suggested by Dhanasekran (1991) certain variables like socio-economic status and other related variables were selected from the data collected through the study. The selected variables were caste, occupational status of the family, total monthly income of the family, per capita monthly income, type of housing, monthly expenditure on food, monthly expenditure on clothing along with educational status and calorie and protein requirement of the fisherwomen. Each of the variables were rated by giving scores. The scores given for each parameter ranged from 0 to 6 depending on the variations observed within the families studied.

Among the social characteristics, caste and education of the fisherwomen are important indicators of quality of life as

reported by Government of India in 1981, where it has been stated that hierarchy of caste groups and educational level of an individual are considered to be important factors hampering economic progress. To study the influence of the factor, scoring system was adopted. Scores assigned for the above parameters are detailed below.

Scoring for caste system

Caste	Score
Scheduled tribes	0
Scheduled castes	1
Other backward communities	2
Forward communities	3

Scoring for educational status

Educational level	Score
Illiterate	0
Dropouts	1
Primary	2
Secondary	3
High school	4
Pre Degree	5
Degree	6

In this study the majority of family members were casual workers engaged in fishing or fishvending. Only very few families were found to have assets in the form of fishing equipment or fishing boat and their access to such facilities were also meagre. Very few persons had regular full time jobs like Government jobs or employment outside the country. Since such variations in the occupational status of the fishermen families could be observed this factor was included as a variable to determine quality of life. The scores assigned for the occupational status were:

Occupational category/family	Score
No work	0
Casual worker (employment for less than 100 days (one member) in a year).	1
Casual worker (employment for less than 100 days (two members) in a year.	2
Casual workers + government job	3
Casual worker + job outside the country with sizable income.	4
Casual worker + government job + job outside the country.	5

Household income is basically related to the quality of life and hence it has been included as an indicator. In this study inorder to nullify the difference caused by the variation in family size and in the number of persons employed in a family, per capita income of the family was also used as a yard stick to measure quality of life. The scores allotted for above two variables were:

Family income in Rs.(monthly)	Score
≤ 1000	0
1001 - 2000	1
2001 - 3000	2
3001 - 4000	3
> 4001	4

Per capita income in Rs. (monthly)	Score
≤ 100	0
101 - 500	1
501 - 900	2
901 - 1300	3
1301 - 1700	4
1701 - 2100	5
> 2101	6

In earlier studies poverty was measured using minimum of calorie requirement as a yard stick which was propounded by the Planning Commission (Mathur, 1982). As per seventh five year plan draft, the recommended nutritional requirements were 2400 calories per person per day in rural areas (Dewett *et al.*, 1990). According to Wadkar *et al.* (1988) an optimum proportion of calories and proteins are necessary for a balanced diet. In this study calorie and protein requirements were considered as the basis for developing the index. Since extensive diets survey carried out in the country had shown that a good proportion of the population belonging to low income groups and the low quality of life was not able to fulfill the requirement of nutrients including the major ones like calories and proteins (Krishna, 1988). The scores given to calorie and protein requirements were:

Calorie requirement per day (Kcals)	Score
≤ 1500	0
1501 - 1800	1
1801 - 2100	2
2101 - 2400	3
2401 - 2700	4
2701 - 3000	5
> 3000	6

Protein requirement per day (gm)	Score
≤ 30	0
31 - 35	1
36 - 40	2
41 - 45	3
46 - 50	4
51 - 55	5
56 - 60	6

The economic status of a family can also be determined by the food expenditure pattern. It is an accepted fact that poor households will spend higher proportion of income on food. Lipton (1989) in his study on under nutrition and poverty had observed similar findings. Rao (1987) had also reported similar results. The scores allocated to this variable in the present study were:

Food expenditure in percentage of income (monthly)	Score
≤ 75	0
71 - 74	1
65 - 70	2
61 - 64	3
55 - 60	4
51 - 54	5
≤ 50	6

Next to food, clothing and shelter were considered as two factors essential to meet the basic needs of a family. Moreover, poverty could be reflected in the form of clothing, so the per capita expenditure on clothing was also included as an indicator of quality of life. The scores assigned for the above variable are detailed below.

Per capita expenditure on clothing (monthly)	Score
≤ 4	0
5 - 14	1
15 - 24	2
25 - 34	3
35 - 44	4
45 - 54	5
≥ 55	6

The quality of life of an individual could be determined by the type of shelter available to him/her. Non availability of shelter may reflect low socio-economic status. A certain minimum standard for housing is essential for healthy and civilized existence. The development of housing, therefore, must enjoy high priority in poor society such as ours where housing amenities are far below the minimum standards that have been internationally accepted (Government of India, 1985). Hence the type of housing was also accounted as an indicator and the scores allotted for the nature of shelter is detailed below.

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Type of Housing	Score
One room apartment	0
One room with kitchen	1
One room with kitchen and bath room	2
One room with kitchen and latrine	3
One room with kitchen, latrine and bath room	4
More than one room with kitchen and latrine	5

Scores assigned for each parameter for a family when summed up would give the total score for that family. Sum total of the score of a family would give the quality life index of that particular family. Maximum score that can be obtained by a family by this calculation is 53. Total scores were thus worked out for all the 150 families surveyed. Based on the total scores obtained by the families, the selected families for the study were classified into 4 groups as done by Dhanasekaran (1991) inorder to find out the quality of life and also to determine their level of poverty.

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3.6.2 Projection on the maximum and minimum essential expenditure on food for the selected fishermen families

The per caput requirement of various food items was calculated by employing the norms recommended for balanced diet by ICMR (1990). This was considered as per caput allowance at the physiological level, which was converted to retail level by making an additional allowance of 10 per cent for kitchen and other wastages and an additional allowance of 12.5 per cent was added to account for post harvest losses. This value was taken as the maximum requirement. The expenditure to meet this maximum requirement was worked out from the local retail cost for buying the components (ICMR, 1984).

Minimum per capita requirement of food was worked out using the ICMR norms of balanced diet and the data available on family composition of 150 families and Aykroyd's co-efficient of conversion. The conversion is worked out using the formula as given below.

$$Cc = \frac{\Sigma cifi}{\Sigma fi}$$ where,

Cc= Coefficient of conversion

Ci= Aykroyd's Co-efficient for each age group

Fi= Proportion of the population in each age group

Using this co-efficient of conversion the per capita minimum requirement was worked out and the expenditure to meet

the minimum requirement of food was worked out from the retail cost for buying the components (ICMR, 1984).

3.6.3 Relationship between selected socio-economic variables and food expenditure pattern

Nutritional status of a population is influenced by expenditure on food. This inturn is influenced by socio-economic and personal variations among the respondents and their families. Hence the correlation between the socio-economic variables (independent variables) and the food expenditure pattern (dependent variables) was worked out. The independent variables selected for the study were:

1 Family size

2 Family income

3 Number of employed persons in the family

4 Age of the fisherwomen

5 Fisherwomen's income.

The dependent variables selected to assess the variations in food expenditure were,

1 Food expenditure on raw food articles

2 Expenditure on purchase of convenient food

3 Expenditure on foods eaten outside the home

3.6.4 Food use frequency score

Frequency of use of different food groups would give and indication to the adequacy of the family diet pattern.

Hence food use frequency was measured on a 5 point scale. On the basis of the frequency of use, the foods were classified into 5 groups and scored as given below,

Frequency of use	Score
Occasionally	1
Once in a week	2
Twice in a week	3
Thrice in a week	4
Daily	5

The total score for each of the food groups was calculated (Reaburn *et al.*, 1979). Based on the percentage score obtained, the food articles were further classified in to 4 groups ie., most frequently used, moderately used, less frequently used and least frequently used foods.

3.6.5 Relationship between selected socio-economic variables and time utilization pattern of the fisherwomen

Time spent for various activities by the fisherwomen is found to be influenced by certain socio-economic variables. To find out the relationship between the socio-economic variables (as in item 3.6.3) on time spent for household, fishvending activities and for leisure and sleep, correlation analysis of the data was carried out.

3.6.6 Relationship between selected socio-economic variables and the amount spent for purchase of fish for sale

Various socio-economic factors directly influenced the amount spent for buying fish daily by the fisherwomen for fishvending. Hence the correlation between the selected socio-economic variables (as in item 3.6.3) and the amount spent for buying fish was worked out.

3.6.7 Developing Nutritional Status Index (NSI) (150)

In the present study for developing the nutritional status index of the fisherwomen, their height, weight and Body Mass Index (BMI) were taken into consideration.

Suppose xij be the observation corresponding to the j^{th} variable for the i^{th} sample $wj = 1/\sigma j^2$, the weight assigned to the observation corresponding to j^{th} variable the nutritional status of i^{th} individual is calculated as follows

$$Ni = \sum^{k} wi \; X \; ij,$$

$i = 1,2,\ldots\ldots, N$

N = No. of respondents

K = No. of variables

Nutritional status index obtained for each individual was classified as as given below.

Mean − SE	Low
Between mean ± SE	Medium
Mean + SE	High

3.6.8 Relationship between selected socio-economic variables and nutritional status index (150)

Socio-economic status of the family has a forceful impact on the nutritional status of the individual. Hence correlation between selected socio-economic factors (as in item 3.6.3) and nutritional status index of the fisherwomen was carried out.

3.6.9 Relationship between selected socio-economic variable and actual food intake of the fisherwomen (15)

Food intake of an individual or family is related to certain socio-economic factors such as family size, family income, employment status of the family and age and income of the women. In the present study the relationship between the above socio-economic factors and actual food intake of the women was assessed.

3.6.10 Fluctuation in energy expenditure of the fisherwomen (15)

From the data collected energy expenditure pattern at two hour intervals for 3 consecutive days, 2 variables with high energy expenditure variation with in a day were selected. The

energy utilization pattern of each individual was assessed on the basis of the following scoring system.

		Score
Mean − SE	Low	1
Between mean ± SE	Medium	2
Mean + SE	High	3

A graph with the two variables on X axis and Y axis was drawn. The data collected from 15 selected women with these two variables were plotted to draw glyphs.

RESULTS

RESULT

The present study was conducted to assess the nutritional status of women engaged in fishvending in Trivandrum District. The coastal area of Valiyaveli, located about 15 kms from Trivandrum city was selected for the study. Earlier reports had indicated that a high percentage of women in this area were engaged in fishvending activities, when compared to other areas in and around Trivandrum city.

One hundred and fifty families of women who were involved in fishvending, were selected at random for the study. Data collected were analyzed and the results are presented under the following headings.

1. Socio-economic profile of the fishermen families
2. Food consumption pattern of the families
3. Time utilization pattern of the women engaged in fishvending
4. Energy expenditure pattern of the women engaged in fishvending
5. Nutritional status of the selected fisherwomen.

4.1 Socio- economic profile of the fishermen families

The socio-economic profile of the fishermen families were studied with reference to their social status, occupational status, economic status and monthly per capita expenditure.

4.1.1 Social status of the fishermen families

The socio-economic survey of the 150 families revealed that all of them followed the religion of Christianity and they all belonged to the Mukkuva caste. It was also observed that they all followed the patriarchal family system.

Social status of the fishermen families are presented in Table 2. It was found that 93.33 per cent of the families were male headed and 6.67 per cent were female headed. Nuclear type (64.00 per cent) and joint families (36.00 per cent) were observed in this community. When the family size was analyzed, it was seen that 72.00 per cent of the families had less than five members while 28.00 per cent of the families had more than 5 members. Hence the latter could be considered as large families.

It was found that in 6.67 per cent of the families, only one member (respondent alone) was employed and in 73.33 per cent of the families two members (respondent and head of the family) were employed. In 20.00 per cent of the families more than two members were employed. As revealed in Table 2, in joint families and larger families, more members in each family were employed when compared to nuclear families.

Age and sex based distribution of the population as presented in Table 3 revealed that in all age groups except in 1 to 3 and 4 to 6 years, there were more male members than females. The 150 families surveyed had a total population of 834 members.

Table 2 Social Status of the fishermen families

Particulars	Family Head			Employment Status			
	Male	Female (Respondent)	Total	Respondent alone	Respondent and head of the family	Respondent and adult members	Total
Type of family							
Nuclear	89 (59.33)	7 (4.67)	96 (64.00)	7 (4.67)	83 (55.33)	6 (4.00)	96 (64.00)
Joint	51 (34.00)	3 (2.00)	54 (36.00)	3 (2.00)	27 (18.00)	24 (16.00)	54 (36.00)
Total	140 (93.33)	10 (6.67)	150 (100)	10 (6.67)	110 (73.33)	30 (20.00)	150 (100)
Family size							
Below 5	99 (66.00)	9 (6.00)	108 (72.00)	8 (5.33)	85 (60.66)	15 (10.00)	108 (72.00)
Above 5	41 (27.33)	1 (0.67)	42 (28.00)	2 (1.33)	25 (16.67)	15 (10.00)	42 (28.00)
Total	140 (93.33)	10 (6.67)	150 (100)	10 (6.67)	110 (73.33)	30 (20.00)	150 (100)

Numbers in paranthesis indicate percentage of families.

Table 3 Age and sex wise distribution of the members of the fishermen families

Age (Years)	Distribution within the male population		Distribution within the female population		Distribution in the total population (%)		Total		Avera members a fami
	No.	Per cent	No.	Per cent	Male	Female	No.	Per cent	
Above 18	253	57.89	236	59.45	30.33	28.30	489	58.63	3.26
16-18	30	6.86	15	3.78	3.59	1.80	45	5.40	0.30
13-15	37	8.46	30	7.56	4.44	3.60	67	8.03	0.45
10-12	38	8.69	36	9.06	4.56	4.32	74	8.87	0.49
7-9	37	8.47	24	6.05	4.44	2.87	61	7.31	0.40
4-6	16	3.67	29	7.30	1.92	3.48	45	5.40	0.30
1-3	20	4.58	24	6.05	2.40	2.87	44	5.28	0.29
6-12 months	2	0.46	1	0.25	0.24	0.12	3	0.36	0.02
0-6 months	4	0.92	2	0.50	0.48	0.24	6	0.72	0.04
Total	437	100	397	100	52.40	47.60	834	100	5.55

Sex ratio of this population was found to be 908 females for 1000 males. On further analysis it revealed that the population matrix consisted of 58.63 per cent adults and 41. 37 per cent children (below the age of 18 years). When the age and sex of the selected population were examined in detail, it revealed that, of the total population, 30.33 per cent were adult males, 28.30 per cent were adult females and the remaining were children and the average family size was 6 (to be exact 5.55). The general composition revealed that the school going age groups predominated. It also revealed that the infants below one year were less than one per cent and the pre-schoolers consisted of 5.64 per cent of the population, while the adolescents were 5.40 per cent.

4.1.2 Occupational status of the fishermen families

Table 4 indicates the occupational status of the family members and fish marketing pattern adopted by these families. In addition to fishvending, these families were engaged in other occupations like fishing (75.33 per cent), coolie (5.33 per cent), government job (0.67 per cent), employment outside the country (2.00 per cent), fishing and coolie (4.65 per cent), fishing and government job (0.67 per cent), fishing and business (0.67 per cent), fishing and employment outside the country (2.67 per cent), fishing, coolie and employment outside the country (0.67 per cent) and fishing, government job and employment

Table 4 Occupational status of family members and the fish marketing pattern by the fishermen families

Occupational status of family members	Fish marketing pattern: Catch pooled among few families and marketed	Catch handed over to local contractor and later purchased for marketing	Purchasing fish from major market located in the city and marketing	Total
Fishvending alone	–	5 (3.33)	5 (3.33)	10 (6.67)
Fishvending and fishing	1 (0.67)	48 (32.00)	64 (42.60)	113 (75.33)
Fishvending and coolie	–	1 (0.67)	7 (4.66)	8 (5.33)
Fishvending and government job	–	–	1 (0.67)	1 (0.67
Fishvending and employement outside the country	–	–	3 (2.00)	3 (2.00
Fishvending, fishing and coolie	–	5 (3.33)	2 (1.33)	7 (4.65
Fishvending, fishing and government job	–	–	1 (0.67)	1 (0.67
Fishvending, fishing and business	–	–	1 (0.67)	4 (0.67
Fishvending, fishing and employment outside the country	1 (0.67)	1 (0.67)	2 (1.33)	4 (2.67
Fishvending, fishing, coolie and employment outside the country	–	–	1 (0.67)	1 (0.67
Fishvending, fishing government job and employment outside the country	–	1 (0.67)	–	1 (0.67
Total	2 (1.33)	61 (40.67)	87 (58.00)	150 (100)

Numbers in parenthesis indicate percentage of families

outside the country (0.67 per cent), while in 6.67 per cent of the families only women were engaged in fishvending.

Fish marketing pattern of the families revealed that only 1.33 per cent of the families took an initiative for co-operative effort. The catch was pooled among these families and shared for fishvending. In 40.67 per cent of the families, their habit was selling these catch to the local contractors first and later, women of these families purchased from these contractors for marketing while 58.00 per cent of the families purchased fish from the major market located in the city.

Occupational status of the family members and possession of fishing equipment are given in Table 5.

As revealed in the table, the majority of the families (68.00 per cent) did not have any fishing equipment. Only 20.00 per cent of the families had purchased fishing equipment from their own money, while the remaining 12.00 per cent of the families received assistance for the purchase of fishing equipment from other sources as loans from the government (0.67 per cent), voluntary organizations (0.67 per cent), as dowry (0.67 per cent), loans either from various banks (1.33 per cent) or from private money lenders (8.66 per cent).

4.1.3 Economic status of the fishermen families

Economic status of the fishermen families is presented in Table 6. The main source of income of 80.00 per cent of the

Table 5 Occupational status of family members and possession of fishing equipment

Occupational status of family members	Type of fishing equipment				
	Kattamaram	Fishing net (of different kinds)	Fishing boat	No fishing equipment	Total
Fishvending alone	–	–	–	10 (0.67)	10 (6.67)
Fishvending and fishing	1 (0.67)	39 (26.00)	1 (0.67)	72 (48.00)	113 (75.33)
Fishvending and coolie	–	1 (0.67)	–	7 (4.66)	8 (5.33)
Fishvending and government job	–	–	–	1 (0.67)	1 (0.67)
Fishvending and employement outside the country	–	–	–	3 (2.00)	3 (2.00)
Fishvending, fishing and coolie	1 (0.67)	1 (0.67)	–	5 (3.33)	7 (4.66)
Fishvending, fishing and government job	–	–	–	1 (0.67)	1 (0.67)
Fishvending, fishing and business	–	1 (0.67)	–	–	1 (0.67)
Fishvending, fishing and employment outside the country	–	3 (2.00)	–	1 (0.67)	4 (2.66)
Fishvending, fishing, coolie and employment outside the country	–	–	–	1 (0.67)	1 (0.67)
Fishvending, fishing, government job and employment outside the country	–	–	–	1 (0.67)	1 (0.67)
Total	2 (1.33)	45 (30.00)	1 (0.67)	102 (68.00)	150 (100)

Numbers in parenthesis indicate percentage of families

Table 6 Economic status of the fishermen families

Income (Rs.)	Sources		Total
	Regular employment	Other sources	
≤1000	9 (6.00)	–	9 (6.00)
1001–2000	95 (63.33)	11 (7.33)	106 (70.67)
2001–3000	15 (10.00)	12 (8.00)	27 (18.00)
≥3001	1 (0.67)	7 (4.67)	8 (5.33)
Total	120 (80.00)	30 (20.00)	150 (100)

Numbers in parenthesis indicate percentage of families

families was from their regular employment viz., fishing and fishvending. Twenty per cent of the families earned income from other sources like business, government jobs, coolie, work and employment outside the country, over and above the income they earned from fishing and fishvending. It was found that none of the families earned any income from land or from other home based occupations. Six per cent of the families had a monthly income below Rs. 1000/-. Most of the families belonged to the monthly income range between Rs.1001–2000 (70.67 per cent). Eighteen per cent of the families was in the income range of Rs.2001 to Rs.3000 and a high income level above Rs. 3001 per month was

observed only in 5.33 per cent families. It was also found that about 2.00 per cent of the families had an income below Rs. 9000 per annum indicating that they fell below the poverty line.

The majority of the families (96.00 per cent) had their own houses and the remaining (4.00 per cent) were staying in rented houses. Table 7 indicates the facilities available in the houses. It revealed that 32.67 per cent of the families resided in one room apartments and 39.33 per cent of the families in one room apartments with separate kitchen facilities, while, 22.67 per cent of the households had one room apartments with latrine and bathroom facilities. Only 5.33 per cent had houses with separate kitchen, latrine and bathroom facilities.

Table 7 Facilities available in the houses of the fishermen families

Type of house	No.	Percentage
One room apartment	49	32.67
One room with kitchen	59	39.33
One room with kitchen bathroom and latrine	34	22.67
Home with separate kitchen, bathroom and latrine	8	5.33
Total	150	100.00

All the families surveyed depended on the city water supply. They fetched water from public taps to their homes. In

96.00 per cent of the families the respondents were fetching water while in the remaining cases, the women were assisted by adult male members (0.67 per cent), other adult female members (2.66 per cent) and male children (0.67 per cent).

4.1.4 Family composition based on per capita expenditure

The 150 families surveyed had a total population of 834 individuals. Distribution of the households and population on the basis of their total family expenditure pattern (monthly) are presented in Table 8. Among the expenditure classes identified, the population irrespective of age and sex was found to be more concentrated in two groups, viz., Rs.201 to 300 and 301 to 400 and only few families were found in the expenditure class of above Rs. 600/-.

Details pertaining to the working persons available in the families are presented in Table 9. Average number of members in a family belonging to different expenditure classes and corresponding numbers of employed, unemployed and persons not available for work per family were worked out. Of the total population 36.81 per cent members were employed, 21.81 per cent unemployed and 41.37 per cent were not available for work being children or old dependents. The distribution of employed persons showed a corresponding increase up to the expenditure class Rs.301-400 and higher percentage (14.75 per cent) of employed persons were observed in the class Rs. 301-400.

Table 8 Distribution of the families based on their monthly expenditure pattern

Monthly per capita expenditure (Rs.)	No. of families	Adult male	Adult female	Children	Total
≤200	7.01 (4.67)	9 (1.08)	16 (1.92)	20 (2.40)	45 (5.40)
201-300	53.01 (35.34)	98 (11.75)	84 (10.07)	142 (17.02)	324 (38.85)
301-400	59.98 (39.99)	101 (12.11)	88 (10.55)	129 (15.47)	318 (38.13)
401-500	24.00 (16.00)	36 (4.32)	39 (4.67)	50 (6.00)	125 (14.99)
501-600	3.00 (2.00)	5 (0.60)	6 (0.72)	2 (0.24)	13 (1.56)
>601	3.00 (2.00)	4 (0.48)	3 (0.36)	2 (0.23)	9 (1.07)
Total	150 (100)	253 (30.34)	236 (28.30)	345 (41.36)	834 (100)

Numbers in parenthesis indicate percentage

Table 9 Distribution of the family members according to their employment status

Monthly percapita expenditure. (Rs.)	Employed	Unemployed	Persons not available for work	Total
≤ 200	12 (1.44)	13 (1.56)	20 (2.39)	45 (5.39)
201-300	106 (12.71)	76 (9.11)	142 (17.03)	324 (38.85)
301-400	123 (14.75)	66 (7.91)	129 (15.47)	318 (38.13)
401-500	52 (6.23)	23 (2.76)	50 (6.0)	125 (14.99)
501-600	7 (0.84)	4 (0.48)	2 (0.240	13 (1.56)
> 601	7 (0.84)	-	2 (0.24)	9 (1.08)
Total	307 (36.81)	182 (21.82)	345 (41.37)	834 (100)

Numbers in parenthesis indicate percentage.

4.1.5 Monthly expenditure pattern of the fishermen families

A detailed study was conducted to assess the monthly expenditure pattern of the fishermen families for various items and the results are presented in Table 10.

The percentage distribution of consumer expenditure to meet the basic needs such as food, clothing, shelter and fuel of the fishermen family revealed that monthly per capita expenditure on food (in percentage) was gradually decreasing from the lowest expenditure class to the class of Rs 501-600. Proportion of income spent on food was 66.66 per cent for the expenditure class categorized as <Rs.200 while it was 42.01 per cent for the higher expenditure group,> Rs 600.

The expenditure on clothing and shelter was comparatively negligible. Highest expenditure on clothing and shelter was noticed in the expenditure class of Rs.501-600. Expenditure on fuel was also observed to be a basic need for these families. The expenditure on fuel was inversely proportional to the monthly expenditure except in the group of Rs.201-300.

The percentage distribution of expenditure for facilities such as transportation, education, health, electricity and additional facilities revealed that all the families spent 4.89 to 10.18 per cent of their expenditure on transportation. Lowest expenditure for transportation was found in the lowest class

Table 10 Monthly expenditure pattern of the fishermen families

Items	Monthly per capita expenditure (Rs)					
	≤ 200	201-300	301-400	401-500	501-600	>600
Food	107.92(66.60)	128.42(51.78)	163.28(46.71)	183.14(40.37)	216.00(39.65)	285.00(42.01)
Clothing	1.00(0.62)	1.82(0.73)	4.03(1.15)	12.24(2.70)	17.00(3.12)	7.50(1.10)
Shelter	0.18(0.11)	3.67(1.48)	5.11(1.46)	1.92(0.42)	6.25(1.15)	5.00(0.74)
Fuel	11.50(7.09)	12.94(5.21)	24.77(7.09)	32.17(7.09)	20.25(3.72)	18.65(2.74)
Transportation	7.92(4.89)	13.36(5.38)	27.43(7.85)	46.16(10.18	29.50(5.42)	35.55(5.23)
Education	0.66(0.41)	6.29(2.55)	7.88(2.25)	1.17(0.26)	-	5.00(0.74)
Health	0.25(0.15)	0.29(0.12)	0.57(0.16)	1.39(0.31)	1.00(0.18)	-
Eletricity	-	0.09(0.04)	0.30(0.09)	0.64(0.14)	0.50(0.09)	1.42(0.21)
Additional facilities	-	0.32(0.20)	0.47(0.19)	0.34(0.10)	-	-
Repaying loans	0.50(0.31)	11.42(4.60)	27.12(7.77)	11.34(2.50)	26.50(4.86)	32.50(4.78)
Savings	-	3.13(1.26)	10.72(3.07)	8.22(1.81)	-	34.50(5.08)
Personal needs of respondent	16.00(9.88)	23.18(9.35)	27.16(7.80)	54.27(11.96	94.12(17.29	88.50(13.02)
Personal needs of husband	12.50(7.71)	29.36(11.84	28.68(8.21)	72.21(15.92	113.75(20.88)	125.39(18.45)
Personal needs of children	-	3.05(1.23)	2.06(0.59)	2.15(0.47)	1.23(0.23)	5.05(0.75)
Personal needs of other family members	-	0.52(0.21)	0.98(0.28)	2.49(0.55)	2.99(0.53)	-
Ceremonies and festivals	-	0.11(0.04)	0.10(0.03)	2.39(0.53)	1.00(0.18)	-
Food out side home	2.84(1.75)	6.39(2.58)	11.92(3.41)	15.00(3.32)	9.00(1.65)	7.50(1.10)
Convenient foods	-	3.09(1.25)	6.34(1.81)	4.81(1.06)	4.75(0.87)	27.50(4.05)
Gifts	-	0.20(0.08)	0.43(0.10)	1.88(0.41)	1.00(0.18)	-
Entertainment	0.46(0.28)	0.22(0.09)	0.22(0.06)	-	-	-
Total	162.05(100)	248.02(100)	349.54(100)	453.59(100)	544.76(100)	679.56(100)

Numbers in parenthesis indicate percentage of expenditure.

(4.89 per cent) and the highest was observed in the class of Rs.401-500. Expenditure on education was very low and the majority of families spent less than 2.55 per cent of their expenditure on education. Highest expenditure (2.55 per cent) on education was found in the class of Rs.201-300. Expenditure on health ranged from 0.12 to 0.31 per cent. Highest expenditure on health was observed in the class of Rs. 401-500 (0.31 per cent).

Expenditure on electricity was very low and it ranged from 0.04 to 0.21 per cent. Highest expenditure for electricity was observed in the highest expenditure class of >Rs.600.

The distribution of expenditure for the personal needs of the respondents, their husbands, children and other family members indicated that out of the total expenditure 7.80 to 17.29 per cent was spent to meet the personal needs of the respondents. The expenditure to meet the personal needs of their husbands ranged from 7.71 to 20.88 per cent. Expenditure on personal needs of the children and other family members in all the groups was found to be negligible. The highest expenditure on personal needs of the respondents and their husbands was in the expenditure class of Rs.501-600.

The distribution of expenditure for repaying loans and for savings revealed that 0.31 to 7.77 per cent of their expenditure was spent for repaying loans. The highest expenditure for repaying loans was observed in the expenditure class of Rs.301-400. Range of savings of the family was from 1.26 to 5.08 per

cent of their total expenditure. Savings of the family were the highest in the expenditure class of <Rs.600 (5.08 per cent).

The distribution of expenditure for luxuries like ceremonies and festivals, food eaten outside home, purchase of convenient foods and gifts and for entertainments indicated that for ceremonies and festivals they spent from 0.03 to 0.53 per cent of their expenditure. Expenditure on food eaten outside home was 1.10 to 3.41 per cent. Very low expenditure was found in the class of >Rs.600 (1.10 per cent). Much difference was noticed for expenditure on convenience foods among the groups whose expenditure was >Rs.601 when compared to all other groups. Difference in the expenditure on convenient food was observed in the highest class of >Rs.600 (4.05 per cent). Only few families spent their money for giving gifts and it was less then or equal to 0.41 per cent of their expenditure. Expenditure on entertainments was noticed only in the first three expenditure classes.

4.2 Food consumption pattern of the fishermen families

Food consumption pattern of the fishermen families was assessed with respect to the dietary practices of the families, frequency of use of various foods, cooking methods, daily meal pattern of the families and food prepared for special occasions and special conditions.

All the families surveyed were non-vegetarians, fish being the important animal food in their daily diet. The staple food consumed by the families was cereals, especially rice.

4.2.1 Monthly food expenditure pattern of the fishermen families

Food expenditure was the major item of expenditure of the fisherman families. So detailed expenditure on various food items was assessed. Monthly per capita food expenditure pattern of the families is presented in Table 11. Being the major food item, 43.20 to 66.58 per cent of the food expenditure was incurred for the purchase of cereals. Expenditure on this item was found to be inversely proportional to the total expenditure of the families. There was a steady decrease in the percentage of the expenditure on cereals as the total expenditure of the families increased.

Next to cereals maximum amount was spent on coconut. The expenditure on nuts and oil seeds (coconut) was inversely proportional to the total food expenditure of the families. The expenditure on coconut varied from 12.20 to 18.01 per cent of the total expenditure on food.

The expenditure on sugar and jaggery, commercially prepared foods, animal foods, vegetables, pulses and milk and milk products were found to be increasing with increase in total food expenditure, with slight variation in certain groups. Expenditure on roots and tubers, fats and oils and beverages were

Table 11 Monthly food expenditure pattern of the fishermen faillies

Food items	Monthly per capita expenditure(Rs)					
	≤ 200	201-300	301-400	401-500	501-600	> 600
Cereals	71.85(66.58)	66.03(51.42)	77.61(47.53)	85.69(46.79)	96.52(44.69)	123.33(43.20)
Nuts and oil seeds (coconut)	17.21(15.94)	23.13(18.01)	26.63(16.31)	26.67(14.56)	32.55(15.07)	34.83(12.20)
Fruits	-	2.61(2.03)	4.02(2.46)	6.02(3.29)	14.54(6.73)	22.16(7.76)
Milk and milk products	0.69(0.64)	5.83(4.54)	12.68(7.77)	14.50(7.92)	15.75(7.29)	22.03(7.72)
Sugar and jaggery	4.08(3.78)	4.60(3.58)	8.47(5.19)	9.10(4.97)	12.53(5.80)	19.51(6.83)
Meat	3.81(3.53)	4.65(3.62)	6.89(4.22)	9.05(4.94)	10.98(5.08)	13.09(4.55)
Commercially prepared foods	0.67(0.62)	5.50(4.28)	6.64(4.06)	8.10(4.42)	8.87(4.11)	13.60(4.76)
Roots and tubers	3.15(2.92)	4.32(3.36)	6.85(4.20)	6.80(3.71)	5.96(2.76)	5.64(1.99)
Fats and oils	2.65(2.46)	4.18(3.25)	4.83(2.96)	4.39(2.40)	6.52(3.02)	11.26(3.94)
Beverages	2.06(1.91)	4.14(3.22)	3.25(1.99)	5.04(2.75)	5.72(2.65)	7.27(2.55)
Other vegetables	1.75(1.62)	2.27(1.77)	3.65(2.24)	3.19(1.75)	4.19(1.94)	8.57(3.00)
Pulses	-	0.20(0.16)	1.05(0.64)	2.70(1.47)	1.19(0.55)	3.15(1.10)
Egg	-	0.73(0.57)	0.67(0.41)	1.08(0.59)	0.33(0.15)	0.40(0.14)
Green leafy vegetables	-	0.23(0.19)	0.04(0.02)	0.81(0.44)	0.35(0.16)	0.75(0.26)
Total	107.92(100)	128.42(100)	163.28(100)	183.14(100)	216.00(100)	285.50(100)

Numbers in paranthesis indicate percentage of expenditure

not uniform. Fish was consumed from their daily catch or from the remaining fish purchased for vending. So no expenditure was accounted on this item of food in the total food expenditure pattern.

4.2.2 Projection on the maximum and minimum expenditure on food for fishermen families

The per capita requirement of food stuff is one of the important considerations from practical point of view in estimating minimum per capita food expenditure. Employing the norms recommended for balanced diets for various age groups by ICMR (1989), the per caput requirement of various food item was calculated. This per caput allowance at the "physiological level" was converted to the 'retail level' by making an allowance of 10 percent for kitchen and other wastages. The maximum requirement was again worked out by giving an additional allowance of 12.5 per cent for post harvest losses.

Using the data available on population distribution into different age groups, and Aykroyd's coefficient, the per capita requirement was worked out. For the population under study the Aykroyd's coefficient was worked out to be 0.875. Minimum expenditure on food was computed using the data on production level and Aykroyd coefficient. Expenditure to meet maximum and minimum requirement was worked out, by calculating the amount based on local retail price for the components of a balanced

diet. The details are presented in Table 12. As revealed in the table, an amount of Rs.6.82 and Rs.8.52 will be needed, to meet the minimum and maximum per capita dietary allowance.

4.2.3 Relationship between selected socio-economic variables and food expenditure of the fishermen families

Amount spent for purchasing food materials by the fishermen families was mainly influenced by certain socio-economic factors like family size, family income, number of members employed in a family, age of the fisherwomen and fisherwomen's income. Table 13 throws light on the influence of the above variables on expenditure on raw food articles, convenient foods and meals consumed outside home. As revealed in the above table the above factors were found to influence the general expenditure on food. Family size, family income and fisherwomen's income were associated with the expenditure on convenient foods by the families. All the above selected socio-economic factors except the age of the fisherwomen were found to influence the expenditure on foods eaten outside the home.

4.2.4 Frequency of use of different food items by the fishermen families

Data collected to assess the frequency of use of different food items in the daily diet is presented in Table 14. Food items like cereals, nuts and oil seeds (coconut), sugar, fish and beverages like coffee or tea were use daily by all the families.

Table 12 Percapita daily dietary allowance of food recommended and its retail cost.

Food groups	Dietary allowances			Cost for max. requirement (Rs/gm)	Minimum requirement (gm)	Cost for min. requirement (Rs/gm)
	Physiological level (gm)	Retail level (gm)	Production level (max.requirements) (gm)			
Cereals	460	506	517.50	3.10	402.50	2.42
Pulses	40	44	45.00	0.81	35.00	0.63
Leafy vegetables	50	55	56.25	0.17	43.75	0.13
Other vegetables	60	66	67.50	0.27	52.50	0.21
Roots and tubers	50	55	56.25	0.10	35.00	0.10
Milk and milk products	150	165	168.75	0.84	131.25	0.66
Fats and oils	40	44	45.00	1.26	35.00	0.98
Sugar and jaggery	30	33	33.75	0.20	26.25	0.16
Nuts and oil seeds	30	33	33.75	0.51	26.25	0.39
Animal foods	30	33	33.75	0.51	26.25	0.39
Egg(No)	30	33	33.75	0.75	26.25	0.75
Total				8.52		6.82

Table 13 Influence of selected parameters on the food expenditure pattern of the fishermen families

Selected variables	Correlation Coefficient (r)		
	Total expenditure on food	Expenditure on convenient foods	Expenditure on food consumed outside home
Family size	0.6911**	0.1302**	0.2155**
Family income	0.6806**	0.3919**	0.4736**
Number of members employed in a family	0.3618**	0.1553	0.2754**
Age of the fisherwomen	0.3789**	0.1157	0.0673
Fisherwomen's income	0.4247**	0.3521**	0.2591**

** Significant at 1 per cent level

Table 14 Frequency of use of various foods by the fishermen families

Food items	Daily	Thrice in a week	Twice in a week	Once in a week	Occassionally	Never	Total
Cereals	150(100)	-	-	-	-	-	150(100)
Pulses	-	4(2.67)	-	2(1.33)	27(18.00)	117(78.00)	150(100)
Green leafy vegetables	-	2(1.33)	1(0.67)	4(2.67)	28(18.67)	115(76.66)	150(100)
Other vegetables	10(6.67)	2(1.33)	8(5.33)	39(26.00)	65(43.33)	26(17.33)	150(100)
Roots and tubers	24(16.00)	14(9.33)	21(14.00)	20(13.33)	60(40.00)	11(7.33)	150(100)
Fruits	7(4.67)	3(2.00)	3(2.00)	22(14.67)	35(23.33)	80(53.33)	150(100)
Nuts and oil seeds (Coconut)	150.00	-	-	-	-	-	150(100)
Milk	106(70.67)	-	-	-	2(1.33)	42(28.00)	150(100)
Milk products	2(1.33)	-	-	-	3(2.00)	145(96.67)	150(100)
Fat and oils	-	-	-	-	150(100)	-	150(100)
Sugar and jaggery	150(100)	-	-	-	-	-	150(100)
Egg	-	1(0.67)	-	1(0.67)	3(2.00)	145(96.67)	150(100)
Meat	-	-	-	107(71.33)	38(25.33)	5(3.33)	150(100)
Fish	150(100)	-	-	-	-	-	150(100)
Beverages	150(100)	-	-	-	-	-	150(100)
Commercially prepared foods	-	-	-	-	112(74.67)	38(25.33)	150(100)

Numbers in parenthesis indicate percentage of families

Most of the families (70.67 per cent) used milk in their daily diet. Milk and sugar were consumed as an ingredient of coffee or tea which they bought either from the tea shop or prepared at home. Food articles like other vegetables, roots and tubers and fruits were included daily by very few families ie., 6.67, 16.00 and 4.67 per cent respectively. Majority of the families never used the food items like pulses (78.00 per cent), green leafy vegetables (76.66 per cent), fruits (53.33 per cent) and egg (96.67 per cent). Fats and oils and commercially prepared food articles were consumed occasionally by these families (100 and 74.67 per cent). Meat was consumed only once in a week by 71.33 per cent of the families.

It is seen that the diets are not balanced when compared to ICMR recommendations. Only 2.67 per cent of the families included 80 per cent of the components of a balanced diet. While 14.00 per cent included 70.00 per cent. Sixty per cent of the components were included daily in the diet by 58.00 per cent of the families while 24.66 and 0.67 per cent of the families included only 50.00 and 40.00 per cent respectively.

Frequency of use of various food items was measured in a 5 point scale. Mean scores obtained for each food item on the basis of frequency of use are given in Table 15. As indicated in table only five food items ie, cereals, nuts and oil seeds, sugar and jaggery, fish and beverages were found to obtain a mean score of 5. Mean percentage score over total score for these

Table 15 Scores obtained for various food articles

Food items	Mean score	Mean % score over total score
Cereals	5.00	100.00
Pulses	0.31	6.20
Green leafy vegetables	0.31	6.20
Other vegetables	1.50	30.00
Roots and tubers	2.46	49.20
Fruits	0.77	15.40
Nuts and oil seeds	5.00	100.00
Milk	3.56	71.20
Milk products	0.08	1.70
Fats and oils	1.00	20.00
Sugar and jaggery	5.00	100.00
Egg	0.06	1.20
Meat	1.68	33.60
Fish	5.00	100.00
Beverages	5.00	100.00
Commercially prepared foods	0.75	15.00

foods was 100. There was fluctuation in the mean score obtained for each food article, depending on its frequency of use.

Based on the percentage scores obtained, the food articles were further classified into four groups ie., most frequently used foods, moderately used foods, less frequently used foods and least frequently used foods. The details are presented in Table16.

Table 16 Classification of food items based on food scores

Scores	Food items
Daily used foods (76-100)	Cereals, nuts and oil seeds (coconut), sugar and jaggery, fish and beverages.
Moderately used foods (51-75)	Milk and milk products
Less frequently used foods(26-50)	Other vegetables, roots and tubers and meat.
Least frequently used foods(≤25)	Pulses, green leafy vegetables, fruits, fats and oils, egg and commercially prepared foods.

Cereals, nuts and oil seeds (Coconut), sugar and jaggery, fish and beverages were found to be the most frequently used food items, while foods like pulses, green leaf vegetables, fruits, milk products, fats and oils, egg and commercially prepared foods were the least frequently used food items.

4.2.5 Relationship between selected socio-economic variables and food use frequency

Table 17 depicts the association between the selected socio-economic variables and frequency of use of various food items. It is seen that the family income negatively influences the frequency of use of all food articles. This was significant in the case of green leafy vegetables, other vegetables and milk. Fisherwomen's income is also negatively correlated with the frequency of use of milk at 5 per cent level. All other food items show no significant association with the selected parameters, such as family size, number of members employed in a family and age of the fisherwomen.

4.2.6 Food habits of the fishermen families

Meal pattern, foods given during special occasions and special conditions including periods of illness and cooking practices are presented under food habits of the fishermen families.

Seventy six per cent of the families had the habit of consuming three meals a day namely, breakfast, lunch and dinner and rest of the families (24.00 per cent) had only 2 meals a day.

Daily food consumption pattern of the families was collected and is presented in Table 18. Majority of the families had the habit of taking black coffee early in the

Table 17 Association between selected parameters and frequency of use of different food items by fishermen families

Food items	Correlation Coefficient (r)				
	Family size	Family income	Number of members employed in a family	Age of the fisherwomen	Fisherwomen's income
Pulses	0.0138	-0.1314	-0.0698	-0.0105	-0.0414
Green leafy vegetables	-0.0972	-0.2245*	-0.1406	-0.0995	-0.1923
Other vegetables	-0.1124	-0.3266**	-0.1944	-0.0342	-0.1801
Roots and tubers	-0.1173	-0.1073	-0.0966	-0.0687	-0.0057
Fruits	0.1466	-0.0998	0.0206	0.1061	-0.1407
Nuts and oil seeds	0.0690	-0.1093	-0.0382	0.0403	-0.0624
Milk	-0.0117	-0.2935**	-0.0858	0.0368	-0.1954*
Milk Products	-0.1049	-0.1594	-0.0489	-0.0908	-0.0514
Fats and oils	0.0406	0.0202	0.0311	0.0222	0.0174
Egg	0.0320	-0.1340	-0.0387	0.1072	-0.1088
Meat	0.0009	-0.1896	-0.1604	-0.0183	-0.1331
Commercially prepared foods	-0.0601	-0.0655	-0.0635	-0.0492	-0.0527

* Significant at 5 per cent level
** Significant at 1 per cent level.

Table 18 Daily food consumption pattern of the fishermen families

Type of food	No. of families			
	Early morning	Breakfast	Lunch	Dinner
Black coffee	141 (94.00)	–	–	–
Yesterday's left over food	–	23(15.33)	–	–
Cereals, Cereals & dhals coconut preparations with coffee or tea	–	88(58.67)	–	–
Wheat preparations with coffee or tea	–	5 (3.33)	–	–
Rice, fish, coconut	–	–	121 (80.67)	120 (80.00)
Rice, tapicoa, fish, coconut	–	–	12 (8.00)	11 (7.33)
Rice, fish, Vegetables, coconut	–	–	17 (11.33)	19 (12.67)
Not taking any food	9(6.00)	34(22.67)	–	–
Total	150(100)	150(100)	150(100)	150(100)

Numbers in parenthesis indicate percentage of families

morning (94.00 per cent). The major item for breakfast was left over rice of previous night kept in water (15.33 per cent) while 58.67 per cent consumed either preparations made from cereals or cereals with dhal, along with a coconut based side dish. Coffee or tea was also consumed with breakfast. Wheat preparations (puttu or dosa) were also found included in the meal pattern of the 3.33 per cent of the families. Rest of the families (22.67 per cent) did not consume breakfast.

Rice with fish curry (fish + coconut) was the common menu for lunch and dinner of 80.00 per cent of the families. Along with this, tapioca was also included in the lunch and dinner by 8.00 per cent of the families. Instead of roots and tubers, other vegetables were included in the lunch by 11.33 per cent and in the dinner by 12.67 per cent of the families surveyed.

The family survey revealed that there was no special consideration for male or female members in serving special foods like egg, meat, fish and milk. All the families took meals according to the convenience of the members.

The families surveyed, generally celebrated occasions like anniversaries, birth days, marriages and religious festivals by preparing special delicious foods like sweet dishes or snacks or combinations of the two.

Table 19 shows the special foods given during pregnancy,lactation, infancy, pre-school and adolescent periods.

Table 19 Special foods given during special conditions

Type of food	Special conditions				
	Pregnancy	Lactation	Infancy	Pre-school	Adolescent
Milk	-	-	126 (84.00)	84 (56.00)	-
Supplementary foods	-	-	5 (3.33)	29 (19.33)	-
Milk and supplementary foods	-	-	-	22 (14.67)	-
Milk and commercially prepared baby foods	-	-	17 (11.34)	-	-
No special foods	150 (100)	150 (100)	2 (1.33)	15 (10.00)	150 (100)
Total	150(100)	150(100)	150(100)	150(100)	150(100)

Numbers in parenthesis indicate percentage of families

Majority of the families supplemented breast milk with cow's milk (84.00 per cent), while 3.30 per cent used special supplementary foods and 11.33 per cent milk and commercially prepared baby foods. Only 1.33 per cent of the families did not give any special foods to their children along with breast milk in their infancy period.

No special items or foods were prepared at home for pregnant and nursing mothers. Adolescent children were also given only the ordinary adult diet.

Details related to the diet restrictions followed while feeding members during illness are given in Table 20. solid food was restricted during fever (57.33 per cent), diarrhoea (74.67 per cent), and asthma (18.67 per cent).

Table 20 Food restrictions for sick persons by the fishermen families.

Type of food	Fever	Common cold	Diarrhoea	Asthma
Solid foods	86 (57.33)	-	112 (74.67)	28 (18.67)
No restrictions	64 (42.67)	150 (100)	38 (25.33)	122 (81.33)
Total	150 (100)	150 (100)	150 (100)	150 (100)

Numbers in parenthesis indicate percentage of families.

Table 21 depicts the common cooking methods practised by the families. It is indicated that boiling was the commonly

Table 21 Cooking methods practised by fishermen families

Cooking methods	No.of families adopting different methods							
	Cereals	Pulses	Green leafy vegetables	Other vegetables	Roots and tubers	Flesh foods	Egg	Milk
Boiling	–	150 (100)	142 (94.67)	150 (100)	150 (100)	134 (89.33)	150 (100)	150 (100)
Boiling and straining	150 (150)	–	–	–	–	–	–	–
Shallow frying	–	–	8 (5.33)	–	–	–	–	–
Boiling and shallow frying	–	–	–	–	–	16 (10.67)	–	–
Total	150 (100)	150 (100)	150 (100)	150 (100)	150 (100)	150 (100)	150 (100)	150 (100)

Numbers in parenthesis indicate percentage of families

adopted method by all the families for cooking egg, milk, pulses, other vegetables and roots and tubers. Boiling was commonly practised by 94.67 per cent of the families for cooking leafy vegetables. In the case of flesh foods, 89.33 per cent of the families adopted only boiling while 10.67 per cent of the families adopted boiling and shallow fat frying methods. In most of the families excess water method of boiling was used for cooking rice and the excess water, decanted was reused either for drinking as such, or for cooking other food items.

Majority of the families used mud and aluminium vessels (73.33 per cent) for cooking. Only very few others used either mud (10.00 per cent) or aluminium (16.67 per cent) alone for cooking.

Fire wood was the most commonly used fuel (84.00 per cent). The remaining families (16.00 per cent) used kerosene along with firewood for the purpose of cooking food.

4.2.7 Developing an index based on selected socio-economic variables

From among the various socio-economic characteristics of the families of the fisherwomen collected, few indicators like caste, educational status of the fisherwomen, occupation, total monthly income of the household, per capita monthly income, monthly expenditure on food, monthly expenditure on clothing, type of housing, calorie requirement of the fisherwomen and

protein requirement of the fisherwomen were selected for developing an index to ascertain quality of life of these families. Each parameter was rated by giving "scores". Scores obtained for each parameter was summed up to obtain total score for each family. Maximum score that can be obtained by this calculation is 53.

In the families surveyed, maximum score obtained was 30 and minimum was 9. Scores obtained for each family is presented in Appendix VIII.

Dhanasekaran (1991) has evolved an index to ascertain poverty levels based on the quality of life of rural areas in Tamil Nadu. Based on the classification by Dhanasekaran (1991) the scores obtained by the families in the present study were divided into 4 groups as destitutes, very very poor, very poor and poor and the details are furnished in Table 22. The distribution of the families with respect to various levels of poverty shows that 14.67 per cent of the fishermen families were classified as very very poor, 82.00 per cent as very poor and 3.33 per cent as poor. Thus all the families surveyed were poverty stricken.

From the data the mean score for the very very poor families was 12.27 with a SD of 1.86, 19.03 with a SD of 2.54 for very poor and 27.20 with a SD of 1.79 for the poor. All these mean scores came within the range of Dhanasekaran's classification. The CV values show that the variability in the score of life index is less among the poor.

Table 22 Poverty level based on the quality of life index

Levels of poverty*	Score range	No.of families(%)	Mean	SD	CV(%)
Destitutes	Below 4	-	-	-	-
Very very poor	4-14	22 (14.67)	12.27	1.86	15
Very poor	15-25	123(82.00)	19.03	2.54	13
Poor	26-39	5(3.33)	27.20	1.79	7
Total		150(100)	19.50	4.03	20.67

Source: Dhanasekaran (1991)*

4.3 Time utilization pattern of the women engaged in fishvending

The study envisages an assessment of the nutritional status of the women engaged in fishvending in the 150 families. A major determinant influencing their nutritional status is the time allocated for various domestic and outside activities. Personal characteristics such as age, educational level and marital status may also have a bearing on their nutritional status. Hence information related to these factors was collected.

4.3.1 Personal characteristics of the women engaged in fishvending

The Present study has helped to identify several variables related to the socio-economic status, dietary habits and occupational details of the women engaged in fishvending. Table 23 presents age, educational level and marital status of the women surveyed.

As revealed by the data, it is evident that all the women surveyed were middle aged, moderately educated and were leading a regular family life except for 6.67 per cent who were widowed/divorced.

Early marriage between 15 and 17 years was common among 32.7 per cent of the families. Dowry system was found to be common in this community and cash, ornaments, land and fishing equipment alone or in combinations were offered by parents as

Table 23 Personal characteristics of the fisherwomen

Age (years)	Educational level						Marital status			
	Illiterate	Dropouts	Primary	Secondary	Highschool	Total	Married	Divorced	Widows	Total
≤ 30	9 (6.00)	4 (2.67)	13 (8.67)	11 (7.33)	5 (3.33)	42 (28.00)	41 (27.33)	-	1 (0.67)	42 (28.00)
31-40	20 (13.33)	6 (4.00)	24 (16.00)	10 (6.67)	4 (2.67)	64 (42.67)	59 (39.34)	1 (0.67)	4 (2.66)	64 (42.67)
41-50	15 (10.00)	2 (1.33)	16 (10.66)	10 (6.67)	1 (0.67)	44 (29.33)	40 (26.67)	1 (0.67)	3 (2.00)	44 (29.33)
Total	44 (29.33)	12 (8.00)	53 (35.33)	31 (20.67)	10 (6.67)	150 (100)	140 (93.34)	2 (1.34)	8 (5.33)	150 (100)

Numbers in parenthesis indicate percentage of fisherwomen

financial security for the families during marriage. At the same time it is encouraging to note that 36.00 per cent of the fisherwomen surveyed did not get any such financial support from their families during marriage.

4.3.2 Responsibilities of the women engaged in fishvending

Women engaged in fishvending were responsible for dual work as housewife and as wage earner of the family. Time spent by these women for household and fishvending activities is presented in Table 24 and the details are presented in Appendix X. Compared to the work outside home, the women were found to spend less time for household work. An assessment of the total time spent for these two activities revealed that the majority of women were working for more than 10 hours a day.

Due to lack of time for doing various domestic work these women seemed to combine the two fields of activities. It is seen that purchasing of raw food materials, fire wood, kerosene, materials needed for children or the combination of the above were some of the domestic responsibilities done along with fishvending by all the women surveyed (Table 25).

Fish was rarely available during the off season (Season of heavy rain and storm) and it was costly also. Money management at the household level during the off season is presented in Table 26. They purchased fish at a very high price or they bought dried fish from the local contractors for fishvending (80.00 per

Table 24 Distribution of fisherwomen based on the time spent for household and fishvending activities

Time (Hour)	Details of fisherwomen		
	Household activities	Fishvending activities	Both activites
≤ 1	1 (0.67)	–	–
2	26 (17.33)	–	–
3	57 (38.00)	–	–
4	23 (15.33)	–	–
5	43 (28.67)	6 (4.00)	–
6	–	11 (7.33)	1 (0.67)
7	–	19 (12.67)	–
8	–	20 (13.33)	2 (1.33)
9	–	34 (22.67)	10 (6.67)
10	–	23 (15.33)	20 (13.33)
11	–	8 (5.33)	34 (22.67)
12	–	13 (8.67)	32 (21.33)
13	–	7 (4.67)	7 (4.67)
14	–	9 (6.00)	44 (29.33)
Total	150 (100)	150 (100)	150 (100)

Numbers in parenthesis indicate percentage of fisherwomen

Table 25 Domestic work done along with fishvending

Domestic work	Details of fisherwomen	
	No.	Per cent
Purchasing raw food materials	91	60.67
Purchasing household accessories, fire wood and kerosene	30	20.00
Purchasing materials needed for children	5	3.33
Purchasing raw food materials, fire wood anbd kerosene	18	12.00
Purchasing raw food materials and materials needed for children	6	4.00
Total	150	100

cent). The remaining 20.00 per cent could not get any job during the off season. Naturally running the home would become tiresome affair for the women. Economic dependence during this period would be an additional burden to them. Of the 20.00 per cent, 4.66 per cent managed their homes with the income of other earning members of the families. But 15.34 per cent of the families did not have any income from any source, hence lived for atleast 5 months, on borrowed money.

Table 26 Money management during off season

Management practices	Details of fisherwomen	
	No.	Per cent
Income from fishvending	120	80.00
Income from other employed families members	7	4.66
No income and hence on debts	23	15.34
Total	150	100

Besides the off season, fishvending activities of the women varied during certain physiological conditions like pregnancy and lactation. Except few women (18.00 per cent) other women were going for fishvending activities upto 7 to 9 months of pregnancy. Similarly after delivery also, 76.00 per cent went for fishvending work after three months.

During the above physiological stress periods and also during normal days, management of children was a major problem

faced by these women. The children were looked after by other dependent adult members of the family (91.34 per cent) or by the elder children (5.33 percent) or by the husbands (3.33 percent).

4.3.3 Relationship between selected socio-economic variables and time utilization pattern of the fisherwomen

Women engaged in fishvending activities were in general very busy with their domestic chores. However, certain socio-economic variables such as family size, family income, fisherwomen's income and their age were found to influence the work and time allocation pattern for the major activities.

Time spent for different activities according to the family size by the fisherwomen are presented in Table 27. No variation in time spent for household activities by smaller and larger families was observed. In smaller families with 1-5 members, they spent 32.92 per cent time for fishvending and in larger families with above five members they spent 35.21 per cent of their time, for the same activity. For leisure activities and sleep 52.99 and 50.70 per cent of their time were spent by the former and the latter groups respectively.

Table 28 reveals the time spent for different activities according to the family income by the fisherwomen. Time spent for household activities gradually decreased as the income increased except in the highest income group and the percentage ranged from 12.50 to 18.19. When the income increased, the time

Table 27 Mean time spent for different activities according to family size by the fisherwomen

Family size	Details of fisherwomen	Activities*			
		Household	Fishvending	Leisure and sleep	Total
1 - 5	108 (72.00)	3,23 (14.09)	7,54 (32.92)	12,43 (52.99)	24,00 (100)
Above 5	42 (28.00)	3,23 (14.09)	8,27 (35.21)	12,10 (50.70)	24,00 (100)
Total	150(100)				

Numbers in parenthesis indicate percentage of time.

* Activities are expressed in hours and minutes

Table 28 Mean time spent for different activities according to family income by the fisherwomen

Family income	Details of Fisherwomen	Activities*			
		Household	Fishvending	Leisure and sleep	Total
≤ 1000	9 (6.00)	4,22 (18.19)	7,30 (31.25)	12,08 (50.56)	24,00 (100)
1001 - 2000	106 (70.67)	3,30 (14.58)	7,48 (32.50)	12,42 (52.92)	24,00 (100)
2001 - 3000	27 (18.00)	3,00 (12.50)	9,32 (39.72)	11,28 (47.78)	24,00 (100)
> 3000	8 (5.33)	3,05 (12.85)	9,55 (41.32)	11,00 (45.83)	24,00 (100)
Total	150 (100)				

Numbers in parenthesis indicate percentage of time.

*Activities are expressed in hours and minutes

spent for fishvending activities also increased and it ranged from 31.25 to 41.32 per cent of the time. Time spent for leisure activities and sleep was found to be decreasing as the income increased, except in the income range of Rs.1001-2000.

Table 29 describes the mean time spent for different activities and the number of members employed in a family. Percentage of time spent for household activities slightly decreased from 12.22 to 11.60 as the number of employed persons increased. But for fishvending activities the percentage of time spent was more, viz., 38.54, in families where one person alone was employed, when compared to 2 and 3 employed persons in a family. Time spent for leisure activities and sleep was found to be increasing as the employed persons increased.

Time spent for different activities according to the fisherwomen's age is shown in Table 30. Time spent for household activities and fishvending activities was steadily increasing with the increase in age. But the leisure activities and sleep, decreased with the increase in age.

Time spent for different activities according to the fisherwomen's income is given in Table 31. There was a gradual reduction of time spent for household activities with increase in income of the fisherwomen except in the case of women having an income of Rs. 501-1000. Similarly time spent for fishvending activities increased with increase in income. However the time

Table 29 Mean time spent for different activities by the fisherwomen according to the number of employd family members

No. of members employed in a family	Details of fisherwomen	Times spent for activities*			
		Household	Fishvending	Leisure and sleep	Total
1	10 (6.67)	2,56 (12.22)	9,15 (38.54)	11,49 (49.24)	24,00 (100)
2	110 (73.33)	2,50 (11.81)	8,52 (36.94)	12,18 (51.25)	24,00 (100)
≥ 3	30 (20.00)	2,47 (11.60)	8,38 (35.97)	12,35 (52.43)	24,00 (100)
Total	150 (100)				

Numbers in parenthesis indicate percentage of time

* Activities are expressed in hours and minutes

Table 30 Mean time spent for different activities according to the fisherwomen's age

Age of the fisherwomen (Years)	Details of fisherwomen	Time spent for activities*			
		Household	Fishvending	Leisure and sleep	Total
≤ 30	42 (28.00)	3,15 (13.54)	7,35 (31.60)	13,10 (54.86)	24,00 (100)
31 - 40	64 (42.67)	3,22 (14.03)	9,28 (39.44)	11,10 (46.53)	24,00 (100)
41- 50	44 (29.33)	4,17 (17.85)	8,10 (34.03)	11,33 (48.12)	24,00 (100)
Total	150 (100)				

numbers in parenthesis indicate percentage of time

*Activities are expressed in hours and minutes.

Table 31 Mean time spent for different activities according to the fisherwomen's income

fisherwomen's income (Rs)	Details of fisherwomen	Time spent for activities *			
		Household	Fishvending	Leisure and sleep	Total
≤ 500	23 (15.33)	3,36 (15.00)	7,33 (31.46)	12,51 (53.54)	24,00 (100)
501 -1000	82 (54.67)	3,39 (15.21)	7,36 (31.67)	12,45 (53.12)	24,00 (100)
> 1000	45 (30.00)	3,31 (14.65)	9,10 (38.19)	11,19 (47.16)	24,00 (100)
Total	150 (100)				

Numbers in parenthesis indicate percentage of time

*Activities are expressed in hours and minutes

spent for leisure activities and sleep was found to decrease as the income of the fisherwomen increased.

Influence of selected parameters on the time expenditure pattern of the fisherwomen is given in Table 32. There was no significant relationship between the selected variables such as family size, family income, number of members employed in a family, age of the fisherwomen and fisherwomen's income and the time spent for household activities. Time spent for fishvending activities is associated with the family income, age of the fisherwomen (5 per cent level) and fisherwomen's income (1 per cent level). While negative correlation was observed in all the variables and leisure activities and sleep except in the number of members employed in a family.

4.3.4 Salient features of the fishvending activities of the fisherwomen

Among the various types of chores in which these women were engaged, more importance seems to be given for fishvending activities. Income of these women was also mainly from this source. On the basis of the daily income of the fisherwomen, distance covered, mode of transport and time spent for fishvending were ascertained and details are presented in Table 33. As revealed, the women were trecking long distances of 7 kms to 11 kms daily to complete their work. Many women (68 per cent) were utilizing vehicle facilities for this purpose.

Table 32 Influence of selected paremeters on the time expenditure pattern of the fisherwomen

Selected variables	Correlation Coefficient (r)		
	Household activities	Fishvending	Leisure activities and sleep
Family size	0.0031	0.1425	-0.1446
Family income	-0.0982	0.3359**	-0.2551**
Number of members employed in a family	0.0370	-0.0681	0.0529
Age of the fisherwomen	0.0885	0.1492**	-0.2167**
Fisherwomen's income	0.1242	0.4678**	-0.3834**

* Significant at 5 per cent level
** Significant at 1 per cent level

Table 33 Details of fishvending activities by the fisherwomen in a day

Daily income from fish vending (Rs.)	Distance covered (KM)				Mode of transport		
	7-9	9-11	Above 11	Total	Walking	using Vehicle	Total
≤ 25	3 (2.00)	4 (2.67)	64 (42.66)	71 (47.33)	32 (21.33)	39 (26.00)	71 (47.33)
26-50	1 (0.67)	-	57 (38.00)	58 (38.67)	13 (8.67)	45 (30.00)	58 (38.67)
51-75	-	-	7 (4.67)	7 (4.67)	2 (1.33)	5 (3.34)	7 (4.67)
76-100	-	-	12 (8.00)	12 (8.00)	1 (0.67)	11 (7.33)	12 (8.00)
101-150	-	-	2 (1.33)	2 (1.33)	-	2 (1.33)	2 (1.33)
Total	4 (2.67)	4 (2.67)	142 (94.66)	150 (100)	48 (32.00)	102 (68.00)	150 (100)

Numbers in parenthesis indicate percentage of fisherwomen.

Details related to fish marketing and amount spent for buying fish for fishvending are depicted in Table 34. It was observed that many of the fisherwomen (46.67 per cent) spent an amount of Rs. 101-200 for buying fish for the purpose of fishvending while 37.33 per cent were found to spend $\leq$ Rs.100. However it was also noted that few women (22.00 per cent) spent more than Rs. 200 daily for buying fish. Fisherwomen sold their fish in the nearest market or to the residents in the neighbourhood or in a market or carried to the houses in the city situated far away from their homes.

4.3.5 Relationship between the fishvending activities of the fisherwomen and selected socio-economic variables

The amount spent for buying fish for fishvending was found to be influenced by certain socio-economic variables like family size, family income, number of members employed in a family, fisherwomen's age and fisherwomen's income. Frequency distribution of fisherwomen according to family size and amount spent for buying fish are given in Table 35. It revealed that in smaller families many of the fisherwomen (50.93 per cent) spent Rs. 101-200 and in the larger families it was 35.71 per cent. More than Rs. 200 was spent by 14.81 per cent of the smaller families and by 40.81 per cent of the larger families. And it was observed that there was a significant positive correlation at 5 per cent level ($r=0.1972^{*}$) between family size and amount spent for buying fish.

Table 34 Details of fish marketing and the amount spent for buying fish daily by the fisherwomen.

Marketing place	Amount spent for buying fish (Rs)			Total
	≤ 100	101-200	>201	
Nearest market	1 (0.67)	-	1 (0.67)	2 (1.33)
Market faraway from the house	27 (18.00)	48 (32.00)	27 (18.00)	102 (68.00)
Home to home in city situated far away from their houses	19 (12.66)	22 (14.67)	5 (3.33)	46 (30.67)
Total	47 (37.330	70 (46.67)	33 (22.00)	150 (100)

Numbers in parenthesis indicate percentage of fisherwomen

Table 35 Frequency distribution of the fisherwomen according to family size and amount spent for buying fish

Family size \	Amount spent for buying fish (Rs.)			Total
	≤ 100	101-200	> 200	
1 - 5	37 (34.26)	55 (50.93)	16 (14.81)	108 (100)
Above 5	10 (23.81)	15 (35.71)	17 (40.48)	42 (100)
Total	47 (31.33)	70 (46.67)	33 (22.00)	150 (100)

Numbers in parenthesis indicate percentage of fisherwomen

A relationship was observed in the study between the total income of the family and the amount spent for buying fish daily. Frequency distribution of the fisherwomen according to the family income and the amount spent for buying fish is presented in Table 36. Of the fisherwomen studied,46.67 per cent spent Rs. 101-200 for buying fish and were in the different income groups of ≤Rs.1000 to >3000. In the lower income group of ≤Rs.1000,55.56 per cent of the women spent less than or equal to Rs.100 for buying fish. And in the next group of Rs. 1001-2000, many of the women (52.83 per cent) spent Rs.101-200. Fisherwomen in the income group of Rs.2001-3000 and above Rs.3000, spent more than Rs.300 and their per cent was 55.55 and 50.00. From the statistical analysis of the data for correlation, a highly significant relationship was observed at 1 per cent level ($r=0.6702^{**}$) between family income and amount spent for buying fish.

Table 37 shows the frequency distribution of the fisherwomen according to the number of members employed in the family and the amount spent for buying fish. It revealed that many of the fisherwomen spent Rs. 101-200 daily for fishvending. Only in the case of fisherwomen who spent above Rs.200 for fishvending, the amount spent was inversely proportional to the number of members employed in a family. When statistically tested there was no significant association (r=0.0244) between the number of family members employed and the amount spent for buying fish.

Table 36 Frequency distribution of the fisherwomen according to family income and amount spent for buying fish.

Family income	Amount spent for buying fish (Rs.)			Total
	≤ 100	101–200	> 200	
≤ 200	5 (55.56)	4 (44.44)	–	9 (100)
1001 – 2000	36 (33.96)	56 (52.83)	14 (13.21)	106 (100)
2001 – 3000	5 (18.52)	7 (25.93)	15 (55.55)	27 (100)
> 3000	1 (12.50)	3 (37.50)	4 (50.00)	8 (100)
Total	47 (31.33)	70 (46.67)	33 (22.00)	150 (100)

Numbers in parenthesis indicate percentage of fisherwomen

Table 37 Frequency distribution of the fisherwomen according to number of members employed in a family and amount spent for buying fish

Number of members employed in a family.	Amount spent for buying fish (Rs.)			Total
	≤ 100	101-200	> 200	
1	2 (20.00)	5 (50.00)	3 (30.00)	10 (100)
2	39 (35.45)	47 (42.73)	24 (21.82)	110 (100)
≥3	6 (20.00)	18 (60.00)	6 (20.00)	30 (100)
Total	47 (31.33)	70 (46.67)	33 (22.00)	150 (100)

Numbers in parenthesis indicate percentage of fisherwomen

Frequency distribution of the fisherwomen according to their age and amount spent for buying fish is given in Table 38. Age of the fisherwomen was found to have a direct influence on the amount spent for buying fish daily, in the two groups where the maximum amount spent for buying fish daily was ≤Rs.200. Statistical analysis of the data revealed that there was no significant relationship between the age of the fisherwomen and the amount spent for buying fish.

Table 39 describes the frequency distribution of fisherwomen according to their income and amount spent for buying fish. Correlation study of the data showed that fisherwomen's income was highly associated with the amount spent for buying fish ($r=0.8230^{**}$).

4.4 Energy expenditure pattern of the fisherwomen

Energy expenditure by an individual will be influenced by the type of activity and time spent for each activity. Since energy expenditure of the women will influence their nutritional status, details pertaining to the energy expended for different activities in a day were ascertained.

4.4.1 Total energy expenditure of the fisherwomen

Total energy expenditure of the fisherwomen for a day for fulfilling all their duties was calculated and is given in Table 40. Details pertaining to the total energy expended are presented

Table 38 Frequency distribution of the fisherwomen according to their age and amount spent for buying fish

Age (year)	Amount spent for buying fish (Rs.)			Total
	≤ 100	101-200	> 200	
≤ 30	14 (33.33)	23 (54.76)	5 (11.91)	42 (100)
31 - 40	20 (31.25)	29 (45.31)	15 (23.44)	64 (100)
41 - 50	13 (29.55)	18 (40.91)	13 (29.54)	44 (100)
Total	47 (31.33)	70 (46.67)	33 (22.00)	150 (100)

Numbers in parenthesis indicate percentage of fisherwomen

Table 39 Frequency distribution of the fisherwomen according to their income and amount spent for buying fish.

fisherwomen's income (Rs.)	Amount spent for buying fish (Rs.)			Total
	≤ 100	101-200	> 200	
≤ 500	18 (78.26)	5 (21.74)	-	23 (100)
501 - 1000	28 (34.15)	46 (56.09)	8 (09.76)	82 (100)
> 1000	1 (02.22)	19 (42.22)	25 (55.56)	45 (100)
Total	47 (31.33)	70 (46.67)	33 (22.00)	150 (100)

Numbers in parenthesis indicate percentage of fisherwomen

in Appendix X. It was observed that 32.00 per cent spent less than 2300 Kilocalories per day for their daily activities and 26.67 per cent of the women spent 2301 to 2400 Kilocalories per day. Highest enegry expenditure which was greater than 2700 Kilocalories was observed only among 3.33 per cent of the women.

Table 40 Distribution of the fisherwomen according to their daily energy expenditure pattern.

Energy expenditure (Kcals)	Details of fisherwomen	
	No.	Percent
2200 -2300	48	32.00
2301-2400	40	26.67
2401-2500	27	18.00
2501-2600	15	10.00
2601-2700	15	10.00
>2700	5	3.00
Total	150	100

4.4.2 Energy expenditure for different activities of the fisherwomen

Energy expenditure was calculated by prediction equation into BMR factor for different activities based on their time expenditure pattern (ICMR,1990).

Energy expenditure for different activities was observed and the distribution of the women according to the energy expenditure are presented in Table 41. About 47.33 per cent of the women spent less than 250 Kilocalories for their household activities and highest energy expenditure of 1001 to 1250

Table 41 Distribution of the fisherwomen according to the energy spent for different activities.

Energy spent (Kcals)	Household activities	Fishevending activities	Leisure time activities
≤250	71 (47.33)	-	102 (68.00)
251-500	47 (31.34)	-	48 (32.00)
501-750	25 (16.67)	23 (15.33)	-
751-1000	5 (3.33)	51 (34.00)	-
1001-1250	2 (1.33)	47 (31.34)	-
>1250	-	29 (19.33)	-
Total	150 (100)	150 (100)	150 (100)

Kilocalories was observed among 1.33 per cent of the women for this purpose.

Energy expenditure for fishvending activities revealed that 31.34 per cent of the fisherwomen spent 1000 to 1250 Kilocalories of energy daily for this work. But 19.33 per cent of the women were found to spend more energy for the same activity.

Fisherwomen spent less energy for leisure time activities ie., 68.00 per cent less than 250 kilocalories and 32.00 per cent spent 251 to 500 kilocalories.

4.4.3 Deviation from energy requirement and RDA of the fisherwomen

Energy requirement was calculated by prediction equation into BMR factor for 24 hours which is recommended by ICMR (1990). From energy expenditure and energy requirement energy deviation from requirement and RDA for moderate working women was calculated.

Energy deviation from energy requirement and RDA are presented in Table 42. It was found that all the women spent more energy then their requirement according to their body weight. Most of the women ie., 40.67 per cent spent 5.01 to 10.00 per cent more energy than their actual requirement and 1.33 per cent spent more than 25.00 per cent of their energy requirement.

Compared to the RDA for a moderate working woman 12.66 per cent spent less energy than the RDA. All others showed higher expenditure than their RDA. Most of the women (31.34 per cent) belonged to the energy deviation range of 10.01 to 15.00 per cent. Highest percentage of expenditure (>25.00 per cent) was observed only in 0.67 per cent of the fisherwomen.

4.5 Factors influencing the health parameters of the fisherwomen

Anthropometry deals with the comparative measurements of the body. This is one of the most frequently used methods for

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Table 42 Distribution of the fisherwomen on the basis of energy deviation from their actual requirement and Recommended Daily Allowances.

Energy deviation (%)	Details of fisherwomen	
	Deviation from energy requirement according to body weight	Deviation from RDA (for moderate working women)
≤ - 5	-	19(12.66)
≤ 5	39(26.00)	39(26.00)
5.01 - 10	61(40.67)	47(31.34)
10.01 - 15	22(14.66)	19(12.66)
15.01 - 20	16(10.67)	15(10.00)
20.01 - 25	10.(6.67)	10(6.67)
>25	2(1.33)	1(0.67)
Total	150(100)	150(100)

Numbers in parenthesis indicate percentage of fisherwomen

assessing nutritional status. Parameters like height and weight of the fisherwomen were measured and are presented in Table 43. The details are presented in Appendix XI. Mean height and weight of the fisherwomen were found to be below the ideal height (155 cm) and weight (50 kg) suggested for a reference woman (ICMR, 1989). The height of the women ranged between 137 and 163 cm and the mean height was found to be below the ideal height of 155cm.

Body Mass Index (BMI) of the fisherwomen according to ICMR classification was worked out and details are presented in Appendix XII. BMI according to ICMR classification is presented in Table 44 (Fig. 1). Two per cent of the fisherwomen suffered severe energy deficiency, while 24.00 per cent of the women were found to be healthy. But 31.33 per cent of the women were either in the group of Chronic Energy Deficiency (CED) I or II. In 42.67 per cent of the women, though classified as normal, were found to have lower body weight when compared to reference standards.

Correlation analysis of the data shows a highly significant association between BMI and body weight ($r=0.6211^{**}$) and height (0.3171^{**}).

Table 43 Mean height and weight of the fisherwomen compared to Indian standards for different age groups

Age (years)	Details of fisherwomen	Standard		Mean	
		Height (cm)	Weight (kg)	Height (cm)	Weight (kg)
		155.00	50.00		
≤ 30	42 (28.00)			152.79	44.56
31-40	64 (42.67)			152.48	43.53
41-50	44 (29.33)			152.04	44.66

Numbers in parenthesis indicate percentage of fisherwomen

Table 44 Body mass index (BMI) of the fisherwomen according to ICMR classification.

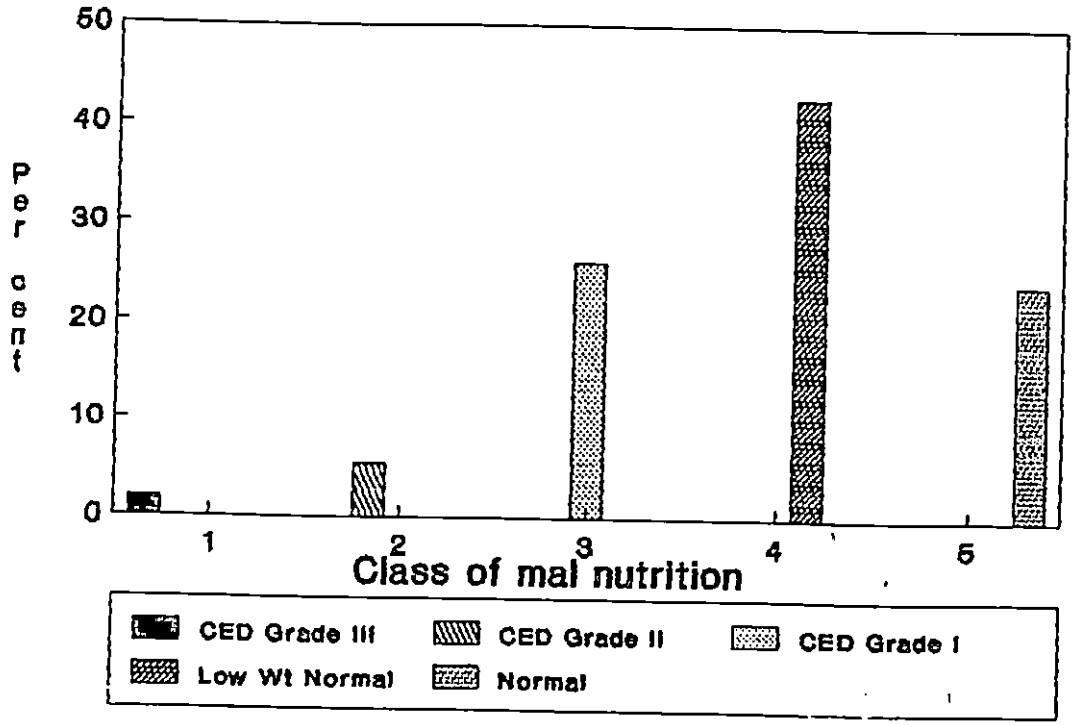
BMI class	Presumptive diagnosis	Details of fisherwomen
<16.0	CED Grade III (Severe)	3 (2.00)
16.0-17.0	CED Grade II (Moderate)	8 (5.33)
17.0-18.5	CED Grade I (Mild)	39 (26.00)
18.5-20.0	Low weight normal	64 (42.67)
20.0-25.0	Normal	36 (24.00)
Total		150 (100)

Numbers in parenthesis indicates percentage of fisherwomen

4.5.1 Nutritional status index

Nutritional status index of the fisherwomen was developed on the basis of height, weight and BMI and the results are furnished in Appendix XIII. Distribution of the women based on the nutritional status index are presented in Table 45. Nutritional status of the fisherwomen ranged from 14.04 to 18.58 with a mean of 16.25 and SE of 1.50. Based on this the respondents were classified as low, medium and high nutritional status. The women whose nutritional status was below mean -SE, between mean $\pm$SE and above mean +SE were respectively classified as low, medium and high. Lowest nutritional status was observed only in 9.33 per cent of the fisherwomen. The majority of

FIG 1 BODY MASS INDEX OF THE FISHERWOMEN



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fisherwomen (76.67 per cent) were in the medium level category and 14.00 per cent had higher level nutritional status. The distribution of the fisherwomen is found to follow the normal distribution.

Table 45 Nutritional status index of the fisherwomen

Nutritional status index	Details of fisherwomen	
	No	Per cent
Below 14.75	14	9.33
In between 14.75-17.75	115	76.67
Above 17.75	21	14.00
Total	150	100

Correlation studies of the data show that there was a highly significant association between nutritional status and height ($r=0.4821^{**}$), weight ($r=0.9370^{**}$), BMI ($r=0.9195^{**}$), quality life index ($r=0.3284^{**}$) and energy expenditure ($r=0.8964^{**}$).

Nutritional status and energy expenditure relationship were studied. The linear regression relation of energy expenditure (Y) on nutritional status index (X) was explained by $Y = 961.32 + 67.50 \times 1$ with a coefficient of determination of 80.00 per cent. This relationship was found to be significant as revealed by the F test of significance of regression (F=53.14). Based on the findings, 80.00 per cent of the variation in nutritional status may be attributed to the energy expenditure.

4.5.2 Relationship between nutritional status index and selected socio-economic variables

Correlation studies with the data on nutritional status index and selected socio-economic variables like family size, family income and number of members employed in the family. Age of the fisherwomen and fisherwomen's income were undertaken and it was found to have no significant relationship. The details are given in Table 46.

Table 46 Correlation (r) between nutritional status index and selected socio-economic variables

Selected variables	Correlation coefficient (r)
Family size	0.1267
Family income	0.0387
Number of members employed in a family	0.0259
Age of the fisherwomen	0.0789
Fisherwomen's income	0.0482

4.5.3 Clinical examination

Clinical examination was carried out to assess the prevalence of deficiency signs among the fisherwomen. Details are furnished in Table 47. The clinical signs of vitamin A deficiency were observed in 21.34 per cent of the women. Visible symptoms of vitamin B complex and vitamin C were also observed in 19.99 and 12.00 per cent of the women respectively.

Table 47 Nutritional deficiency symptoms of the fisherwomen

Nutrients responsible	Deficiency symptoms	Details of fisherwomen		
		No	Per cent	Total(%)
Vitamin A	Conjunctival xerosis	1	0.67	
	Bitots spot	2	1.33	
	cornial xerosis	1	0.67	
	Night blindness	18	12.00	
	photophobia	1	0.67	
	phrynoderma.	9	6.00	21.34
Vitamin B complex	Angular stomatitis	16	10.66	
	Glossitis	5	3.33	
	Maganta tongue	9	6.00	19.99
Vitamin C	Spongy bleeding gums	7	4.67	
	Palpitation and breathlessness	11	7.33	12.00
Iron	Anaemia	4	2.67	2.67
Flourine	mottled enamel	7	4.67	4.67
Calcium	Dental caries	25	16.66	16.66
Iodine	Enlargement of thyroid	2	1.33	1.33
Combinations of vitamins and minerals	Dental caries and mottled enamel	18	12.00	
	Night blindness and teeth caries	7	4.67	16.67
	No health problem	7	4.67	4.67
Total		150	100	100

Symptoms of deficiency of iron, fluorine, calcium and iodine were also prevalent among 25.53 per cent of the women examined. In addition to the above, combinations of vitamin and mineral deficiencies were noticed in 16.67 per cent of the women. But 4.67 per cent had no nutritional problem when subjected to clinical examination.

4.6 In depth studies on the nutritional status of selected fisherwomen (15)

Nutritional status of population is influenced profoundly by various socio-economic factors and food intake. Low socio-economic standards and poor food intake affect adversely the health status and physical efficiency of individuals. Hence an in depth study was conducted to measure the extent to which it influenced the nutritional status of women.

This study was conducted in a subsample of 15 fisherwomen which was randomly selected from the 150 fisherwomen. The study was carried out to assess their actual food and nutrient intake, energy consumption and expenditure pattern and their time utilization pattern for different activities.

4.6.1 Actual food and nutrient intake of fisherwomen

The actual food intake of 15 fisherwomen was determined by food weighment method to assess the quantity, quality and nutrients present in their diet. The food intake of the fisherwomen was recorded for three consecutive days and the details are presented in Appendix XIV. The quantity of each food item was compared with quantity specified in a balanced diet.

Table 48 revealed that the diet consumed by the fisherwomen was not balanced. The intake of cereals met 89 per cent of the Recommended Daily Allowance. The intake of pulses, green leafy vegetables, other vegetables, roots and tubers, fruits, fat and oils were very poor and the consumption rate was below 20.00 per cent of the RDA. Intake of protein foods ie., meat, fish and milk was very high. Meat and fish consumption was four times higher than the suggested level. Fish was the only easily available local protein foods for them. But egg was absent in their daily diets

The nutrients present in the food items were calculated using food composition tables (ICMR, 1989) and results are presented in Table 49 (Fig. 2). The details are furnished in Appendix XV. The intake of calories was below the RDA. Among

Table 48 Actual food intake of fisherwomen

Food groups	RDA	Mean food intake	Percentage of RDA met
Cereals	350	311.50	89.00
Pulses	55	4.33	7.87
Green leafy vegetables	50	2.78	5.56
Other vegetables	75	5.33	7.11
Roots and tubers	75	13.00	17.33
Milk and milk products	100	110.00	110.00
Fruits	30	3.33	11.10
Nuts and oil seeds	30	31.00	103.33
Fats and oils	25	4.33	17.32
Meat and fish	30	135.27	450.90
Egg	15	-	-
Sugar and jaggery	30	35.53	118.43

Table 49 Actual nutrient intake of fisherwomen

Nutrients	RDA	Mean nutrient intake	Percentage of RDA met from the diet
Energy (Kcal)	2225	1980.00	88.98
Protein (g)	50	58.12	116.24
Fat (g)	20	4.40	22.00
Calcium (mg)	400	296.00	74.00
Iron (mg)	30	18.00	60.00
Retinol (mg)	600	231.57	38.60
Thiamine (mg)	1.1	0.68	61.82
Niacin (mg)	14	9.78	69.85
Riboflavin (mg)	1.3	0.32	24.62
Vitamin c (mg)	40	21.28	53.20

other nutrients more than 60.00 per cent of calcium, iron, thiamine and niacin were met; while the intake of retinol, riboflavin and vitamin C was very poor and the percentage noted was 38.60, 24.62 and 53.20 respectively. Protein intake was higher than the prescribed RDA.

The association between the food intake and nutrient intake of the fisherwomen is presented in Table 50. A highly significant correlation was observed for the intake of other vegetables and milk and milk products with the intake of energy.

FIG 2 NUTRIENT INTAKE OF FISHERWOMEN
AS PERCENTAGE OF RDA

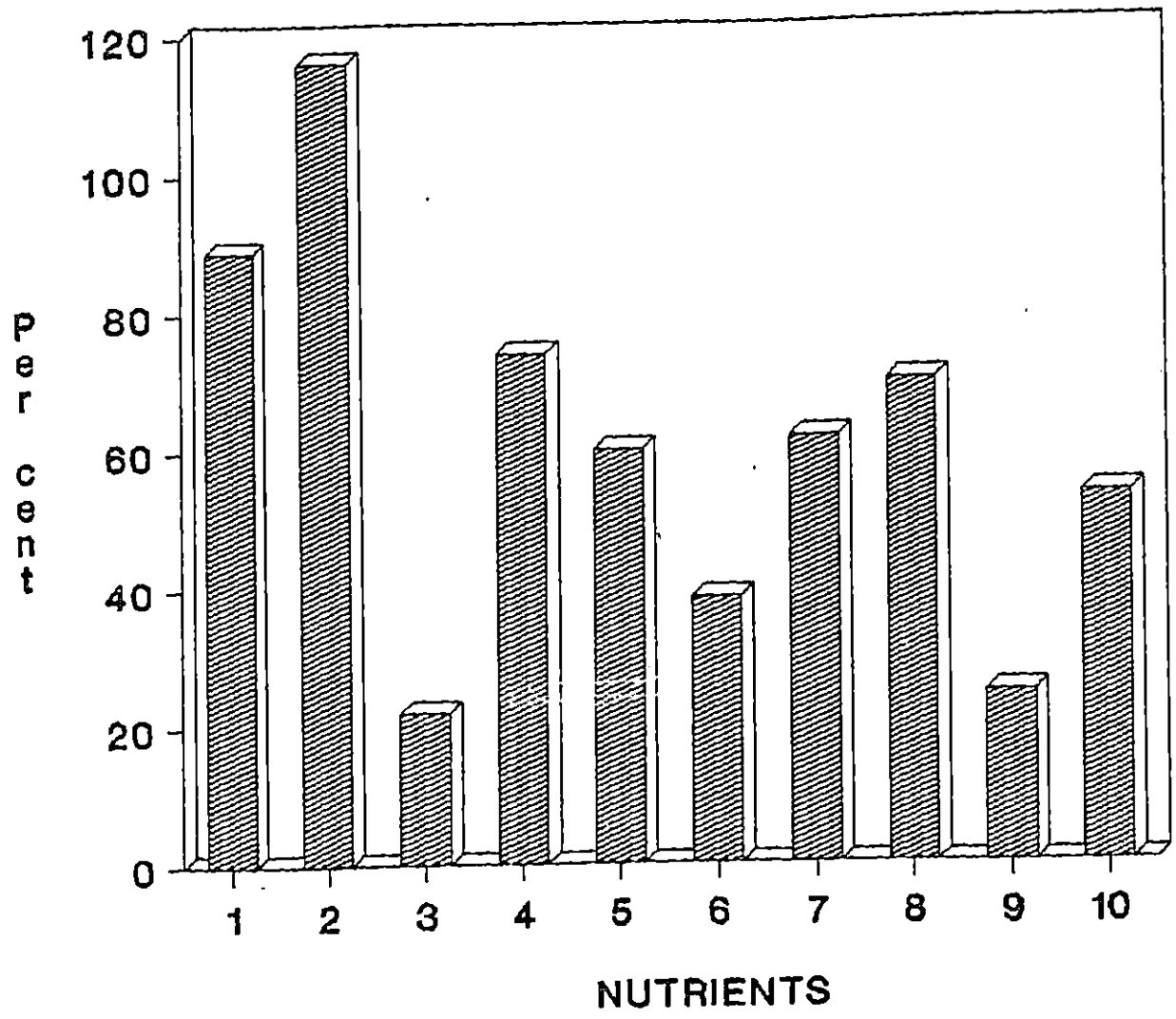

Table 50 Correlation between the food intake and nutrients obtained

Food group	Correlation coefficient (r)										
	Energy (Kcal)	Protein (g)	Fat (g)	Calcium (g)	Phosphorus (mg)	Iron (mg)	Retinol (mg)	Thiamine (mg)	Niacin (mg)	Riboflavin (mg)	Vitamin C (mg)
Cereals	0.1625	0.0878	-0.1364	-0.1659	-0.2851	-0.1737	-0.1601	-0.4159	-0.0812	-0.0410	0.2222
Pulses	0.1913	-0.1818	-0.2851	-0.4037	-0.0471	-0.3378	0.2522	0.0153	-0.1533	-0.2087	-0.0000
Green leafy vegetables	-0.1941	-0.2098	-0.1563	0.1877	0.1511	-0.2273	-0.1917	-0.2872	0.3760	0.2826	0.0350
Other vegetables	0.5840*	0.4698	0.6157**	-0.3429	-0.3553	-0.0488	0.1714	-0.2126	-0.0152	0.1411	0.5370*
Roots and tubers	0.1589	-0.3945	0.1671	-0.5526*	-0.3348	-0.1700	0.1583	-0.0552	0.1052	-0.3556	0.1715
Milk and milk products	0.5058*	0.0906	0.0272	0.0564	-0.0309	0.1661	-0.0032	-0.0849	0.1223	-0.2965	0.3113
Fruits	0.1854	-0.0372	-0.2389	0.0284	0.2727	-0.4759	0.2948	-0.2924	-0.2897	-0.5652*	0.1012
Nuts and oil seeds	-0.0708	0.5178*	0.0499	0.2697	0.1039	0.4384	-0.2913	-0.2803	0.2246	0.4878*	0.1391
Fats and oils	0.1991	-0.3389	0.1932	-0.4673	0.0696	-0.2280	0.7253**	0.0511	-0.3194	-0.3577	0.2157
Meat and fish	-0.1839	0.4009	0.1267	0.1367	0.2159	0.1390	-0.0413	-0.4654	0.0979	0.4761	0.3871
Sugar and jaggery	0.0238	-0.1114	0.1719	-0.5055*	0.0841	0.2518	0.3527	-0.3089	-0.6075**	0.0698	0.4216

* Singnificant at 5 per cent level.
** Significant at 1 per cent level.

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Association between the food intake and nutrient intake of the women were tested. Salient observations made in this context were significant positive correlation between protein and nuts and oil seeds fats and oils and retinol, other vegetables and vitamin C. Negative correlation was observed between roots and tubers and calcium, fruits and riboflavin and sugar with calcium and niacin.

4.6.2 Relationship between actual food intake and selected socio-economic variables

Table 51 reveals the relationship between the actual food intake and selected socio-economic variables. Family size shows significant positive relationship with roots and tubers and negatively with green leafy vegetables, nuts and oil seeds and flesh foods like meat and fish at 5 per cent level. Family income showed a negative association only with nuts and oil seeds. Positive relationship was also observed between the number of members employed in a family and the intake of roots and tubers at 1 per cent level and negatively correlated with the intake of green leafy vegetables and nuts and oil seeds at 5 per cent level. There was no relationship observed between the age of the fisherwomen or the fisherwomen's income and the intake of various foods.

Table 51 Relationship between actual food intake of the fisherwomen and selected socio-economic variables

Food items	Family size	Family income	Number of members employed in a family	Age of the fisherwomen	Fisherwomen's income
Cereals	0.1535	0.2426	0.2319	0.2499	-0.0027
Pulses	0.0190	-0.0395	-0.1242	0.3794	-0.1041
Green leafy vegetables	-0.5203*	-0.3499	-0.5666*	0.1231	0.1625
other vegetables	0.0739	-0.3481	0.1585	0.2819	-0.3598
Roots and tubers	0.5600*	0.1522	0.6941**	-0.4014	0.0220
Milk and milk products	0.2103	-0.0079	0.1989	0.0554	0.0376
Fruits	-0.2365	-0.0113	-0.1448	0.2809	-0.2877
Nuts and oil seeds	-0.4857*	-0.5045*	-0.5340*	0.4158	-0.0226
Fats and oils	0.4206	0.1925	0.4722	-0.4447	-0.0552
Meat and fish	0.4891*	-0.3281	-0.4491	0.0584	-0.1430
Sugar and jaggery	-0.3542	0.5134*	0.2495	0.1917	-0.0361

* Significant at 5per cent level
** Significant at 1per cent level

4.6.3 Time expenditure pattern of the fisherwomen

Daily activities of the fisherwomen and the time expenditure are given in Table 52 and in Appendix XVI. Besides fishvending, almost all the household chores were done by fisherwomen. The major works done by the fisherwomen were cooking, other household chores such as fetching water and household purchases etc. Average time spent for each activity was 2,16, 1,54, 1,02 and 0,41 hours respectively. Average time spent for fishvending activities was 9.30 hours daily.

4.6.4 Energy consumption and expenditure pattern of the fisherwomen

Energy consumption and expenditure pattern of the fisherwomen are presented in Table 53 and Figure.3. It was observed that the fisherwomen surveyed were in negative energy balance when compared to RDA. Deficiency of calories ranged from -6.60 to -14.65 per cent.

Energy expenditure of the fisherwomen was calculated by using prediction equation and Basal Metabolic Rate (BMR) factor for different activities based on age and weight. The energy expenditure of the fisherwomen revealed that all the women utilized more energy than they consumed and it ranged from 9.43 to 35.77 per cent.

Table 52 Distribution of the fisherwomen based on their daily activities

Activities	Time*											
	≤ 0,59	1-1,59	2-2,59	6-6,59	7-7,59	8-8,59	9-9,59	10-10,59	11-11,59	Minimum	Maximum	Mean
Personal care	9 (60.00)	6 (40.00)	-	-	-	-	-	-		0,25	1,15	0,50
Cooking	-	4 (26.67)	11 (73.33)	-	-	-	-	-		1,30	2,30	2,16
Other household activities	6 (40.00)	9 (60.00)	-	-	-	-	-	-		1,30	2,15	1,54
Fetching water	5 (33.33)	10 (66.670	-	-	-	-	-	-		0,45	1,20	1,02
Fishvending activities	-	-	-	-	2 (13.33)	5 (33.33)	3 (20.00)	3 (20.00)	2 (13.33)	7,20	11,25	9,30
Household purchase	10 (66.67)	5 (33.33)	-	-	-	-	-	-	-	0,30	1,15	0,41
Leisure activities	7 (46.67)	8 (53.33)	-	-	-	-	-	-	-	0,30	1,30	0,56
Sleep	-	-	-	6 (40.00)	7 (46.67)	2 (13.33)	-	-	-	6,20	8,15	7,14

Numbers in parenthesis indicate percentage of fisherwomen

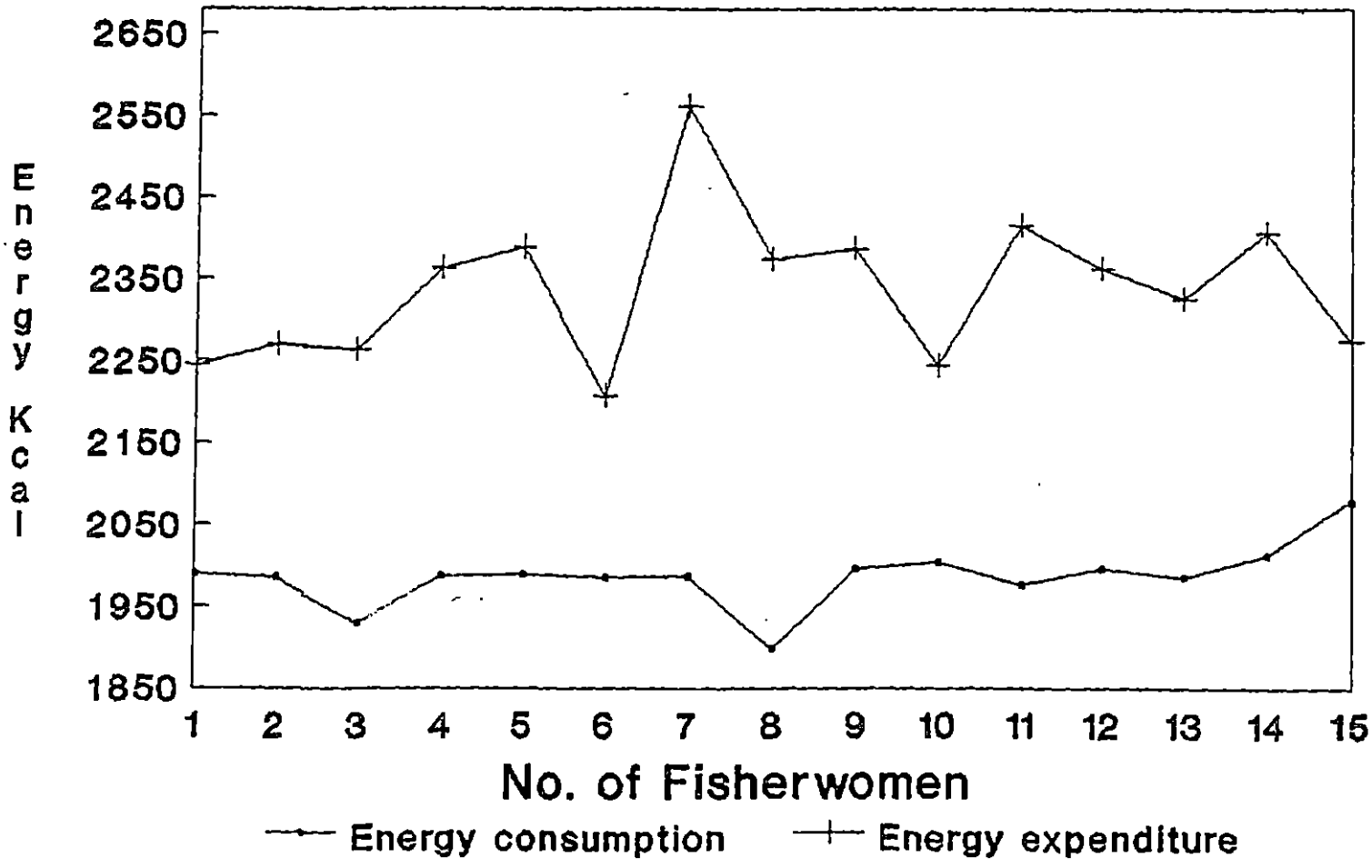
Time is expressed in hours and minutes

Table 53 Energy consumption and expenditure pattern of the fisherwomen

Age (Year)	Weight (kg)	RDA (Kcal)	Enegry consumed	Enegry difference from RDA (Kcal)	energy expenditure (Kcal)	Body stored energy utilized (Kcal)
36	41	2225	1990	-235 (-10.56)	2245	255 (12.81)
32	46		1985	-240 (-10.79)	2270	258 (14.36)
33	37		1929	-296 (-13.30)	2264	335 (17.37)
30	49		1987	-238 (-10.70)	2363	376 (18.92)
37	40		1989	-236 (-10.60)	2388	399 (20.06)
40	39		1985	-240 (-10.79)	2207	222 (11.18)
32	49		1887	-338 (-15.19)	2562	675 (35.77)
28	39		1899	-326 (-14.65)	2375	476 (25.07)
23	41		1996	-229 (-10.29)	2387	391 (19.59)
34	40		2004	-221 (-9.93)	2245	241 (12.03)
36	46		1976	-249 (-11.19)	2415	439 (22.21)
39	40		1996	-229 (-10.29)	2363	267 (18.39)
28	40		1985	-240 (-10.79)	2326	341 (17.17)
24	48		2012	-213 (-9.57)	2407	395 (19.63)
30	41		2078	-147 (-6.60)	2274	196 (9.43)

Numbers in parenthesis indicate percentage of fisherwomen

FIG 3 ENERGY CONSUMPTION AND EXPENDITURE OF THE FISHERWOMEN



An assessment of the mean energy consumption and expenditure and its percentage difference revealed that there was negative energy balance in the fisherwomen.

The correlation study between energy consumption and energy expenditure found that there was a highly significant difference ($r=0.8319^{**}$)

4.6.5 Fluctuations in energy expenditure of the fisherwomen

Through inventory, energy expended by the 15 women every hour was recorded for three days and the average energy expended by each woman was worked out. Average energy expended every two hours by each woman was recorded to identify the energy variation and the details are presented in Table 54.

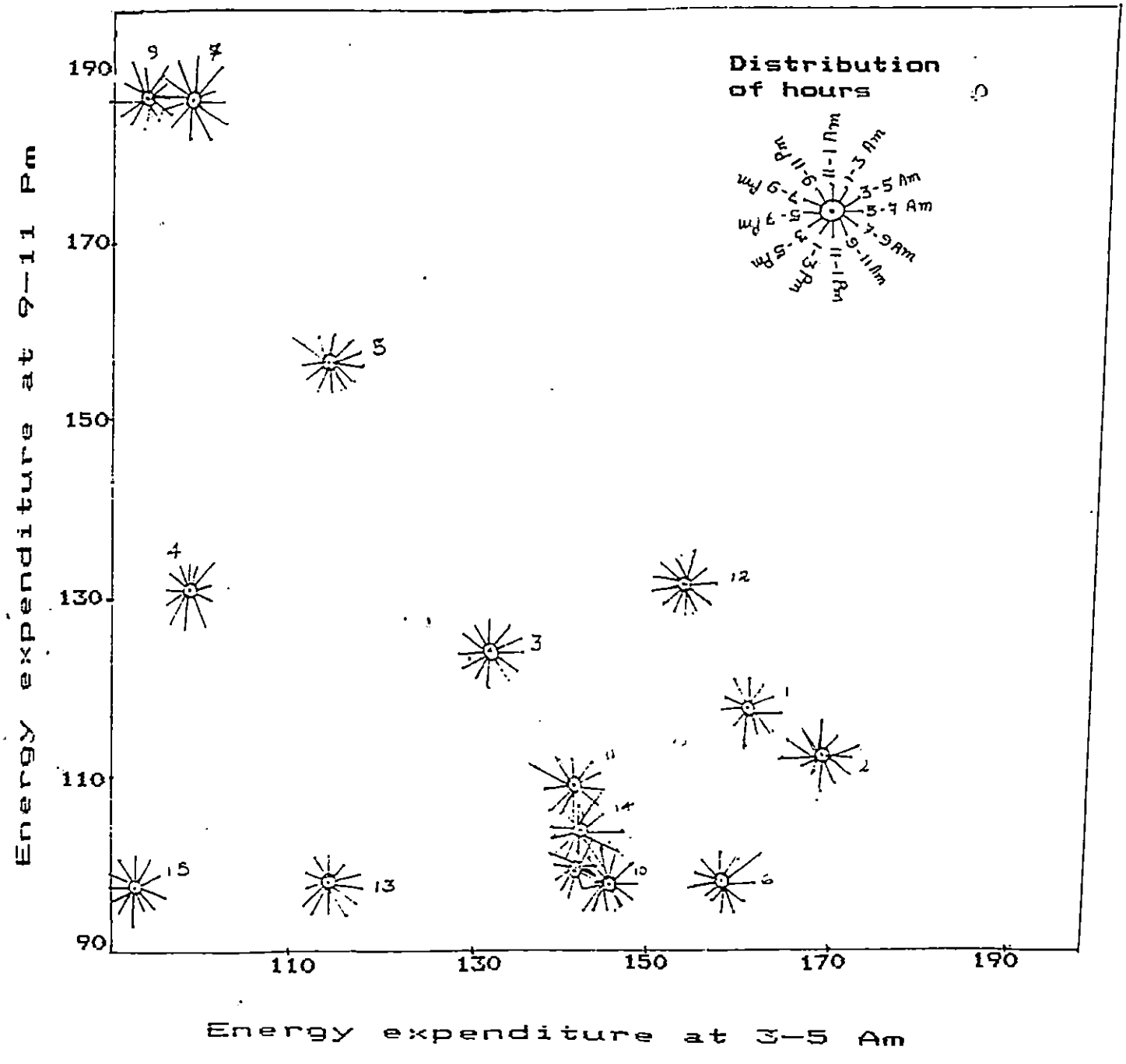
As revealed in the table, there was a wide variation in the energy expenditure pattern of the women ranging from 93.60 to 278.88 Kilocalories. In general more energy was expended by the women while engaged in fishvending activity.

From the above data 2 variables of energy expenditure from 3 to 5 am and 9 to 11 pm being high covariance were selected. With this data, a graph was drawn with energy expended from 3 to 5 am by the 15 women at X axis and energy expended from 9 to 11 am by the women at Y axis. Each glyph was worked out for each woman (Fig 4) and the total scores obtained for each woman are also presented in the Table 54.

Table 54 Fluctuations in energy expenditure of the fisherwomen

Details of women	Distribution of hours in a day												Total score
	3 - 5	5 - 7	7 - 9	9 - 11	11 - 1	1 - 3	3 - 5	5 - 7	7 - 9	9 - 11	11 - 1	1 - 3	
1	166.92(3)	262.08(3)	262.08(3)	262.08(2)	248.00(1)	201.24(1)	140.40(1)	215.28(2)	187.20(2)	117.00(2)	93.60(2)	93.60(2)	23
2	145.80(3)	255.96(2)	272.16(2)	272.16(2)	239.76(1)	233.56(2)	233.25(2)	195.40(2)	141.75(1)	97.20(2)	97.20(2)	97.20(2)	23
3	175.50(3)	227.76(2)	262.08(2)	262.08(2)	262.08(2)	219.96(1)	143.53(1)	227.76(3)	187.20(2)	109.20(2)	93.60(2)	93.60(2)	24
4	99.60(1)	199.20(1)	272.24(2)	278.88(3)	278.88(3)	278.88(3)	229.08(2)	199.60(2)	199.20(2)	128.65(2)	99.60(3)	99.60(3)	27
5	110.00(2)	224.44(2)	262.08(2)	262.08(2)	262.08(2)	262.08(2)	243.32(2)	202.80(2)	209.04(2)	156.00(3)	93.60(2)	93.60(2)	25
6	163.80(3)	240.42(2)	262.08(2)	262.08(2)	246.48(1)	224.64(1)	152.10(1)	198.09(2)	175.50(2)	93.60(2)	93.60(2)	93.60(2)	22
7	99.60(1)	227.38(2)	278.88(3)	278.08(3)	278.08(3)	278.88(3)	268.93(3)	239.04(3)	225.76(3)	186.75(3)	99.60(3)	99.60(3)	33
8	135.72(2)	255.84(2)	262.08(2)	262.08(2)	262.08(2)	262.08(2)	234.00(2)	205.92(2)	187.20(2)	120.90(2)	93.60(2)	93.60(2)	24
9	93.60(1)	237.14(2)	262.08(2)	262.08(2)	262.08(2)	258.96(2)	215.28(2)	234.00(3)	187.20(2)	187.20(3)	93.60(2)	93.60(2)	25
10	149.76(2)	249.60(2)	262.08(2)	262.08(2)	262.08(2)	237.12(2)	187.20(2)	187.20(1)	167.70(1)	93.60(2)	93.60(2)	93.60(2)	22
11	145.80(2)	262.44(2)	272.16(2)	272.16(2)	272.16(2)	233.28(2)	200.88(2)	226.80(2)	230.04(3)	105.30(2)	97.20(2)	97.20(2)	25
12	159.12(2)	224.64(2)	262.08(2)	262.08(2)	262.08(2)	262.08(2)	215.38(2)	212.16(2)	187.20(2)	128.70(2)	93.60(2)	93.60(2)	24
13	117.00(2)	234.00(2)	262.08(2)	262.08(2)	262.08(2)	262.08(2)	152.72(2)	187.20(1)	205.92(2)	93.60(2)	93.60(2)	93.60(2)	23
14	147.60(2)	255.84(2)	275.52(3)	275.52(3)	275.52(3)	252.56(2)	216.40(2)	216.48(2)	196.80(2)	98.40(2)	98.40(3)	98.40(3)	28
15	93.60(1)	236.88(2)	262.08(2)	262.08(2)	262.08(2)	262.08(2)	199.68(2)	212.16(2)	179.40(2)	93.60(2)	93.60(2)	93.60(2)	24
Mean	134.03	239.56	266.12	266.55	262.09	248.63	208.81	210.65	191.14	120.65	95.20	95.20	25
SE	28.35	17.67	6.13	6.79	11.81	22.51	38.99	16.20	22.03	32.21	2.43	2.43	
M ± SE	105.68 162.38	221.95 257.17	259.99 272.25	259.76 273.34	250.28 273.94	226.12 271.14	169.82 247.84	194.45 226.85	169.11 213.17	88.44 152.86	92.77 97.63	92.77 97.63	
CV	21.15	7.35	2.30	2.55	4.51	9.05	18.67	7.69	11.53	26.70	2.55	2.55	

FIG 4 FLUCTUATIONS IN ENERGY EXPENDITURE OF THE FISHERWOMEN



As revealed in the Table 54 scores obtained were in the range of 21 to 33.

Based on the mean energy expenditure, the women were classified into three groups, depending on the energy values below mean, between mean and above mean. A detailed analysis of energy expenditure on the basis of the intervals specified depicted fluctuation. Days of these women started from 3 am. The energy expenditure pattern during the early morning days from 3 to 5 am revealed that out of 15 women only 4 women spent energy below mean, while 7 women spent energy over mean, probably during these times, only four women were sleeping and taking rest while the remaining 11 women engaged in various domestic works before leaving home. The fluctuation in energy expenditure between mean or above mean values indicates the volume of domestic chores done by these women.

During 5 to 7 am, the women usually spent at the market or coastal areas to collect fish for vending. Only one woman was found to spend this interval also at home taking rest while the remaining 12 women and 2 women were spending the energy expenditure between mean and above mean respectively during the period. 7 to 11 am was the busiest period of the day to these women when they would be mainly engaged in fishvending activities. Only 3 women were found to spend energy above mean while the energy expenditure of 12 women were between mean.

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During 11 am to 1 pm three women were found to return home and spend less energy by taking rest or by attending simple domestic chores. These women were invariably found to be very active during the early hours while 3 women who were taking rest during the early hours of the day were found to spend their periods also in fishvending.

During 3 to 5 pm intervals only three women who returned home earlier were found to spend less energy while all the remaining 12 women were found to be busy with fishvending, and spending energy between mean and above.

In 7 to 9 pm interval these women were found busy in domestic chores like marketing, collecting fuel and water or cooking while only 2 women used this time for taking rest.

Analysis of the remaining period of 11 pm to 3 am reveals that the average energy expended by the women is only 95.20, being the rest period.

4.6.6 Biochemical study of blood constituents like heamoglobin, total protein, albumin and vitamin A

Biochemical methods involve estimating the levels of nutrients present in blood. They yield reliable data regarding the nutritional status of the individuals with respect to the nutrients estimated. Heamoglobin estimation would help to assess whether the individual is anaemic or non anaemic. Estimation of

serum total protein, albumin and Vitamin A were determined to assess the nutrient deficiency. The results obtained are presented in Table 55 (Fig.5,6,7and 8) and the details are furnished in Appendix XVII.

Heamoglobin content present in the blood of fisherwomen revealed that the majority of them (66.67 per cent) were anaemic and were below the normal range of 13.0 to 15.0 g/100ml. But only 33.33 per cent had normal range of haemoglobin.

Low level of total protein was found in the majority of fisherwomen (66.67 per cent) studied. But 33.33 per cent had a normal range of total protein of 6.5 to 8.0 gm.

In case of albumin content, 46.67 percent were below the normal range but 53.33 per cent had 4.0 to 5.5 gm albumin and they were in the normal range.

The majority of women (86.67 per cent) had a very low vitamin A content in their serum. Only 13.33 per cent had the normal level of vitamin A.

Compared to their counter-parts in the community the fisherwomen studied were found to have certain advantages. Unlike the unemployed women, these women being economically independent were found to take better type food and it is reflected in the serum profile studied. However these women

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Table 55 Constituents present in blood collected from the fisherwomen

Cellular constituents	Normal range*	Details of fisherwomen
Heamoglobin (g)	13.0-15.0	
Below 13.0		10 (66.67)
13.0-15.0		5 (33.33)
Total		15 (100)
Total protein (g)	6.5-8.0	
Below 6.5		10 (66.67)
6.5-8.0		5 (33.33)
Total		15 (100)
Albumin (g)	4.0-5.5	
Below 4.0		7 (46.67)
4.0-5.5		8 (53.33)
Total		15 (100)
Vitamin A (ug)	25.0-90.0	
Below 25.0		13 (86.67)
25.0-90.0		2 (13.33)
Total		15 (100)

* Source: Swaminathan (1986).
Numbers in parenthesis indicate percentage of fisherwomen

FIG 5 HAEMOGLOBIN LEVEL OF THE FISHERWOMEN

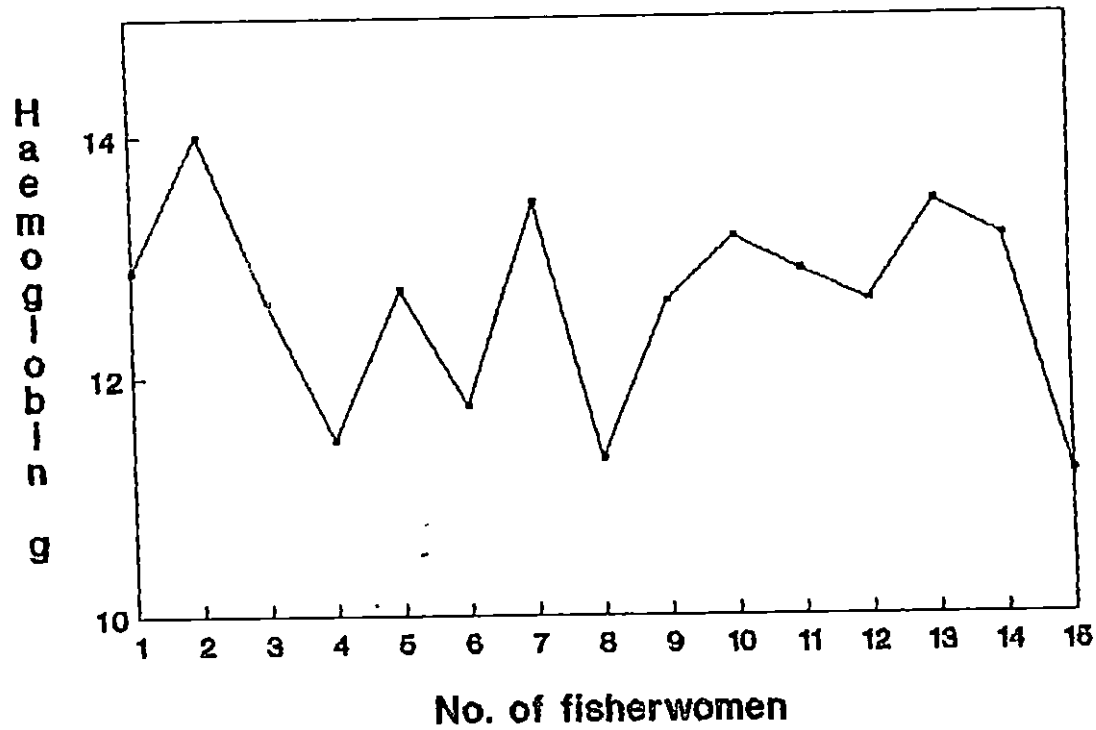


FIG 6 SERUM TOTAL PROTEIN LEVEL OF THE FISHERWOMEN

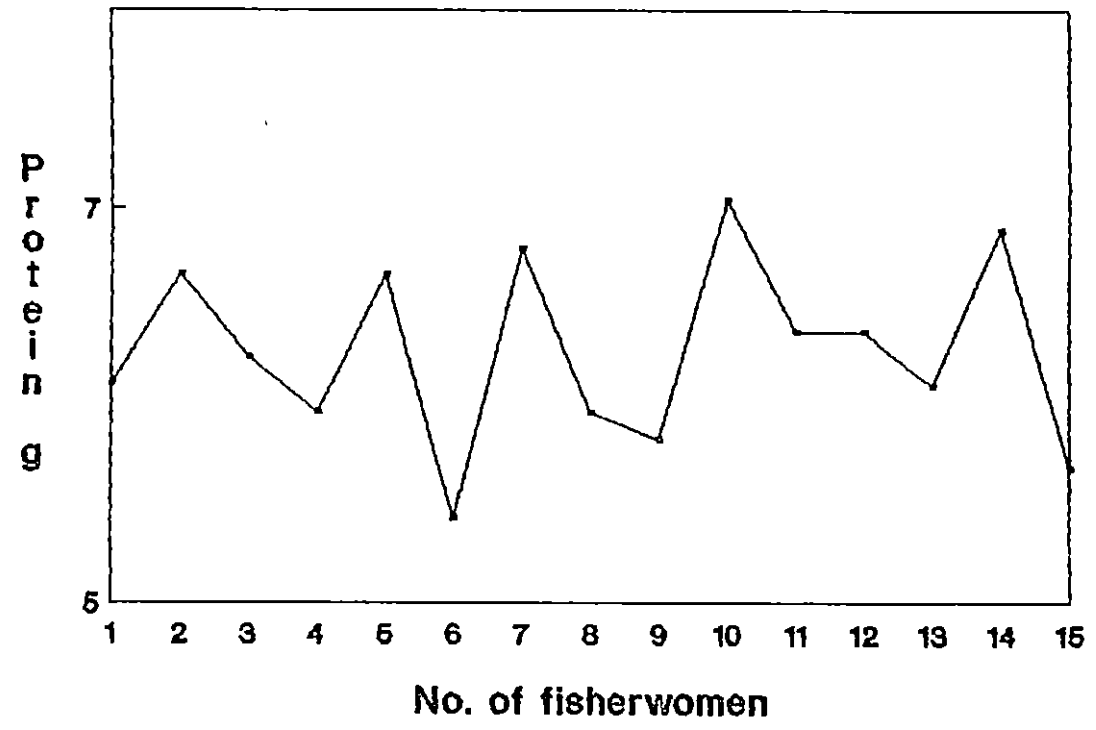


FIG 7 SERUM ALBUMIN LEVEL OF THE FISHERWOMEN

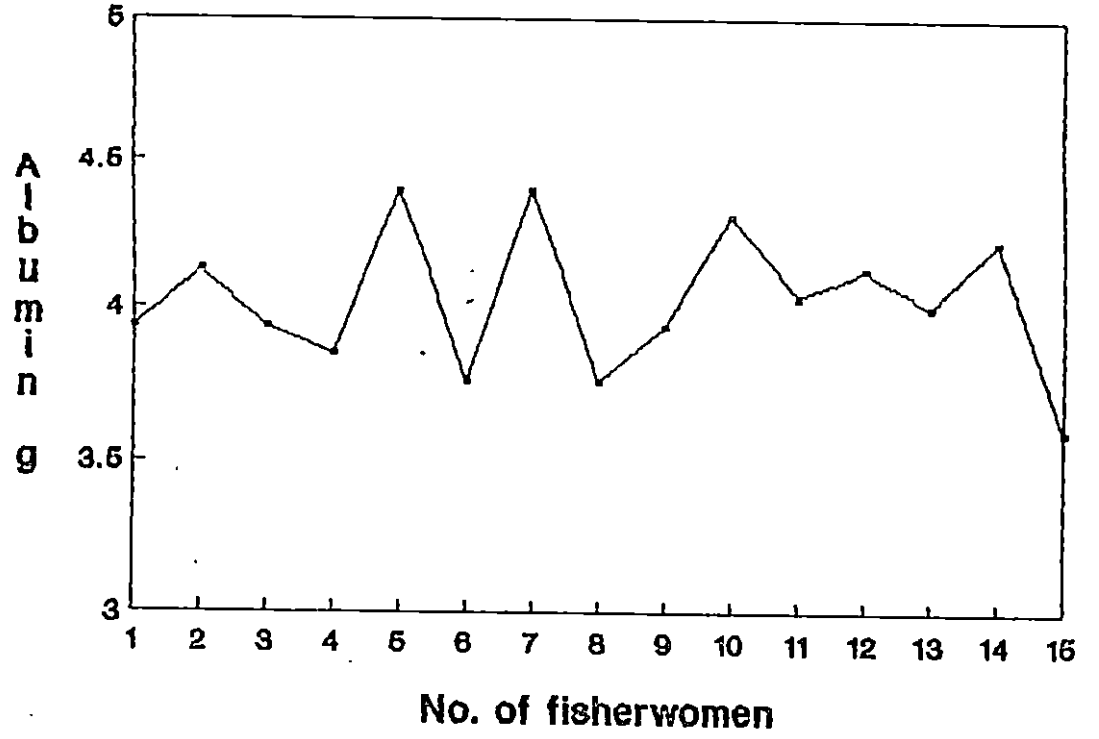
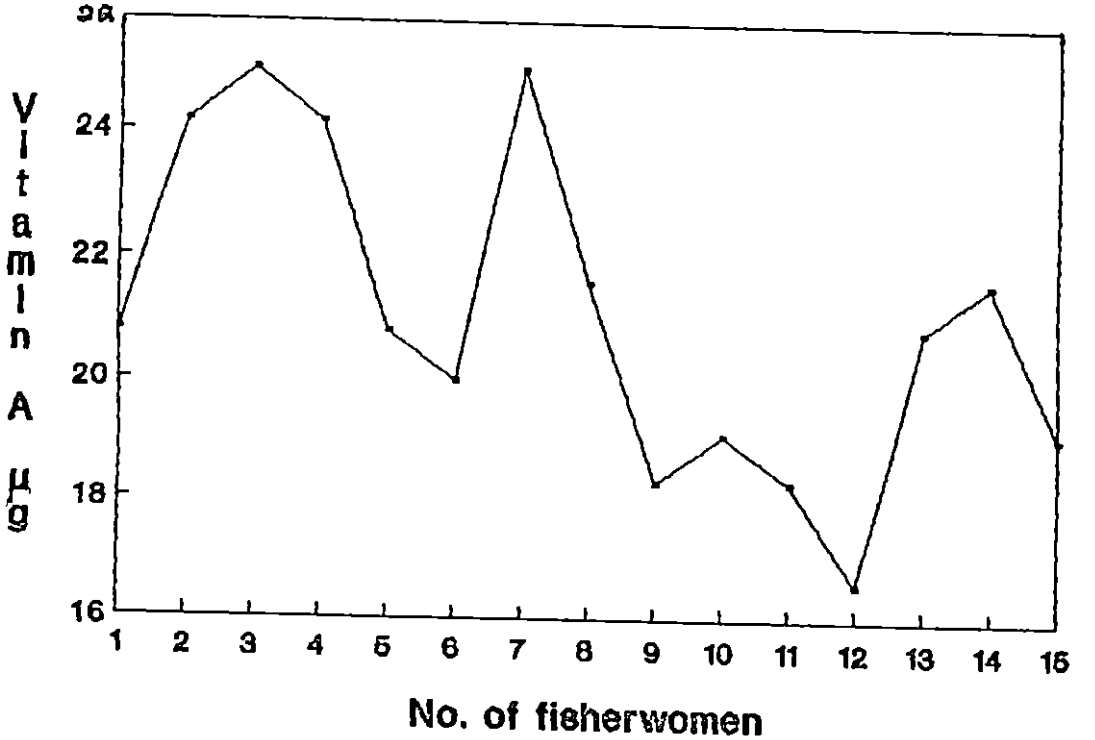


FIG 8 SERUM VITAMIN A LEVEL OF THE FISHERWOMEN



were found to undertake dual responsibilities as wage earners and home makers, causing a lot of drudgery and physical exhaustion in the daily routine. If the activities of the women are lessened or made easier by providing vehicles and other facilities the nutritional status of these women can be tremendously improved.

DISCUSSION

DISCUSSION

The present study was carried out to assess the nutritional status of the women engaged in fishvending in Trivandrum District. For this 150 fishermen families were selected. Each family consisted of atleast one woman engaged in fishvending. The assessment of nutritional status was made through surveys on the socio-economic and food consumption pattern of the families, personal characteristics of the fisherwomen, their dietary habits, daily energy expenditure, occupational details, health problems, and through their clinical examination, anthropometric measurements and bio-chemical investigations.

5.1 Socio-economic profile of the fishermen families

A clear cut conceptualization is a pre-requisite for notional estimation of the incidence of socio-economic situation of the population and to formulate and implement appropriate programmes for the alleviation and eradication of the problems identified. With this aim, socio-economic profile of the fishermen families were also ascertained.

5.1.1 Social status of the fishermen families

A study conducted among fishermen community in Kerala by KAU (1989) threw light on the religious pattern of this community. As per the findings of the study, people of all the three major religions viz., Christians (37.20 per cent), Hindus (32.90 per cent) and Muslims (29.90 per cent) were found to have

uniform representation. According to a report published by Government of India (1990) communal distribution in fishermen community varied widely from district to district. According to a study conducted by the Government of Kerala (1990), in the marine sector, Christian community predominated especially in Trivandrum and Alleppey districts. A report on a survey conducted around Trivandrum coastal areas also revealed that almost all fishermen families in southern region were from christian religion (Anon., 1989). The results obtained in the present study also indicated that the fishermen families in the area belonged to christianity.

All the families located in Valiyaveli survey area were found to be Mukkuvas. The important fishing communities in Kerala were reported to be Mopilla, Araya, Thiyya, Kukkuva, Mukkuva and Valan (KAU, 1989).

Nuclear type families were found to be more popular in this community . Similar trend was observed among the families in Tamil Nadu by Sadasivam *et al.* (1980), who had also found that 42.00 per cent of the families of Tamil Nadu had four to five members. Suja (1989) had reported that 96.67 per cent of the farm families residing in the neighbourhood of valiyaveli were nuclear type families, with husband, wife and their children residing under one roof.

All the families surveyed had followed Patriarchal family system. In this study, only 6.67 per cent were found to be female headed. Giriappa (1988) had also discovered that 37.60 per cent of the families surveyed in Karnataka State, were female headed households. He further reported that female headed households had poor survival chances, greater dependency on wage income, high rate of involuntary unemployment and illiteracy.

Eventhough Kerala advocated for small families there were certain sections of the population in the state who generally refrained from such ideas. Fishermen community was reported to be one among them. In this study also 72.00 per cent of the families were comparatively of the medium size with less than five members. Unlike the other sectors of population in the state, in this community there were more male members than female members. Their proportion was found to be 437 males for 397 females. Krishna (1988) found that the percentage of men, women and children in the fishermen population of Cochin were 37.50, 36.00 and 26.50 per cent respectively with average family size of 5.60. Percentage of women in the age group of 30 to 40, formed 42.67 per cent. While in a survey conducted by Government of Kerala (1990), the percentage of women of this age group constituted 26.08 per cent.

5.1.2 Occupational status of the fishermen families

Fishing, fishvending and other activities such as farm labour, business, Government job and employment outside the

country were their main source of livelihood. In the present investigation 75.33 per cent of the families were mainly engaged in fishing and fishvending. In the report published by Government of Kerala in 1990, it has been stated that in marine sector of Kerala, 61.94 per cent of the fishermen were engaged in fishing and the rest in fish marketing and other related activities or in agriculture or in government service. The report further enlightened the point that among the marine fishermen households, 94.81 per cent had taken up fishing as a hereditary occupation and the rest had taken it up voluntarily due to its profitability. According to Krishna (1988), 57.00 per cent of the fishermen population in the Cochin coastal area were engaged in marine fishing as labourers and the rest were engaged in other fishery related activities like trading and post harvest operations. Templeman (1985) in his study among fishermen community had found that 70.00 per cent of the fisherwomen were engaged in fish marketing in Andhra Pradesh. It was reported that in Adirampattinam, Tamil Nadu fishermen population were engaged in fish marketing as an income generating occupation and they were interested only in the traditional occupation of fishing and not in marketing (Anon., 1989). Sukumar *et al.* (1991) had also reported that income generating jobs performed by the fisherwomen of Tamil Nadu included only fishing related activities such as net making, net mending, fish handling and also fish marketing.

As per the findings of the present study fish marketing was done by the families either by purchasing fish from the local contractors (40.67 per cent) or from the major markets (58.00 per cent). Earlier surveys had indicated that formerly, women in the fishing trade confined themselves to marketing the fish (Anon., 1986). According to John (1984) the majority of women were fish vendors whether they bought fish from the sea shore or from wholesale markets.

A salient finding of the present study is that only few (1.33 per cent) families had taken initiative to pool the catch among themselves and to give benefit to their women to directly sell the fish through vending process. While in the majority of the families, the male members were surrendering their catch to local contractors or middle men belonging to the major market and the fisherwomen had to wait for their turn to purchase fish for vending from the contractors or middle men. Detailed discussion with the women had further revealed that the men were interested in getting ready cash for their personal use through the sale of their catch, while the money earned by the women would be utilised for the benefit of the family.

Among fisherfolk possession of equipment required for fishing was considered to be a factor, for determining the economic and social status of the families within the particular community. Eventhough 85.33 per cent of the families were engaged in fishing, only 32.00 per cent of the families owned

different types of fishing equipment. Another study conducted in Trivandrum also revealed that the majority of families did not possess any fishing equipment (Anon., 1989).

5.1.3 Economic status of the fishermen families

The main source of income of the families surveyed was from regular fishing and fishvending (75.33 per cent). It was reported that about 90.00 per cent of the fishermen households considered fishing as their major source of income (Anon., 1991) Jong *et al*. (1987) found that there were three major factors which affected the income level of fishermen families, viz., type of fishing gear utilised, participation in non-fishing activities and contribution made by other household members.

It can be seen that 70.67 per cent of the families had a monthly income range of Rs.1000 to 2001. A survey conducted by the Government of Kerala (1990) had indicated that 85.00 per cent of the households were in the income group of Rs.1000 to 2000 per annum. But as per the survey conducted by KAU (1989), 38.80 per cent of the fishermen families were in the income range of Rs.500 to 1000 and 38.60 per cent were in the range of Rs.1000 to 2000. In the present study it was found that the economic status of the fishermen families are better than that of the families residing in the adjacent areas, engaged in occupations like agriculture (Suja, 1989) and stone breaking (Sujatha, 1990).

In the present study only 2.00 per cent families were under the poverty line ie., below the annual income of Rs.9000/-. If the family size and annual income were taken as yard sticks for measurement of poverty line, though the average family size was 5.5 the percentage of families which fell below the poverty line was assessed to be low, mainly due to the income earned by the women of these families. It was reported that 61.00 per cent of the households in rural India were below the poverty line with the cut-off point of Rs.9,000 as annual household income (Anon., 1991). According to Singh (1989), 1.63 hectare (4.03 acres) of land per household was the minimum size that was needed to produce an adequate income of Rs.6400/- for rural households. According to Dhanasekaran (1991) the poverty line was fixed at an annual income of Rs.6400/- in rural areas with an average family size of five.

Eventhough 96.00 per cent of the families had their own houses, only 5.33 per cent of the families had essential facilities such as separate kitchen, bathroom and latrine facilities. A survey conducted by KAU in 1989 revealed that 80.40 per cent of the fishermen families had their own houses. A survey conducted in the Valiyaveli fishermen village by a local voluntary agency had revealed that 71.62 per cent of the families in this area had their own houses of which 26.24 per cent had only one room while 24.64 per cent had two rooms and 20.74 per cent had three rooms (Anon.,1989). Constant visits to the area by the investigator revealed that about 70.00 per cent houses

in the area were huts with thatched roofs. Blase (1982) in his study among the fishermen has observed that almost all the fishing families lived in huts of mud or palm leaf walls with thatched roofs.

An interesting point to be noted in this context is that the families with similar income but engaged in other occupations were found to have better infrastructure facilities in their houses. This might be due to the living habits like gambling and drinking acquired by this community through generations. Drudgery as a result of overcrowding and the peculiar nature of their tiresome job may also be responsible for this.

The facility for drinking water supply in this area is rather poor. All the families depended on the city water supply and in 96.00 per cent of the families, the women alone were responsible for fetching water, in addition to other household chores and work outside the house. This inturn has increased their drudgery. UNICEF (1990) had reported that lack of ready access to water and poor environmental sanitation were important underlying causes of various types of infections resulting in malnutrition. Inadequate access to water affects the health of the women indirectly by increasing their work load. In the marine sectors of Kerala, 40.56 per cent of the households had the facility of protected water supply through public taps and 54.91 per cent had wells (Government of Kerala, 1990). However,

67.00 per cent of the families did not have drinking water facilities in the coastal areas of Kerala (KAU,1989).

5.1.4 Family composition based on per capita expenditure

In the Present study 69.66 per cent of the population belonged to vulnerable groups composed of 28.30 per cent women and 41. 36 per cent children. Among the expenditure classes, more population was observed in the expenditure class of Rs.201 - 300 and 301 - 400. Similar trend in population structure was reported by Government of Kerala (1990) and by Jacob *et al.* (1987) who conducted studies in various parts of fishermen community in Kerala State. Varghese *et al.* (1987) had also observed similar trend in population among fishermen residing in West Bengal.

Employment status of the family members based on their monthly per capita expenditure revealed that only 36.81 per cent of the total population studied were employed and others were dependents. A study conducted by Sathiadas and Panicker (1989) in Madras coastal areas revealed the ratio between earning members and dependents in a family to be approximately 1:3. They further reported that 36.00 per cent of the total population were employed. Of this 32.00 per cent were engaged in activities related to fishing while the remaining were in other sectors like services and business.

5.1.5 Monthly expenditure pattern of the fishermen families

Monthly expenditure pattern of the fishermen families were found to increase in accordance with the rise in income. In the present study it was observed that food expenditure was the major item. Majority of the families spent 39.65 to 66.60 per cent of their expenditure on food. Percentage of income spent on food gradually decreased from the lowest class to the highest class except in the last expenditure class of Rs >600. It shows that when the income increased the amount spent for food reduced. A survey conducted in Andhra Pradesh revealed that 51.43 per cent of the income was spent on food (Agricultural Finance Corporation, 1980). In Maharashtra, out of the total annual expenditure for mechanized and non-mechanized group of fishermen, 61.10 and 58.00 per cent of the income was spent on food (Anon., 1988 a). Prema and Menon (1980) reported that 78.00 to 93.00 per cent of the monthly income of the fishermen families residing in Trivandrum coastal areas was spent on food items. Food expenditure varied from 59.90 to 62.30 per cent of the total income among fishermen families of Maharashtra (Anon., 1988). A survey conducted by NIN (1985) revealed that in low income groups over 90.00 per cent of the family's income was used up for providing the essentials such as food, clothing and shelter. Godawari *et al.* (1987) found that in Tamil Nadu, around 65.00 per cent of the families spent 60.00 to 80.00 per cent of their income on food. Earlier studies conducted in Trivandrum coastal

area revealed that on an average, each family spent about Rs.125.89 per head for food alone (Anon., 1989).

For clothing the families were found to spend negligible percentage of their income. Compared to the lowest expenditure class, middle class families were found to spend 1.15 to 3.12 percent for clothing. This may be due to the low purchasing power of the former. Expenditure on fuel was almost equal except for the last two classes.

Expenditure on transport was higher than the other items of expenditure set apart for the welfare of the family like education, health and electricity, because the majority of the fisherwomen carried their fish by bus or three wheelers to various markets of the city. Similar trend in expenditure was noticed by Natapracha and pieterz (1984) in Adirampattinam of Tamil Nadu. Sathiadas and Panicker (1989) found that in coastal areas of Madras 6.00 to 14.00 per cent of the family expenditure of fisher folk was on transportation and entertainment.

Expenditure on education and health was found to be very low and it ranged from 0.26 to 2.55 and 0.12 to 0.31 per cent respectively. This low expenditure on education is due to the fact that only two children are sent to schools. Prema and Menon (1980) have reported similar expenditure pattern in a study conducted at Trivandrum coastal areas. Sathiadas and Panicker (1989) noted that the expenditure incurred for education and medical care by the fishermen families in Madras coastal areas

was very low. The people in the fishermen community in Trivandrum coastal areas were conscious about education. However they were ill-equipped for higher education and not capable to compete with others. Financial inadequacy is found to be the major reason for not sending children to school and lack of motivation and diseases were reported to be other major causes of illiteracy (Anon., 1989).

A Comparison of the expenditure on personal needs of the respondents with that of their husbands, revealed that their spouses spent greater amounts than the respondents. Most of the male members of the families spent their income on alcohol and gambling. The women spent mainly for taking foods and betel leaves during their working time. Selvaraj *et al.* (1987) found that the male members of the fishing households suffered from social problems of alcoholism. In the present study also similar habits were noted among the male members. It was observed that this habit also adversely affected the economic status of these families.

Maintaining the economic status of the family was a major problem for the fishermen families. Upto 7.77 per cent of the total family expenditure was utilised for repaying loans and saving was less. Because of the poor habits of the male members, women were responsible for the economic management of the families. The majority (92.00 per cent) of families in this community were in debt. So they were forced to take loans for

buying fish for marketing. A survey conducted among the fishermen households of the coastal areas revealed that 31.40 per cent of the families had received loans for purchase of fish for sale, 21.13 per cent for the purchase of fishing equipment and 5.90 per cent for building houses (Anon., 1989). Natapracha and Pieterz (1984) had also observed similar trends in a study conducted at Adirampattinam. Natapracha (1986) reported that in Bengladesh 62.00 per cent of the fishing families were in debt and 35.00 per cent had no savings. Krishna (1988) observed that the fishermen families were caught in a vicious circle of borrowing and paying back money which resulted in low savings and heavy debts. A major reason attributed to the situation was reported to be seasonality of the occupation.

5.2 Food consumption pattern of the fishermen families

The food consumption pattern revealed gross inadequacies as far as the women's diet was concerned. Inadequate food intake was attributed to poverty or less fortunate economic situation. However, factors like food preferences, availability of food items in the locality, knowledge of nutritional values of certain food items relative prices of food articles and urgency of non-food expenses were also found to determine priorities in food expenditure. As revealed in earlier studies of Suja (1989), Felsy (1989) and Sujatha (1990) in Trivandrum district, the food consumption pattern of the fishermen families was also observed to be habitual non-vegetarian type with rice as the staple food.

NIN (1885), Preet and Bhavana (1988) and Parvathi and Babitha (1989) found that cereals especially rice continued to be the major staple food item among South Indians.

5.2.1 Monthly food expenditure pattern of the fishermen families

Rice, being the staple food of the Keralites, accounted for the major expenditure on food. Prema and Menon (1980) conducted a study in the coastal areas of Trivandrum and found that they spent 76.00 per cent of the income on carbohydrate rich foods like cereals and roots. Similar trend in expenditure was observed among Kanikkar families (Felsy, 1989), among women engaged in stone breaking (Sujatha, 1990) and among women engaged in agriculture (Laisamma, 1992) in Trivandrum district. Godawari *et al.* (1987) found that around 50.00 per cent of the families in Tamil Nadu spent 30-40 per cent of their food expenditure on cereals.

Unlike the earlier studies conducted in Trivandrum district, in the present study, the families were found to spend a greater amount on fruits and milk and milk products. However, expenditure on food items like vegetables, pulses, egg and green leafy vegetables was considerably low and this is in line with the earlier findings. Main reason for avoiding the above protective foods as observed by the investigator was ignorance and lack of knowledge about nutritious food. A study conducted in rural areas of Uttar Pradesh revealed that the consumption of

pulses and vegetables was occasional due to ignorance. Godawari *et al.* (1987) reported that in Tamil Nadu, 4.00 per cent of the families did not spend any amount on leafy vegetables and others spent less than 6.00 per cent of their food expenditure on it. Compared to the other states the expenditure on nuts and oil seeds was high in Kerala. The same trend was observed in the studies of Sujatha (1990) and Felsy (1989). Expenditure on fish was very negligible because it was available free of cost as they were fish vendors. The same trend was noticed by Prema and Menon (1980) in Trivandrum coastal areas.

5.2.2 Projection on the maximum and minimum expenditure on food for fishermen families

To meet the balanced diet requirement, the fishermen families had to spend about Rs.6.82 to Rs.8.52 per day ie., Rs.204.60 to 255.60 per month. Only very few families (4.00 per cent) had spent the above amount for a balanced diet. For most of the families, the daily diet consisted of rice and fish and the consumption of other food items was very low. A study conducted in Maharashtra among farm families revealed that, unit cost of diet was Rs.4.36 per day and it accounted to be Rs.130.80 per month. He further reported that the food expenditure was 72.14 per cent of their income. (Wadker *et al.*, 1988).

5.2.3 Relationship between selected socio-economic variables and food expenditure of the fishermen families

Expenditure on food is generally associated with various socio-economic factors. In this study, it was found that all the selected socio-economic variables like family size, family income, number of members employed in a family, age of the fisherwomen and fisherwomen's income had influenced the total expenditure on food. Vijayalakshmi and Devaki (1976) observed a positive correlation between income and the diet chosen by families residing in the rural areas of Tamil Nadu. Paramjit *et al.* (1983) found that income, occupational level and family size had affected the food intake. Wong (1985) found a direct relation between family income and expenditure on food. In addition to the total expenditure on food, fishermen families in this area spent a considerable amount on convenient foods and meals outside their home.

5.2.4 Frequency of use of different food items by the fishermen families

Frequency of use of various food items depicted that the daily diet in most of the families comprised of food articles like rice, coconut, fish and sugar, and beverages like coffee or tea, eggs, pulses, green leafy vegetables and fruits were absent in their diets either due to lack of income or lack of knowledge. Earlier surveys conducted in Trivandrum district among women

engaged in stone breaking found that they consumed pulses, green leafy vegetables and eggs occasionally. The author further reported that this might be due to high cost, non availability and ignorance (Sujatha, 1990). Similar findings were observed in surveys conducted in other parts of India. Consumption of pulses and vegetables was reported to be occasional in rural households of Utter Pradesh (Anon., 1987). Krishna (1988) in her survey conducted among fishermen families had observed that foods like vegetables which were the major sources of vitamins and iron were rarely included in the diet. Prema and Menon (1980) observed that nutrients like calcium, iron, and vitamin-A were not available in adequate amounts due to the absence of fruits and vegetables in the diets of fishermen families of Trivandrum district.

Inadequate intake of food was the root cause of widely prevalent under nutrition. A survey conducted by ICMR in 1981 had revealed that an adequate diet or a balanced diet which provided all the essential nutrients in sufficient quantities was necessary for good health. In this study it was found that the food items of a balanced diet were not included in their daily diet. The major food item was rice and fish curry prepared with coconut. Krishna (1988) found that in Cochin the diets of the fishermen community, consisted mainly of rice and fish. The quantity and frequency of consumption of other protein foods such as egg and meat were very low and the foods like vegetables were rarely included in the diet. Similar trend was observed in this

community also. Bhavani (1986) also observed similar results among the families from the states located at the eastern regions of the country.

5.2.5 Relationship between selected socio-economic variables and food use frequency

Frequency of use of different food materials can be used as an indicator of nutritional adequacy of a meal. And frequency of use of food is associated with several socio-economic factors of the family. In this study, family income and fisherwomen's income were negatively correlated with certain food items. On further study it was revealed that family income was negatively correlated with frequency of use of green leafy vegetables, other vegetables and milk. While the frequency of use of milk alone was negatively correlated with the income earned by the fisherwomen. Family size, number of members employed in a family, and age of the fisherwomen showed no association with the frequency of use of various food items. But Kumar *et al.* (1976) reported that family size influenced the food intake of families of low socio-economic groups. Paramjit *et al.* (1983) observed that income, occupational level and family size were the major variables affecting the food intake of the families.

5.2.6 Food habits of the fishermen families

Most of the households in the study area, cooked foods only once in a day. And this was in line with the findings of a study conducted in rural areas of Utter Pradesh (Anon., 1987). Cooking methods practised and cooking vessels used by these families were found to be the popular common vessels used by the various communities of Kerala.

Daily meal pattern indicated that the three meals a day pattern namely, breakfast, lunch and dinner was the accepted norm of 76.00 per cent families studied. Rest of the families skipped either one of the three meals due to lack of time or money. Gincy (1987) had observed three meals a-day system among most of the fishermen families in Trivandrum district. But according to Prema and Menon (1980), 96.00 per cent of the families consumed only two meals a day and only 4.00 per cent took three meals a day among the fishermen families of Trivandrum.

As in the case of the other communities in Kerala, cereal preparations, cereal and dhal preparations and wheat preparations with coffee or tea were found to predominate the breakfast of the fishermen families also. Similarly cereal and fish preparations were the major items for lunch and dinner. Their meals were supplemented sparingly with vegetables or fruits. Krishna (1988) had found that the diet of the fishermen families consisted mainly of rice and fish which supplied 75.00 per cent of the calories and 50.00 per cent of their protein needs. All the

families generally celebrated occasions like anniversaries, birthdays, marriages and religious festivals by including nutrient rich foods in their diet on the specific days.

An enquiry into the child feeding practices followed by these families revealed that in 98.67 per cent of the families breast milk was supplemented with either cows milk or supplementary foods or commercially prepared baby foods. Suja (1989) and Felsy (1989) had observed that the pre-school children's diet were inadequate with respect to the quantity and quality of foods. Bhat and Dahiya (1985) had indicated that the majority of Indian children received only ordinary home diets and those diets were deficient in many nutrients like vitamin A, C and iron.

It was alarming to note that adolescents, pregnant and lactating women were given no special foods to nourish their daily diet probably due to lack of income and knowledge about the importance of the above periods in ones life. It has been reported that the mean nutrient intake of the expectant mothers in low income groups was inadequate in calories (Rajammal *et al.*, 1980).

Parvathi and Babitha (1989) in their studies among rural females of Khasis of Meghalaya found that special conditions like pregnancy and lactation did not receive any special attention except in an increased intake of the normal adult diet.

Prema *et al.* (1983) had reported that the Kanikkar women of Trivandrum district in Kerala, were given no special foods during pregnancy and lactation. Gopaldas (1987) reported that women of the Rathwas of Gujarat were reported to be aware of the increased dietary needs during pregnancy and lactation. Rajammal and Parvathi (1986) reported that the food intake of pregnant mothers was glaringly deficit in terms of energy and other nutrients. Saha and Kanchan (1991) found that the pregnant mothers in rural areas were not aware of the special health care needs of pregnancy.

Food restrictions were mainly observed in some families by withdrawing solid foods from the diets of the sick persons in fever and diarrhoea. Parvathi and Babitha (1989) in their studies among rural males and females of Khasis of Meghalaya had found that bland diets were given during fever, diarrhoea and chicken pox. But 81.33 percent of the families in the present study did not observe any diet restriction for asthma or common cold.

Culinary practices including cooking methods, and type of fuel and utensils used for cooking, revealed that women were unaware of the scientific culinary practices. This observation is in line with the finding of Suja (1989), Sujatha (1990) and Laisamma (1992).

5.2.7 Developing an index based on selected socio-economic variables

Among various socio-economic variables studied few variables were taken into consideration to develop an index by which quality of life of fishermen families could be ascertained. Among the social characteristics, caste and education level of the fisherwomen family were considered as important indicators. Since the hierarchy of caste groups and educational level of an individual were considered to be important inputs hampering economic progress (Government of India 1981). More over Dhanasekaran (1991) has reported that in India, the caste system is mainly responsible for perpetuating poverty in rural areas. Various studies conducted in the rural areas in our country had also depicted that illiteracy was a factor perpetuating poverty. According to Charyulu and Narayana (1987) education is one of the most dynamic factors in the development of rural areas and they further reported that education is considered as an essential component on the cultural revolution for stimulating equality among people of both sexes; for better socialization and for bringing about greater awareness among people. Education is recognized as an important social input which helps an underdeveloped community to seek ways and means of bringing about changes to develop itself and solving its social and economic problems (Government of India 1981). This is also considered as an asset for the removal of poverty. Hence variations in

educational level among the fishermen community were also included as indicators to ascertain the quality of life.

Occupational structure is a factor which may throw light on the poverty status of any area. In this study, majority of the family members were casual workers engaged in fishing or fishvending. These families were also found to have no assets in the form of fishing equipment including fishing boats. Their access to such facilities were lacking. Very few had regular full time employments like government jobs or employment outside the country. Wide variation in the occupational status within fishermen families justifies the inclusion of this factor as a variable that determines the quality of life.

The household income is basically related to the quality of life and hence was considered as an indicator. In this study, to correct the difference caused by the family size, per capita income instead of total family income of the family was taken in to consideration. Because, the families with a relatively higher proportion of unemployed persons and persons unable to do work, would suffer from low per capita income.

In earlier studies poverty was measured by the yard stick of minimum calorie intake which was propounded by the Planning Commission (Mathur, 1982). As per the seventh five year plan draft, the recommended energy requirement as 2400 calories per person per day in rural areas (Dewett *et al.*, 1990). According to Wadker *et al.* (1988) an optimum proportion of calories and

proteins is necessary in balanced diet. In the present study calorie and protein requirements were considered as the basis for developing the quality life index using the approved RDA suggested by ICMR (1989). Extensive diet surveys carried out in the country showed that a sizable proportion of the population belonging to low income groups and with low quality of life was unable to fulfill the requirements of nutrients including the major ones like calories and proteins (Krishna, 1988).

The economic and social status of a family can be determined by the food expenditure pattern. It is an acceptable fact that poor households would spend higher proportion of their income on food. Lipton (1989) in his study on under nutrition and poverty has recorded similar findings. The major findings of Rao (1987) through his study in India had also reflected similar results. Next to food, clothing and shelter were considered as two factors important to meet the basic needs of a family. Moreover, poverty could be reflected by the kind of clothing. Hence the amount spent for clothing (monthly) was also included as an indicator.

The quality of life of an individual could be determined by the type of shelter available to them. Lack of availability of shelter would reflect the socio-economic status. Hence the type of housing was also accounted as an indicator.

On the basis of quality life index developed using different indicators collected from the fishermen families, it was evident that all the families lived below the poverty line. This may be due to the prevailing social, economic and cultural obstacles in the study area. A study conducted on similar lines in the rural areas of Tamil Nadu by Dhanasekaran (1991) revealed that 82.00 per cent of the families lived below the poverty line.

5.3 Time utilization pattern of the women engaged in fishvending

Time allocated for various domestic chores and for activities outside home in relation to selected personal characteristics of the women are discussed under this section.

5.3.1 Personal characteristics of the women engaged in fishvending

The fisherwomen surveyed (97.33 per cent) were between the age of 26 to 50 years. It was found that because of the economic necessity many of the women of this age group in this area were forced to go for fishvending.

Literacy and educational attainments are the indicators of qualitative improvements in human resources and female literacy is said to hold the key to the generation of full genetic potentials pertaining to health and nutrition and for the family planning. It was found that 70.67 per cent of the selected fisherwomen of Valiyaveli were found to be literate, against

59.00 per cent of total fisherwomen population of Kerala. According to Krishna (1988) the literacy rate of fisherwomen in Cochin was 36.00 per cent and in Kerala it was 59.00 per cent (Government of Kerala, 1990 and KAU, 1989) which is the highest rate among fisherwomen in India. In this area only very few women had education up to high school level mainly because of their poor economic condition and the compelling need to take up fishvending activity. The literacy level of fisherwomen of Valiyaveli was lesser than the literacy level of women agricultural labourers in Trivandrum which reported to be 84.00 per cent (Suja, 1989). Kuttykrishnan and Suchetha (1989) reported that the main reason for illiteracy was the poor economic background, baby sitting, constant failure and early marriage.

Another factor which influences family status is the marital status of the fisherwomen. According to a report published by the Government of Kerala (1990), 39.81 per cent women living in the coastal areas were married. In the present study, all the fisherwomen selected were married but 1.33 per cent were divorced and 5.33 were widows. Early marriage was noticed in this area. Kuttykrishnan and Suchetha (1989) reported that among rural labour households of Kerala 80.10 per cent of the women were married before the age of 18 years. As reported by Suja (1989) early marriage was common among the women of agricultural labourers also from Trivandrum district. Main reason

for the early marriages could be the widely practised dowry system and similar findings were observed by Kuttykrishnan and Suchetha (1989) also.

In spite of the legal prohibition imposed on dowry, in most of the families dowry system was widely practised. Selvaraj *et al.* (1987) had reported that the fishing households in Tamil Nadu also suffered from similar social problems.

5.3.2 Responsibilities of the women engaged in fishvending

All fisherwomen have to complete all the household chores before leaving for fishvending. They were found to spend 10 to 14 hours a day attending to these routine chores. Similar situation was observed among rural women of Bengladesh by Elizabeth (1978).

Physiological stress periods like pregnancy and lactation calls for much care and increased the need for nutritious foods in the diet. But the fisherwomen in this area did neither receive any special care nor good nutrition because of poverty Hence 72.00 per cent of the respondents used to go for fishvending for more than seven months during pregnancy and three months after delivery (76.00 per cent). As a result, the mother had to maintain not only her health but also of the baby and other members of her family. Thimmayamma and Jyoti (1983)

reported that lactating mothers specially those who were working outside home constituted the most vulnerable segment of population.

Child care is a major problem faced by these women. The children were looked after with the help of dependent members of the family or by elder children or with the help of their husbands. Improper care and inadequate food to these children resulted in malnutrition and diseases.

5.3.3 Relationship between selected socio-economic variables and time utilization pattern of the fisherwomen

Women in Valiyaveli start their day very early in the morning with household activities followed by fishvending. Besides household activities, they spent more than ten hours for fishvending activities alone. The selected socio-economic variables showed no influence on the time spent in household activities. Sundari and Kamalanathan (1978) studied the time utilization pattern of some homemakers and revealed that as the number of family members increased, the time spent for household activities increased from 3 hours, 30 minutes to 5 hours, 30 minutes. George and Bafna (1983) found that the home-makers spent most of their time in preparing food and other household activities and the time used was greatly influenced by the size of the family and age of the home makers. The total quantum of household work done by the women was affected by the income of the family and size of the family (Ogale and Ranawat, 1973).

However, in the present study the above mentioned factors were found to have no influence on the household activities.

But the time spent for fishvending activities was influenced by family income, age of the fisherwomen and fisherwomen's income. Compared to other activities, they spent much time for fishvending activities alone. In the present study time available for leisure activities and sleep was negatively correlated with family income, age of the fisherwomen and fisherwomen's income. Ogale and Ranawat (1973) had reported that employed home-makers spent the largest percentage of their leisure time on intellectual activities. Negative correlation was observed only on family income and time spent for leisure activities and sleep.

5.3.4 Salient features of the fishvending activities of the fisherwomen

Besides spending long hours on household work followed by outside work, these women engaged in fishvending were also found to walk long distances to reach their destination. Transportation of fish to the destination was also a difficult and heavy task, since public buses were over crowded and prohibited the transportation of Fish baskets. John (1984) has opined that in Trivandrum district, due to the higher involvement of women who walked to the markets, over half the fish moves only less than 20 kilometers from the coast. The facilities

extended by the Government for easing the work of these women were also not fully utilised. Natapracha and Pietersz (1984) found that the fisherwomen in Tamil Nadu took their fish by bus or train to various markets situated at a distance of 5 to 60 kilometers from their village and a minority walked with head loads of fish to neighboring villages covering 1/2 km to 8 kilometers daily. Blase (1982) also reported similar findings from Adirampattinam, Tamil Nadu. He reported that irrespective of the destination, fisherwomen of this area were reported to spend more than five hours fishvending alone. John (1984) reported that in Trivandrum women engaged in fish distribution spent 9 hours to buy, transport, sell the fish and return home. On an average they spent about 4 hours 30 minutes to sell the fish and those who sold in houses or markets spent about 5 hours, 56 minutes. On an average fisherwomen were reported to spend 7 to 10 hours a day and 5 to 7 days in a week for fishvending.

Daily income of the fisherwomen varied on the basis of the amount spent for buying fish, for fishvending, quality of fish and the season. If the quality of the fish was lower they were forced to sell the fish at a very low price. Natapracha and Pietersz (1984) reported that in Tamil Nadu, the daily investment level was about Rs.50 to 200 for fish purchase and the profit gained varied from Rs.5 to 10 per day. While in the present study the investment level varied from Rs.25 to 200 and above. An interesting fact noticed was that the majority of women were

buying fish either from the major fish market (58.00 per cent) or from the local contractors (40.67 per cent). Fish used for fishvending from their own catch was very rare. From this it was clear that the income management of the family always depended upon the income of the fisherwomen.

5.3.5 Relationship between the fishvending activities of the fisherwomen and selected socio-economic variables

The amount spent for buying fish was associated with certain socio-economic factors. Family size, family income and income of the fisherwomen were found to be associated with the amount spent for buying fish. The major problem among women vendors in business was the need for heavy daily investment (Nandini, 1986). No association was observed between the amount spent for buying fish and the number of members employed in a family and age of the fisherwomen.

5.4 Energy expenditure pattern of the fisherwomen

Fisherwomen in this area had to perform dual functions; since their work exposed them to conflicting expectations between their work outside home and their duties at home. For this they had to spend much energy than they consumed.

5.4.1 Total energy expenditure of the fisherwomen

More than 87.00 per cent of the women were found to spend more energy than the RDA specified by ICMR (1989) for moderate

working woman. Studies conducted among women engaged in stone breaking (Sujatha, 1990) revealed similar results.

5.4.2 Energy expenditure for different activities by the fisherwomen

In the present study, the energy expended for household activities was found to be less than the energy spent for fishvending activities, which was found to be four times greater. The energy spent for leisure time activities was comparatively negligible.

5.4.3 Deviation from energy requirement and RDA of the fisherwomen

Energy expended by women for various activities daily was found to be in the range of 2095 to 2878 kilocalories. In this study a significant relationship was observed between energy expenditure of the fisherwomen and their nutritional status index. Health status of the women working outside their home was a major factor influencing their normal life pattern. Hussain (1988) reported that heavy schedule of work of rural women led to complete physical exhaustion and reducing working efficiency. Bilberg *et al.* (1980) opined that one of the reasons for the negative energy balance of some of the female agricultural workers was the compulsion to spend long hours for heavy work. Negative energy balance was also observed in women engaged in stone breaking in Trivandrum (Sujatha 1990). But Florence

(1989) reported positive energy balance in working women, in the organised sector in Trivandrum. She further reported that this could be due to the fact that all the home makers studied were from educated and well to do families.

5.5 Factors influencing the health parameters of the fisherwomen

Health status of the women was ascertained by assessing the anthropometric measurements with regard to height and weight. According to Ramachandran (1987), the body weight and height for age was a parameter to assess nutritional status. Dodd and Aujula (1989) found that 10.00 per cent of the working women had their body weight below 38.00 kg and height less than 145 cms. In the present study 70.00 per cent were below the ideal height 88.67 per cent were below ideal weight when compared with an Indian reference woman as per the norms of ICMR (1990).

A sub committee of International Dietary Energy Consultative Group (IDECG) suggested that the BMI expressed as 'ratio of weight and height square' (Wt/Ht^2) can be used as a parameter for detecting Chronic Energy Deficiency (CED) for purposes of classifying subjects of deficient calories intake. The cut off points recommended are 16,17 and 18.5. According to NIN (1991), Body Mass Index values between 18.5 and 25 were considered to be compatible with health for both men and women. In the present study about 33.33 per cent women were found to be deficient in energy. Shetty (1989) indicated that the degree of

energy deficiency might influence body weight loss. Vasudevan *et al.* (1980) found that Wt/Ht2 gave a fair estimate of the magnitude of the protein calorie malnutrition.

Various socio-economic factors and quality of life of the individual affect the nutritional status. In the present study, a highly significant relationship was observed between the quality of life index and nutritional status index of the fisherwomen in Valiyaveli. Suter and Hunter (1980) reviewed that nutritional status was influenced by factors such as psychological, socio-cultural and physiological influences. Venkateswara (1991) observed that people living in rural areas and urban areas were not able to lead a life worthy of a human being due to poverty. This health condition was the result of pernicious combinations of several socio-economic factors like unemployment, poor housing, poor sanitation and malnutrition.

5.5.1 Nutritional status index

Nutritional status is an indicator of social well being of a community (Krishna, 1988). In a report published by NIN (1985), it was observed that poor nutritional status lowered resistance to infection. Women, in the lower income strata, even though economically independent were found to have poor nutritional status. Studies were conducted among women engaged in stone breaking (Sujatha, 1990) and in agriculture related operations (Suja, 1989 and Laisamma 1992) had revealed such indication. However, high level nutritional status index was

observed among employed home makers of organised sectors (Florence 1989). In the present study only 14.00 per cent of the women engaged in fishvending had an index over 17.75. The deficient state of the remaining women may be due to physical stress and aliments while plying her trade and because of poor nutrition due to low income and their responsibilities to support large families without much financial help from the male member of the family.

5.5.2 Relationship between nutritional status index and selected socio-economic variables

Krishna (1988) has reported that the majority of fishermen population who belonged to low income groups was not able to fulfill their requirements of calories and protein and hence had shown low nutritional level. Ghosh (1989) reported that social factors like religion, occupation, economics, education, beliefs and culture had important bearing on health. In the present study, there was no relationship between selected socio-economic variables like family size, family income, number of members employed in a family, age of the fisherwomen and fisherwomen's income and nutritional status index.

5.5.3 Clinical examination

Clinical examination of an individual would help to assess the level of health as influenced by the diet they consumed. The prevalence of health problems, most commonly seen in the

fisherwomen were dental caries, mottled enamel, magenta tongue and spongy bleeding gums. The findings also indicated that by and large, the women showed signs and symptoms of multiple deficiencies in the diet. Much of the above symptoms were caused not only due to the deficient intake of nutritious food but also due to the unhygienic and poor personal habits. Elima and Usha (1989) reported that inadequacies in the intake of basic food was the root cause of widely prevalent malnutrition in the country. Mohiuddin (1989) observed that in some villages of Uttar Pradesh, the diet of the people was inadequate and there was a general deficiency of vitamin A with which diseases like anaemia, scurvy and night blindness were associated. In Kanyakumari district, a considerable number of women suffered from partial blindness because of vitamin A deficiency (Blase, 1982). In Valiyaveli 21.34 per cent of the fisherwomen had different types of vitamin A deficiency symptoms.

5.5.4 Factors influencing nutritional status of fisherwomen

A comprehensive analysis of the factors influencing the nutritional status of the women engaged in fishvending revealed that socio-economic status of the families, food consumption pattern, personal characteristics, such as age, educational level and economic dependency and their dual responsibilities were the major determinants of the nutritional status (Fig.9) of the women.

There is a need for comprehensive understanding of nutritional status of different sectors of society. In this study an attempt was made to analyse the social distribution of undernutrition.

Figure 9 is a diagramatic representation of the multiple factors that influence the nutritional status of the fisherwomen, as revealed by the study.

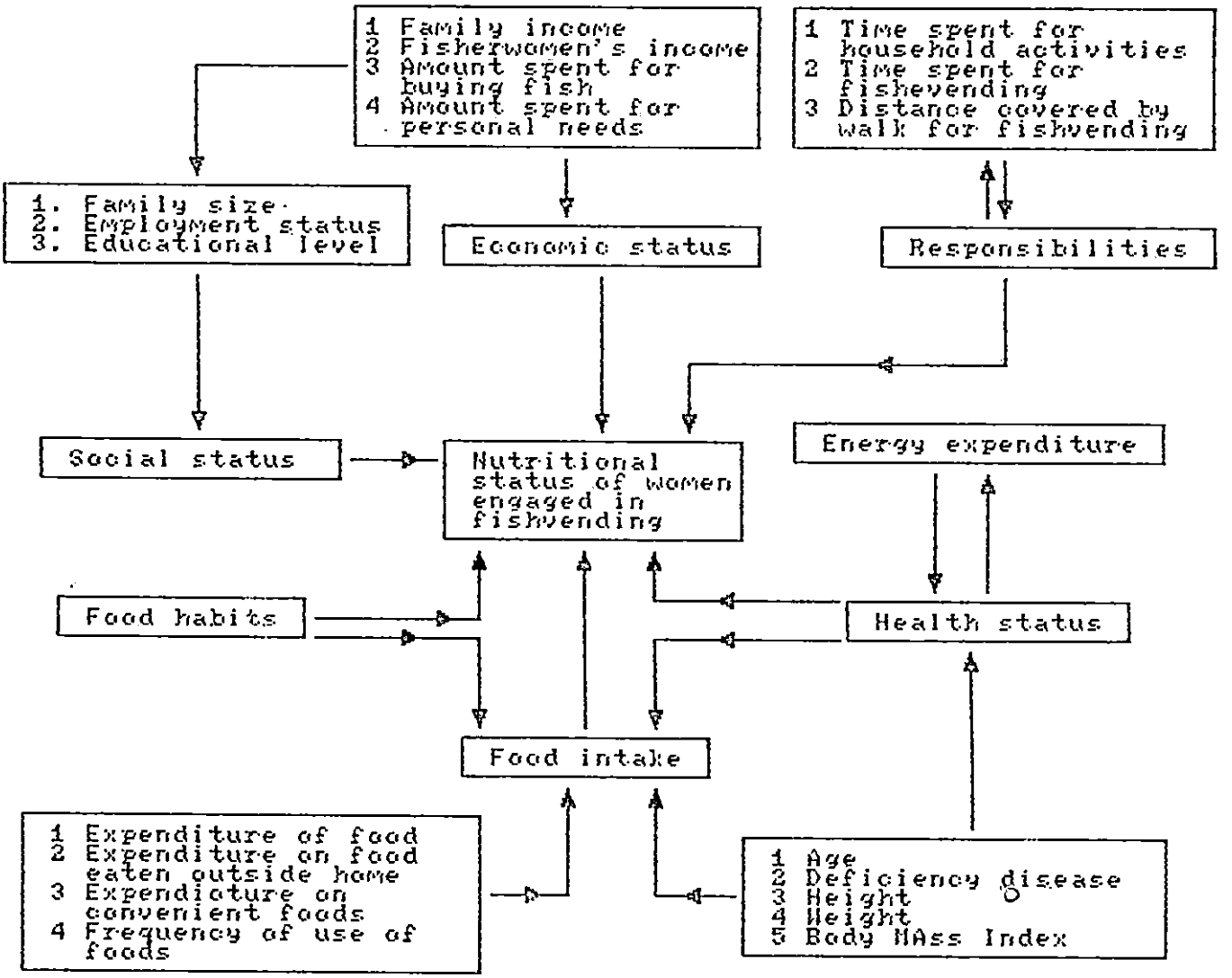
Variables listed in the figure are of two kinds. Variables like nutritional indicators based on anthropometry viz., height, weight and Body Mass Index (BMI) and food habits which are characteristics of a condition in the system that are liable to change fairly slowly, while many variables identified under social status, economic status and responsibilities of the women could fluctuate widely. Certain salient observations made in this context are:

(i) Relationship between the variables listed under economic status and women's responsibilities and that between economic status and food habits were considered as unambiguous.

(ii) Variables identified under economic status and food habits were not the extensive factors for determining the nutritional status of fisherwomen.

(iii) Variables under economic status were found as factors responsible for indicating the development of health problems while, variables under responsibilities of women were found

FIG. 9 FACTORS INFLUENCING NUTRITIONAL STATUS OF FISHERWOMEN



responsible for accelerating the rate at which the health problems developed.

These types of findings may have only limited value in the nutritional study. However in planning interventions, such findings may help to prevent such situations.

5.6 In depth studies on the nutritional status of selected fisherwomen (15)

An in depth study was conducted to assess the nutritional status of the women through assessment of actual food and nutrient intake, anthropometric, clinical and bio-chemical studies. The kind and amount of food consumed affects the physical well being of an individual. Food is a prime necessity of life and the presence of essential nutrients in the food determines growth, health and efficiency of a population (Maxine and Sumati, 1973). Nutritional status of an individual depends on the provision of sufficient nutrients and its utilization. Poor nutritional status may be due to low intake of nutritious food and failures in digestion and absorption of food and utilization of nutrients from it.

5.6.1 Actual food and nutrient intake of fisherwomen

Food weighment survey revealed that the intake of various foods was not balanced or adequate. An adequate diet or balanced diet which provides all essential nutrients in sufficient

quantities and proper proportions is essential to meet the needs of the body. In the present study the intake of milk and milk products and animal foods is more than the recommended level for adult women doing moderate activity. Fish being the available protein food for them, its consumption rate was five time higher than RDA for animal food to be included in a balanced diet suggested by ICMR (1989). Fish was consumed daily and meat once in a week preferably on sunday. Pulses, green leafy vegetables, roots and tubers and fruits were rarely consumed by them. A study conducted in Cochin among fishermen community by Krishna (1988) revealed that their diet consisted mainly of rice and fish, and fruits and vegetables, which were rarely included in their diets. Same findings were observed by Dutta and Sharma (1978) in Tamil Nadu; (Anon., 1987) in Uttar Pradesh and Preet and Bhavana (1988) in Madhya Pradesh and according to the findings of the study, conducted in Madhya Pradesh, cereal based diets were deficient in fresh fruits, vegetables, meat, eggs and milk and milk products. The findings of the current study at Valiyaveli are in accordance with the above except in the case of meat and milk and milk products which are consumed in abundance.

Nutrient intake by the fisherwomen revealed that the diet was inadequate in calories, vitamins (retinol, thiamine, niacin, riboflavin and vitamin C) and minerals (calcium and iron). ICMR (1981) reported that an adequate diet or a balanced diet provided all the essential nutrients, in sufficient quantities and proper proportion to meet the needs of the body. Preet and Bhavana

(1988) reported that the diets of the mill workers of Hoshiarpur were deficient in energy, vitamin A, B_1, B_2 and C.Paramjit *et al.* (1983) also observed similar situation at Hoshiarpur village. Sadasivam *et al.* (1980) found that the deficiency of above vitamins could be uprooted by the inclusion of green leafy vegetables in the daily diet.

Working efficiency is related to the intake of calories. In this study, on an average of 89.00 per cent of the calorie requirement was met by the diet consumed by these women. mathew and Sarita (1989) noticed that nutritional composition of the diet showed that only 67.00 per cent of the calorie requirement was fulfilled in the case of female workers and low calorie intake was noticed in 93.33 per cent of the workers. In Punjab, the calorie consumption by the labour class was 84.70 per cent of the requirements (Paramjit *et al.*, 1983). Sadasivam *et al.* (1980) reported that calorie deficiency without protein deficiency identified among rural folk seemed to be due to the low consumption of fatty foods. Pandey *et al.* (1977) stated that deficient calorie intake was the main nutritional problem among farm families. The nutrient imbalance in their diet could be due to lack of knowledge on balanced diets and low purchasing power.

5.6.2 Relationship between actual food intake and selected socio-economic variables

Social and economic factors pertaining to the women workers have an impact on their health (Gupta, 1968). In the present study family size, family income and number of members employed in a family were negatively correlated with certain food items. A study conducted in Maharashtra, low food intake was observed in low income, large, labour class families (Paramjit *et al.*, 1983). Kumar *et al.* (1976) reported that family size had been shown to influence the nutrient intake of families of low socio-economic groups. Derby (1976) reported that among the various factors affecting the nutritional status of an individual, diet with its close association with socio-economic factors emerges as an important force of influence. As reported by Rajammal *et al.* (1980) there is an increasing awareness of the relationship between malnutrition and socio-economic factors.

5.6.3 Time expenditure pattern of the fisherwomen

Fisherwomen spent most of their time on fishvending. Besides fishvending they had to do all household activities including fetching water. For these activities they had to spend most of their time and energy. On an average these women spent about 9.30 hours for fishvending activities alone. John (1984) had also reported similar result about fisherwomen of Cochin coastal areas. Bannet (1987) revealed that women's total working

time was found to be 11 hours a day as compared to 3.30 hours for men. Choudary (1988) reported that 80.00 per cent of the working women had to work for 8 hours daily. According to Patel (1982) employed women carried more household responsibilities and had longer working hours and too long hours of work at home and outside the home. More over nutritional stress may act as an additional physical burden on these women. Saha and Kanchan (1991) reported that rural women spent maximum time for domestic work due to lack of proper fuel supply, cooking facilities, cleaning the utensils and also lack of modern living facilities. In Valiyaveli area, these women spent one hour 30 minutes to 2 hours 16 minutes for cooking alone. Instead of this they spent an an average time of one hour 54 minutes for their household activities and one hour two minutes for fetching water.

5.6.4 Energy consumption and expenditure pattern of the fisherwomen

Low energy consumption and high energy expenditure were observed among the fisherwomen surveyed. Negative energy balance was observed in all the women as their actual energy consumption and expenditure were compared. The energy deficit ranged from 6.60 to 14.65 per cent when compared to the RDA. Energy expenditure over and above the energy consumed ie., body stored energy utilized varied from 9.43 to 35.77 per cent. This might be due to their low food intake and heavy work schedule. A study conducted by Rajammal (1975) among women doing manual work

in building construction revealed that their food and energy intake were found to be below the allowance recommended by ICMR. Bilberg *et al.* (1980) reported that the reason for the negative energy balance in human is long time heavy work. Studies conducted in Trivandrum revealed that the energy consumption was very low and expenditure was high among majority of women working as farm labourers (Suja, 1989 and Laisamma, 1992) and women engaged in stone breaking (Sujatha, 1990). But a positive energy balance was observed by Florence (1989) in employed home makers in the same district. Pandey *et al.* (1977) stated that deficient calorie intake was the main nutritional problem among working women.

5.6.5 Fluctuations in energy expenditure of the fisherwomen

Total times spent on various activities by the fisherwomen can be divided into three categories, viz., domestic chores attended before leaving home for fishvending, fishvending and household work and leisure activities after the day's work. Wide the fluctuation in energy expenditure among the fisherwomen was observed.

The energy expended during fishvending was higher, when compared to the other two categories ranging from 772.16 to 1012 kilocalories. Fluctuation in energy expenditure was also higher for this period. It was also found that energy expenditure for early morning routine activities was lesser when compared to the domestic chores performed in the evening.

The energy expended by the women in the morning hours ranged from 298.80 to 425 kilocalories, while in evening hours the range was between 744.12 to 1012.16 kilocalories. Women who spent less energy during the morning were found the spent more in the evening.

The data reveals that major domestic chores were attended after completion of fishvending activities.

5.6.6 Bio-chemical study of blood constituents like haemoglobin, total protein, albumin and vitamin A

Most of the fisherwomen (66.67 per cent) were found to have their haemoglobin content below normal confirming that they were anaemic. Haemoglobin levels of mill workers, (Preet and Bhavana, 1988) women engaged in stone breaking, (Sujatha, 1990) and women agricultural labourers (Laisamma, 1992) were found to have haemoglobin level between 9.00 to 10.00 g/100 ml which were low when compared to the normal level of 14g/100 ml recommended by WHO. Vijayalakshmi *et al.*(1987) reported that severe anaemia impairs work capacity, learning ability and immune functions of the body. In a study conducted among employed home makers, 50.00 per cent of the women were found to have haemoglobin levels between 12.00 to 13.00 g/100ml (Florence, 1989). Felsy (1989) reported that 60.00 per cent of the Kanikkar tribal women of Amboori had haemoglobin levels below 12 g and hence were anaemic. The main reason for anaemia in the present

study area is their heavy schedule of work coupled with their inadequate intake of green leafy vegetables and other protective foods in the diets of the fisherwomen. NIN (1991) reported that availability of iron from the composite diet is more important than the individual foods because of profound interaction between foods influencing iron absorption.

Mean total protein and albumin content of serum of 66.67 and 46.67 per cent of women were slightly lower than normal. This indicates that even though their diets were rich in protein, a negative metabolic change due to depletion of body protein for energy purposes, might have occured. Low albumin content in the serum also Indicates similar changes even though clinical symptoms were not detected during clinical examination by a qualified physician Vijayalakshmi and Devaki (1976) reported that the total protein and albumin values were lower in the low income groups ie., 5.22 and 2.17 gm/100 ml.

Serum vitamin A level was very poor in fisherwomen. The lower level of vitamin A was due to the inadequate intake of green leafy vegetables and fruits. Rajammal *et al.* (1980) reported that serum vitamin A level of the expectant mothers in the low income groups was 18.00 ug/ 100 ml and it was below the normal values. Jayam (1984) reported that a considerable number of women and children suffered from partial blindness because of vitamin A deficiency among fisherfolk of Kanyakumari district. Mohiuddin (1989) noticed a general deficiency of vitamin A with

diseases like anaemia, scurvy and night blindness in villages of Uttar Pradesh.

From the above revelations it can be concluded that the fisherwomen experienced difficulties in carrying out their dual responsibilities at home and at work place. Due to alcoholism and ill treatment by their husbands, they family needs were met from the income of fisherwomen. As a result these women were undernourished and were over worked. Their food and nutrient intake were inadequate to meet their daily needs. Hence, the above factors adversely affected the nutritional status of the fisherwomen.

SUMMARY AND CONCLUSION

SUMMARY AND CONCLUSION

The present study was carried out to assess the nutritional status of women engaged in fishvending in Trivandrum district. It threw light on the socio-economic and food consumption pattern of the 150 fishermen families in Valiyaveli coastal areas of Trivandrum. Impact of time utilization and energy expenditure pattern of the fisherwomen, on their nutritional status was also ascertained.

Details of the survey showed that the majority of families were nuclear type observing patriarchal family system, headed by male members and believing in christianity. In most of the families family size ranged from 3 to 6 with more male members.

The main occupation of the community was fishing and in all the families women were engaged in fishvending. Many of the women of these families collected fish for vending from the local fish contractors or from major markets located in the city. Very few of the women sold fish from their own catch.

The main source of income of these families was fishing and fishvending. In addition to this, other adult members were earning income from other sources like business, government jobs, coolie and employment outside the country. Many of the families

had a monthly income range of Rs. 1000 to 2000. However many of the families resided in houses which were devoid of minimum facilities like kitchen, running water and latrines.

Expenditure pattern of the families was mainly based on their monthly income. Percentage of monthly expenditure on various items was found to decline as income increased. Depending upon their income, percentage of food expenditure varied from 39.65 to 66.60. Expenditure on education and health was very low. Personal expenditure was high for male members. They spent their income for their faulty habits like alcoholism and playing cards. Many families were in debts and about 7.77 per cent of the income was spent for repaying loans. Due to illegal habits of the male members women were responsible for the economic management of the families. Based on the selected socio-economic variables an index was developed to assess their quality of life. On the basis of this index all the families lived below the poverty line.

All the families were habitual non-vegetarians and rice was the staple food consumed by the families. Fish was the important non-vegetarian food included daily in their diet. About 43.20 to 66.58 per cent of the food expenditure was for the purchase of cereals. However, expenditure on food items like vegetables, pulses, eggs and green leafy vegetables was considerably less due to lack of knowledge of nutrition. Fish was taken for their daily diet from them the remainder after fishvending activities.

Socio-economic variables like, family size, family income, number of members employed in a family, age of the fisherwomen and their income were associated with the total expenditure on food items. Frequency of use of various food items revealed that food articles like rice, coconut, fish and sugar in beverages like coffee or tea were included daily in their diets. Either due to lack of knowledge or income, consumption of egg, pulses, green leafy vegetables and fruits were negligible.

A monotonous and imbalanced three meals a day pattern, composed of cereals and fish was observed among the families surveyed. Locally available nutritious foods like green leafy vegetables were absent in their diet. Diet given during special conditions revealed that adequate care was taken only during infancy and pre-school period, and during school going and adolescent periods only adult diets were given.

During pregnancy and lactation, no additional care was taken to nourish their daily diet. During illness, especially fever and diarrhoea solid food restriction was noticed among them.

The fisherwomen studied were in the age group of 26 to 50 years and were moderately educated. These women were responsible for dual work as housewives and as wage earners of the family. Compared to the household activities, more time was spent for fishvending activities. Various domestic works were combined

with fishvending activities due to inadequate time to do household activities properly. Total time spent for household and fishvending activities was more than 10 hours a day. A highly significant positive association was observed between fishvending activities and with variables like family income, age of the fisherwomen and their income.

Energy expenditure for different activities revealed that they spent their energy more for fishvending than for other activities. Total energy expenditure of these women was also higher than their requirements.

Health parameters like height, weight and Body Mass Index (BMI) were assessed. The majority of women were found to be below the ideal weight of 50 kg. recommended for a reference woman. Body Mass Index of these women revealed that 33.33 per cent of these women suffered from different degrees of energy deficiency.

Nutritional status index developed from the above health parameters for the fisherwomen ranged from 14.04 to 18.58. A highly significant positive association was observed in between nutritional status index of the women and their height, weight, Body Mass Index, index developed from socio-economic factors and energy expenditure. But no significant relationship was observed between the nutritional status index and the selected socio-economic variables.

Clinical observation of the fisherwomen revealed that 95.33 per cent of the women were suffering from one type of nutritional deficiency disorders, or other.

Results of the in depth studies on the actual food intake of selected fisherwomen (15) show inadequate and unbalanced consumption of food articles. Consumption rate of pulses, green leafy vegetables, roots and tubers, fruits and fats and oils was negligible and it was less than 20.00 per cent of the RDA. The intake of cereals was also less than the RDA (89.00 per cent) specification.

Mean nutrient intake of the fisherwomen revealed that availability of energy, fat, calcium, iron, retinol, thiamine, niacin, riboflavin and vitamin C were inadequate in their daily diets. But the intake of protein was found to be very high.

Biochemical analysis of the blood constituents revealed that 66.67 per cent of the women had low haemoglobin and total protein content and 46.67 per cent had low albumin content. Serum vitamin A was below the normal level of 25 µg in 86.67 per cent of the women. A comprehensive analysis of the data on socio-economic and nutritional problems faced by the women revealed that improving the work situation is highly essential to attain optimum nutritional status for these women. On the basis of the salient observations made in the study, following suggestions are made.

(i) Role and status of the women should be improved through better education on family life.

(ii) Efforts should be taken to educate the fisherwomen with regard to the fundamentals of nutrition, emphasizing the role of good nutrition to improve the health status.

(iii) Fishvending activity should be made less lethargic by introducing transportation facilities and by starting small markets at short distances.

(iv) Purchasing power of the women should be improved by increasing the income from fishvending and introducing supplementary occupations during the off seasons.

(v) Facilities for drying fish , storage and fish processing units in this area should be introduced so as to provide subsidiary occupations during off season.

(vi) Facilities for free medical care for women and children should be extended.

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APPENDICES

APPENDIX I

KERALA AGRICULTURAL UNIVERSITY

COLLEGE OF AGRICULTURE

DEPARTMENT OF HOME SCIENCE, VELLAYANI

INTERVIEW SCHEDULE TO ELICIT INFORMATION REGARDING THE ECOLOGICAL AND SOCIO - ECONOMIC PROFILE OF THE FISHERMEN FAMILIES OF TRIVANDRUM DISTRICT.

1. Name of the respondent :
2. Name of the head of the family :
3. Full address :
4. Religion :
5. Caste (Fishermen community) :
6. Type of the family :
7. Family system :
8. Family head :
9. Is there any dowry system prevailing in your community :
10. Family size :

10.1. Number of male adults above 18 years :

10.2. Number of female adults above 18 years :

10.3. Number of male children in between 16-18 years :

10.4. Number of female children in between 16-18 years :

10.5. Number of male children in between 13-15 years :

10.6. Number of female children in between
13-15 years :

10.7. Number of male children in between
10-12 years :

10.8. Number of female children in between
10-12 years :

10.9. Number of male children in between
7-9 years :

10.10. Number of female children in between
7-9 years :

10.11. Number of male children in between
4-6 years :

10.12. Number of female children in between
4-6 years :

10.13. Number of male children in between
1-3 years :

10.14. Number of female children in between
1-3 years :

10.15. Number of male children in between
6-12 months :

10.16. Number of female children in between
6-12 months :

10.17. Number of male children in between
0-6 months :

10.18. Number of female children in between
0-6 months :

11. Number of members employed in a family :

12. Details of family members who are employed in the family :

13. Main occupation taken up by the family members :

13.1. Fishing :

13.2. Fishvending :

13.3. Coolie :

13.4. Government job :

13.5. Business :

13.6. Employed outside the country :

13.7. Fishing and fishvending :

13.8. Fishing and coolie :

13.9. Fishvending and coolie :

14. If fishing is the major employment of your family how do you market the fish? :

15. Details of the job fishing :

16. Does the family have your own fishing equipment? :

16.1. Specify the type of equipment :

16.2. Specify how did you get the fishing equipment? :

17. Details regarding income of the family :

17.1. Income from regular employment :

17.2. Monthly income from land, domestic animals, farm production, business etc. :

17.3. Monthly income from other sources :

17.4. Monthly income from subsidiary occupation :

18. Total income of the family :

19. Details pertaining to the house :

20. Number of rooms :

21. Type of house :

22. Source of drinking water :

23. Person responsible for fetching water :

24. Monthly expenditure pattern of the family :

24.1. Expenditure on food :

24.2. Expenditure on clothing :

24.3. Expenditure on shelter :

24.4. Personal expenditure for head of the family :

24.5. Personal expenditure for respondent :

24.6. Personal expenditure for children :

24.7. Personal expenditure for other family members :

24.8. Expenditure on transport :

24.9. Expenditure on education for children :

24.10. Expenditure on news paper, magazines etc. :

24.11. Expenditure for health :

24.12. Expenditure on repairing and maintenance of fishing equipment :

24.13. Expenditure on fuel :

24.14. Expenditure on electricity :

24.15. Expenditure on ceremonies and festivals :

24.16. Expenditure on gift :

24.17. Expenditure on food outside home :

24.18. Expenditure on convenient foods :

24.19. Expenditure on repaying loans :

24.20. Expenditure on savings :

APPENDIX II

KERALA AGRICULTURAL UNIVERSITY

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DEPARTMENT OF HOME SCIENCE, VELLAYANI

INTERVIEW SCHEDULE TO ELICIT INFORMATION REGARDING THE FOOD CONSUMPTION PATTERN OF THE FISHERMEN FAMILIES OF TRIVANDRUM DISTRICT.

1. Name of respondent :
2. Food habit :
3. Name of the staple food :
4. Monthly food expenditure pattern of the family :

4.1. Cereals :
4.2. Pulses :
4.3. Green leafy vegetables :
4.4. Other vegetables :
4.5. Roots and tubers :
4.6. Fruits :
4.7. Nuts and oil seeds :
4.8. Milk and milk products :
4.9. Fats and oils :
4.10. Sugar and jaggery :
4.11. Egg :
4.12. Meat :
4.13. Fish :
4.14. Beverages :
4.15. Commercially prepared foods :

5. FREQUENCY OF THE USE OF VARIOUS FOODS

5.1. Cereals :

5.2. Pulses :

5.3. Green leafy vegetables :

5.4. Other vegetables :

5.5. Roots and tubers :

5.6. Fruits :

5.7. Nuts and oil seeds :

5.8. Milk :

5.9. Milk products :

5.10. Fats and oils :

5.11. Sugar and jaggery :

5.12. Egg :

5.13. Meat :

5.14. Fish :

5.15. Beverages :

5.16. Commercially prepared foods :

6. METHODS EMPLOYED FOR COOKING :

6.1. Cereals :

6.2. Pulses :

6.3. Green leafy vegetables :

6.4. Other vegetables :

6.5. Roots and tubers :

6.6. Flesh foods :

6.7. Egg :

6.8. Milk :

7. How do you use the excess water of the cooked foods? :

8. What are the types of cooking vessels used? :

9. How many times do your family members take foods daily? :

10. Does your family maintain specific time schedule for taking foods? :

11. DAILY MEAL PATTERN OF THE FAMILY

11.1. Early morning :

11.2. Break fast :

11.3. Lunch :

11.4. Dinner :

12. Special considerations in feeding family members :

13. Type of special foods given to them :

14. Meal serving pattern followed by the family :

15. Special foods prepared on special occasions :

16. Special foods given during special conditions :

16.1. Pregnancy :

16.2. Lactating period :

16.3. Infancy :

16.4. Pre-school :

16.5. Adolescent :

17. Food restriction given to sick person :

17.1. Fever :

17.2. Cold :

17.3. Diarrhoea :

17.4. Asthma :

APPENDIX III

KERALA AGRICULTURAL UNIVERSITY

COLLEGE OF AGRICULTURE

DEPARTMENT OF HOME SCIENCE, VELLAYANI

INTERVIEW SCHEDULE TO ELICIT INFORMATION REGARDING THE PERSONAL CHARACTERISTICS OF THE FISHERWOMEN OF TRIVANDRUM DISTRICT.

1. Name of respondent :
2. Age of the respondent :
3. Educational level of the respondent :
4. Marital status :
5. Age at marriage :
6. Type of marriage :
7. Details of dowry received during marriage :
8. Membership in any organization :
9. Support getting from the above organization :
10. Where do you sell the fish? :
11. What type of vehicles do you use for transporting fish? :
12. How far do you go for fishvending? :
13. How many kilometers do you walk for fishvending daily? :
14. Amount spent for buying fish daily? :
15. Average daily income from fishvending? :
16. What are the domestic works during, along with fishvending? :
17. How will you manage during rainy season when there is no fish? :

18. Frequency of taking foods in between work time

18.1. Coffee or tea :

18.2. Coffee or tea with snacks :

18.3. Fruit juices :

18.4. Coffee or tea with banana :

18.5. Banana :

18.6. Bakery products :

18.7. Yesterday's left over food :

19. When do you take your breakfast? :

20. What type of breakfast do you take? :

21. When do you take your lunch? :

22. What type of lunch do you take? :

23. When do you take your supper? :

24. What type of supper do you take? :

25. Upto what period do you go for fishvending during pregnancy? :

26. When will you go for fishvending after delivery? :

27. How do you manage your children while you are going for fishvending? :

APPENDIX IV

KERALA AGRICULTURAL UNIVERSITY

COLLEGE OF AGRICULTURE

DEPARTMENT OF HOME SCIENCE, VELLAYANI

INTERVIEW SCHEDULE TO ELICIT INFORMATION REGARDING THE TIME UTILIZATION PATTERN OF THE FISHERWOMEN OF TRIVANDRUM DISTRICT.

1. Name of the respondent :

DAILY TIME SCHEDULE OF THE FISHERWOMEN

2. When will you wake up in the morning? :
3. At what time do you go for fishvending? :
4. When will you come home after fishvending? :
5. Average time spent for household activities :
6. Average time spent for fishvending activities :
7. Average time spent for leisure activities and sleep :

APPENDIX V

KERALA AGRICULTURAL UNIVERSITY

COLLEGE OF AGRICULTURE

DEPARTMENT OF HOME SCIENCE, VELLAYANI

SCHEDULE USED FOR ASSESSING ANTHROPOMETRIC MEASUREMENTS AND CLINICAL SYMPTOMS OF THE FISHERWOMEN OF TRIVANDRUM DISTRICT.

1. Name of the respondent :
2. Age of the respondent :
3. Height :
4. Weight :
5. CLINICAL SYMPTOMS

1. Oedema :
2. Thin, sparse hair :
3. Dispigmentation of the hair :
4. Diffuse pigmentation of the skin :
5. Loss of ankle or knee jerks :
6. Spongy bleeding gums :
7. Epiphysal enlargement :
8. Conjunctival Xerosis :
9. Bitot's spot :
10. Cornial xerosis :
11. Night blindness :
12. Photophobia :
13. Phrynoderma :
14. Palpitation and breathlessness :
15. Angular stomatitis :
16. Glossitis :

17. Magenta tongue :

18. Osteomalacia :

19. Koilonychia :

20. Atrophic lingual papillae :

21. Anaemia :

22. Mottled enamel :

23. Dental caries :

24. Enlargement of thyroid :

25. No health problems :

APPENDIX VI

KERALA AGRICULTURAL UNIVERSITY

COLLEGE OF AGRICULTURE

DEPARTMENT OF HOME SCIENCE, VELLAYANI

SCHEDULE USED FOR ASSESSING THE ACTUAL FOOD INTAKE OF THE FISHERWOMEN OF TRIVANDRUM DISTRICT (BY FOOD WEIGHMENT METHOD).

Food consumption

Name of the meal	Menu	Weight of the total raw ingredients used by the family (g)	Weight of the total cooked food consumed by the family (g)	Amount of cooked food consumed by the respondent(g)	Raw equivalents used by the individuals (g)
Breakfast					
Lunch					
Tea					
Dinner					
Others					

APPENDIX VII

KERALA AGRICULTURAL UNIVERSITY

COLLEGE OF AGRICULTURE

DEPARTMENT OF HOME SCIENCE, VELLAYANI

INTERVIEW SCHEDULE TO ELICIT INFORMATION ON TIME UTILIZATION PATTERN FOR VARIOUS ACTIVITIES BY THE FISHERWOMEN OF TRIVANDRUM DISTRICT

Name of the respondent :

Time schedule of fisherwomen

Activities	Time spent Hr.	Min.
Personal care		
Cooking		
Other household work		
Fetching water		
Fishvending		
Household marketing		
Leisure activities		
Sleep.		

APPENDIX VIII

INDEX TO ASCERTAIN POVERTY LEVELS OF THE FISHERMEN FAMILIES (150)

SCORES OBTAINED.

Sl.No.	Index	Sl.No.	Index	Sl.No.	Index	Sl.No.	Index	Sl.No.	Index
1	18	24	16	47	15	70	30	93	24
2	16	25	9	48	18	71	25	94	21
3	20	26	16	49	16	72	19	95	26
4	26	27	16	50	18	73	21	96	14
5	20	28	20	51	17	74	14	97	17
6	22	29	19	52	17	75	17	98	20
7	21	30	21	53	18	76	11	99	19
8	17	31	17	54	17	77	15	100	17
9	24	32	17	55	19	78	17	101	18
10	18	33	12	56	22	79	17	102	10
11	19	34	25	57	22	80	15	103	15
12	14	35	19	58	19	81	17	104	20
13	15	36	18	59	18	82	14	105	16
14	22	37	18	60	19	83	17	106	17
15	20	38	18	61	14	84	19	107	14
16	22	39	25	62	13	85	19	108	17
17	19	40	22	63	20	86	12	109	21
18	19	41	16	64	18	87	22	110	15
19	20	42	18	65	18	88	24	111	18
20	22	43	19	66	14	89	13	112	15
21	10	44	19	67	18	90	17	113	18
22	16	45	19	68	25	91	12	114	16
23	17	46	18	69	20	92	8	115	12

Contd..

Sl.No.	Index	Sl.No.	Index	Sl.No.	Index	Sl.No.	Index	Sl.No.	Index
116	17	123	21	130	23	137	23	144	17
117	20	124	22	131	17	138	20	145	20
118	17	125	22	132	22	139	19	146	22
119	20	126	22	133	15	140	19	147	18
120	18	127	26	134	28	141	26	148	22
121	14	128	16	135	19	142	25	149	24
122	13	129	23	136	21	143	19	150	18

APPENDIX IX

TIME SPENT FOR HOUSEHOLD AND FISHVENDING ACTIVITIES BY THE FISHERWOMEN (150)

	Activities*							
Details of women	House-hold	Fish-vending	Details of women	House-hold	Fish-vending	Details of women	House-hold	Fish-vending
1	3,00	8,00	24	3,00	9,00	47	2,30	11,00
2	2,30	6,00	25	2,30	6,00	48	9,00	6,00
3	2,00	7,00	26	3,30	8,00	49	5,30	5,00
4	6,30	5,00	27	1,30	9,00	50	2,00	9,00
5	1,00	8,00	28	9,30	5,00	51	10,30	6,00
6	2,30	5,00	29	3,00	8,00	52	10,30	6,00
7	2,30	11,00	30	1,30	13,00	53	9,00	6,00
8	1,30	8,00	31	3,30	7,00	54	2,00	9,00
9	2,00	7,00	32	5,30	3,00	55	5,00	10,00
10	1,30	12,00	33	2,30	12,00	56	8,30	6,00
11	2,30	11,00	34	4,30	9,00	57	8,30	6,00
12	1,30	8,00	35	4,30	6,00	58	1,30	9,00
13	2,00	8,00	36	4,30	5,00	59	0,30	14,00
14	3,00	7,00	37	5,30	4,00	60	3,00	10,00
15	2,30	10,00	38	4,00	8,00	61	1,30	12,00
16	1,00	9,00	39	4,00	6,00	62	5,00	8,00
17	4,00	5,00	40	4,00	7,00	63	4,00	6,00
18	5,30	7,00	41	2,00	7,00	64	3,30	11,00
19	6,00	7,00	42	3,00	8,00	65	2,00	8,00
20	6,00	5,00	43	3,30	8,00	66	5,30	7,00
21	3,30	6,00	44	3,30	7,00	67	2,00	9,00
22	3,00	8,00	45	3,30	6,00	68	2,00	10,00
23	2,30	9,00	46	5,30	6,00	69	2,00	7,00

Contd..

70	2,30	9,00	97	2,00	6,00	124	1,30	8,00
71	2,30	14,00	98	2,30	8,00	125	1,30	3,00
72	4,00	11,00	99	2,00	8,00	126	1,30	8,00
73	9,30	6,00	100	2,00	9,00	127	2,30	11,00
74	4,30	7,00	101	2,30	8,00	128	1,30	11,00
75	5,00	5,00	102	2,30	8,00	129	3,00	11,00
76	5,30	5,00	103	1,30	10,00	130	2,00	12,00
77	2,00	8,00	104	2,00	8,00	131	2,00	9,00
78	2,00	8,00	105	2,30	8,00	132	2,30	11,00
79	7,00	8,00	106	2,30	8,00	133	2,00	9,00
80	3,30	4,00	107	3,00	8,00	134	2,30	13,00
81	3,30	12,00	108	1,30	9,00	135	2,00	9,00
82	5,00	5,00	109	1,30	7,00	136	1,30	9,00
83	4,00	5,00	110	2,00	8,00	137	2,00	13,00
84	4,30	4,00	111	4,00	9,00	138	1,30	13,00
85	4,00	7,00	112	1,30	8,00	139	2,00	8,00
86	4,00	4,00	113	8,00	8,00	140	1,30	10,00
87	4,30	11,00	114	2,00	6,00	141	2,30	13,00
88	3,30	12,00	115	2,30	9,00	142	2,00	13,00
89	2,00	8,00	116	2,30	8,00	143	1,30	10,00
90	4,00	6,00	117	2,00	10,00	144	1,30	10,00
91	2,30	8,00	118	2,00	9,00	145	3,30	11,00
92	4,00	6,00	119	2,30	8,00	146	2,00	11,00
93	5,30	4,00	120	1,30	8,00	147	2,30	11,00
94	2,30	7,00	121	2,00	9,00	148	3,30	9,00
95	3,00	12,00	122	2,00	9,00	149	1,30	8,00
96	4,00	7,00	123	1,30	11,00	150	3,30	10,00

* Activities are expressed in hours and minutes

APPENDIX X

TOTAL ENERGY EXPENDITURE PATTERN OF THE FISHERWOMEN (150)

Details of women	Energy expenditure (Kcal)	Details of women	Energy expenditure (Kcal)	Details of women	Energy expenditure (Kcal)	Details of women	Energy expenditure (Kcal)
1	2245	23	2379	45	2337	67	2483
2	2270	24	2317	46	2345	68	2611
3	2264	25	2097	47	2524	69	2428
4	2363	26	2282	48	2450	70	2560
5	2388	27	2300	49	2237	71	2731
6	2217	28	2330	50	2400	72	2553
7	2562	29	2361	51	2420	73	2878
8	2375	30	2686	52	2420	74	2479
9	2387	31	2314	53	2302	75	2171
10	2245	32	2223	54	2338	76	2275
11	2415	33	2615	55	2547	77	2431
12	2363	34	2509	56	2381	78	2342
13	2326	35	2087	57	2381	79	2347
14	2407	36	2162	58	2424	80	2160
15	2274	37	2150	59	2759	81	2536
16	2332	38	2333	60	2508	82	2165
17	2167	39	2208	61	2691	83	2152
18	2345	40	2365	62	2541	84	2134
19	2095	41	2313	63	2294	85	2264
20	2275	42	2273	64	2653	86	2177
21	2560	43	2490	65	2255	87	2724
22	2420	44	2396	66	2322	88	2635

Contd..

89	2372	105	2218	121	2450	137	2696
90	2294	106	2275	122	2675	138	2555
91	2382	107	2236	123	2537	139	2283
92	2124	108	2458	124	2420	140	2496
93	2097	109	2218	125	2621	141	2574
94	2190	110	2255	126	2420	142	2630
95	2721	111	2469	127	2430	143	2504
96	2146	112	2116	128	2412	144	2401
97	2145	113	2396	129	2630	145	2407
98	2382	114	2144	130	2669	146	2478
99	2431	115	2273	131	2400	147	2430
100	2400	116	2275	132	2620	148	2489
101	2264	117	2458	133	2400	149	2391
102	2264	118	2273	134	2706	150	2669
103	2266	119	2275	135	2400		
104	2342	120	2387	136	2447		

APPENDIX II

HEIGHT AND WEIGHT OF THE FISHERWOMEN (150)

Details of women	Height (cm)	Weight (kg)	Details of women	Height (cm)	Weight (kg)	Details of women	Height (cm)	Weight (kg)	Details of women	Height (cm)	Weight (kg)
1	150	41	24	148	41	47	154	45	70	156	54
2	160	46	25	146	35	48	152	49	71	160	46
3	145	37	26	146	39	49	151	45	72	153	44
4	155	49	27	146	38	50	153	45	73	153	49
5	152	40	28	154	48	51	161	47	74	155	54
6	142	39	29	152	45	52	159	48	75	150	42
7	161	50	30	152	46	53	151	41	76	154	44
8	143	39	31	153	44	54	158	42	77	155	49
9	150	41	32	153	44	55	159	48	78	153	44
10	147	40	33	153	47	56	153	48	79	149	39
11	153	46	34	154	48	57	158	47	80	152	40
12	150	40	35	157	50	58	150	46	81	151	41
13	144	40	36	149	40	59	159	49	82	155	40
14	154	48	37	154	50	60	153	48	83	150	40
15	154	41	38	152	42	61	155	51	84	149	42
16	146	41	39	148	41	62	149	39	85	150	41
17	137	38	40	156	47	63	151	46	86	146	39
18	144	44	41	155	48	64	154	46	87	159	54
19	150	36	42	146	39	65	148	40	88	153	45
20	154	47	43	157	51	66	150	42	89	155	45
21	156	39	44	153	50	67	163	50	90	157	45
22	154	49	45	155	51	68	158	54	91	154	46
23	147	43	46	152	50	69	156	52	92	157	35

Contd..

93	143	40	113	156	41	133	149	43
94	150	42	114	149	40	134	156	48
95	163	50	115	145	39	135	152	46
96	144	34	116	155	46	136	158	47
97	146	40	117	158	46	137	155	47
98	154	46	118	150	40	138	149	41
99	153	49	119	151	46	139	153	41
100	149	44	120	160	47	140	156	45
101	165	40	121	149	39	141	151	41
102	141	40	122	150	39	142	153	43
103	145	34	123	157	45	143	151	41
104	150	44	124	160	50	144	154	45
105	153	41	125	155	46	145	155	43
106	153	43	126	163	49	146	154	48
107	144	40	127	145	39	147	150	39
108	155	53	128	148	40	148	153	48
109	150	41	129	155	49	149	158	48
110	151	40	130	160	49	150	152	44
111	155	45	131	154	46			
112	151	39	132	153	49			

APPENDIX XII

BODY MASS INDEX (BMI) OF THE FISHERWOMEN(150)

Details of women	BMI	Details of women	BMI	Details of women	BMI	Details of women	BMI	Details of women	BMI	Details of women	BMI
1	18.22	26	18.31	51	18.14	76	18.56	101	14.70	126	18.42
2	17.96	27	17.84	52	18.97	77	20.41	102	20.00	127	18.57
3	17.61	28	20.25	53	17.98	78	18.80	103	16.19	128	18.26
4	20.20	29	19.48	54	16.87	79	17.57	104	19.56	129	20.42
5	17.31	30	19.91	55	18.97	80	17.39	105	17.52	130	19.14
6	19.50	31	18.80	56	20.51	81	17.98	106	18.38	131	19.41
7	19.69	32	18.80	57	18.88	82	16.67	107	19.32	132	20.94
8	15.05	33	20.09	58	20.44	83	17.78	108	22.08	133	19.37
9	18.00	34	20.25	59	19.37	84	18.92	109	18.22	134	19.75
10	18.51	35	20.33	60	20.51	85	17.78	110	17.54	135	19.91
11	19.65	36	18.02	61	21.25	86	18.31	111	18.75	136	18.80
12	17.77	37	21.10	62	17.68	87	21.34	112	17.10	137	19.58
13	19.32	38	18.61	63	20.18	88	19.23	113	16.87	138	18.47
14	20.04	39	18.72	64	19.40	89	18.75	114	18.01	139	17.52
15	17.29	40	19.34	65	21.50	90	18.29	115	18.57	140	18.52
16	18.25	41	20.00	66	18.67	91	19.41	116	19.16	141	17.98
17	20.21	42	18.31	67	18.87	92	14.23	117	18.40	142	18.38
18	21.25	43	20.73	68	22.80	93	19.61	118	17.78	143	17.98
19	16.00	44	21.37	69	21.40	94	18.67	119	20.18	144	18.98
20	19.83	45	21.25	70	22.22	95	18.80	120	18.36	145	17.92
21	16.05	46	21.64	71	17.97	96	16.43	121	17.57	146	20.25
22	20.68	47	19.00	72	18.80	97	18.78	122	17.33	147	17.33
23	19.91	48	20.68	73	23.07	98	19.41	123	18.29	148	20.51
24	18.72	49	19.74	74	22.50	99	20.94	124	19.53	149	19.20
25	16.43	50	19.23	75	18.67	100	19.80	125	19.17	150	19.05

APPENXIX XIII

NUTRITIONAL STATUS INDEX (NSI) OF THE FISHERWOMEN (150)

Details of women	NSI	Details of women	NSI	Details of women	NSI	Details of women	NSI	Details of women	NSI	Details of women	NSI
1	15.67	26	15.43	51	16.42	76	16.13	101	14.92	126	16.72
2	16.25	27	15.12	52	16.70	77	19.44	102	15.91	127	15.48
3	15.01	28	16.97	53	15.62	78	16.17	103	14.32	128	15.55
4	17.05	29	16.44	54	15.55	79	15.27	104	16.33	129	17.13
5	15.36	30	16.66	55	16.70	80	15.39	105	15.53	130	16.86
6	15.71	31	16.17	56	17.03	81	15.62	106	15.96	131	16.55
7	17.22	32	16.17	57	16.57	82	15.24	107	15.78	132	17.25
8	14.04	33	16.82	58	16.77	83	15.45	108	17.97	133	16.17
9	15.58	34	16.97	59	16.91	84	15.94	109	15.67	134	16.87
10	15.60	35	17.24	60	17.03	85	15.50	110	15.40	135	16.65
11	16.60	36	15.50	61	17.55	86	15.43	111	16.29	136	16.41
12	15.45	37	17.41	62	15.32	87	17.91	112	15.18	137	16.71
13	15.78	38	16.01	63	16.72	88	16.38	113	15.41	138	15.72
14	16.89	39	15.77	64	16.54	89	16.29	114	15.49	139	15.53
15	15.49	40	16.66	65	16.79	90	16.20	115	15.48	140	16.25
16	15.50	41	16.92	66	15.89	91	16.55	116	16.49	141	15.62
17	15.71	42	15.43	67	16.94	92	14.14	117	16.34	142	15.96
18	16.72	43	17.44	68	18.58	93	15.85	118	15.45	143	15.62
19	14.57	44	17.46	69	17.70	94	15.89	119	16.72	144	16.34
20	16.76	45	17.55	70	18.12	95	16.91	120	16.46	145	15.87
21	15.00	46	17.52	71	16.26	96	14.37	121	15.27	146	16.97
22	17.19	47	16.34	72	16.17	97	15.66	122	15.23	147	15.32
23	16.29	48	17.10	73	18.07	98	16.55	123	16.20	148	17.03
24	15.77	49	16.50	74	18.18	99	17.25	124	17.06	149	16.75
25	14.51	50	16.39	75	15.89	100	16.38	125	16.50	150	16.23

APPENDIX XIV

ACTUAL FOOD INTAKE OF THE FISHERWOMEN (15)

Food items	Details of women														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Cereals	325	305	316	289	325	317	296	308	323	326	205	300	317	305	316
Pulses	10	—	—	20	—	10	—	—	—	—	—	25	—	—	—
Green leafy vegetables	—	—	—	—	—	—	—	17	—	—	—	25	—	—	—
Other vegetables	30	—	—	—	20	—	—	—	—	—	—	—	—	30	—
Roots and tubers	60	—	—	55	—	—	—	30	—	—	—	—	30	—	—
Milk and milk products	110	105	110	120	100	110	100	100	110	130	100	150	110	105	90
Fruits	—	25	—	—	—	25	—	—	—	—	—	—	—	—	—
Nuts and oil seeds	33	25	31	40	25	29	32	28	31	33	29	42	25	32	30
Fats and oils	10	15	10	15	—	—	—	—	—	—	—	—	10	—	—
Meat and fish	128	143	158	125	145	130	128	149	110	133	140	125	135	130	150
Egg	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sugar and jaggery	40	35	42	43	50	42	35	30	35	35	25	28	30	28	35

APPENDIX XV

ACTUAL NUTRIENT INTAKE OF THE FISHERWOMEN(15)

Nutrients	Details of women														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Energy (Kcal)	1990	1985	1929	1987	1989	1985	1887	1899	1996	2004	1976	1996	1985	2012	2078
Protein (g)	59.69	57.75	59.85	52.17	60.13	57.88	59.35	51.54	52.78	59.28	60.29	59.54	58.13	63.54	59.95
Fat (g)	4.38	4.45	4.00	3.12	5.18	7.74	3.10	3.98	5.19	4.50	3.99	5.01	3.18	4.10	4.08
Calcium (mg)	221.00	251.00	239.00	257.00	352.00	287.00	342.00	255.00	370.00	265.00	283.00	341.00	289.00	333.00	356.00
Iron (mg)	18.54	17.08	18.01	19.03	16.04	19.44	17.83	18.41	17.53	18.36	16.49	18.91	18.56	17.99	17.78
Retinol (mg)	367.08	471.75	483.01	394.51	173.09	184.16	150.49	88.73	121.54	174.51	159.73	219.91	111.54	294.54	119.01
Thiamine (mg)	0.73	0.69	0.84	0.60	0.40	0.81	0.59	0.89	0.79	0.69	0.59	0.88	0.54	0.62	0.52
Niacin (mg)	9.35	8.99	6.98	8.54	10.53	9.59	10.04	10.53	10.92	8.98	10.54	10.58	10.20	10.82	10.11
Riboflavin (mg)	0.29	0.39	0.28	0.29	0.31	0.32	0.35	0.30	0.32	0.38	0.34	0.35	0.32	0.28	0.29
Vitamin C (mg)	20.30	18.91	22.43	19.38	18.75	21.20	21.10	21.52	22.24	22.20	20.91	21.92	22.18	21.73	24.43

APPENDIX XVI

DAILY ACTIVITIES OF THE FISHERWOMEN (15)

Activities*	Details of women														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Personal care	0,45	1,00	0,50	1,10	0,40	0,35	0,30	0,25	1,15	1,00	0,45	1,15	0,30	1,10	0,50
Cooking	1,45	2,00	2,15	2,30	1,45	1,30	1,40	2,00	2,30	2,15	2,00	2,30	2,00	2,15	2,30
Other household activities	2,10	2,10	2,05	2,15	2,10	1,55	1,35	1,35	1,60	2,00	1,60	1,33	1,30	2,05	1,35
Fetching water	0,45	1,00	1,10	1,15	1,00	1,15	1,20	1,00	1,15	0,45	1,20	1,10	0,45	0,45	0,40
Fishvending activities	8,35	7,30	8,35	7,20	10,30	8,00	11,25	11,15	10,00	8,30	8,55	9,45	10,45	9,10	9,30
Household purchase	1,00	1,15	0,40	0,30	0,30	1,00	0,45	0,30	1,00	0,35	1,00	0,45	0,30	0,40	0,30
Leisure activities	1,30	1,00	1,00	1,30	1,15	1,30	—	0,30	—	1,30	1,30	0,45	0,30	0,45	0,45
Sleep	7,30	8,05	7,25	7,30	6,20	8,15	6,45	6,55	6,00	7,25	6,30	6,15	7,30	7,00	7,40

*Activities are expressed in hours and minutes

APPENDIX XVII

CONSTITUENTS PRESENT IN BLOOD COLLECTED FROM THE FISHERWOMEN (15)

Details of women	Blood constituents			
	Haemoglobin(g)	Total protein (g)	Albumin (g)	Vitamin A (µg)
1	12.88	6.11	3.94	20.83
2	14.00	6.66	4.11	24.16
3	12.62	6.25	3.94	25.00
4	11.48	5.97	3.85	24.16
5	12.72	6.66	4.38	20.83
6	11.76	5.42	3.76	20.00
7	13.44	6.80	4.38	25.00
8	11.32	5.97	3.76	21.60
9	12.62	5.83	3.94	18.30
10	13.16	7.05	4.29	19.10
11	12.88	6.38	4.03	18.30
12	12.62	6.38	4.11	16.60
13	13.44	6.11	4.00	20.83
14	13.16	6.90	4.20	21.60
15	11.20	5.69	3.60	19.10

NUTRITIONAL STATUS OF WOMEN ENGAGED IN FISHVENDING IN TRIVANDRUM DISTRICT

BY

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ABSTRACT OF THE THESIS
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ABSTRACT

The study on the " Nutritional status of women engaged in fishvending in Trivandrum District" comprises of the socio-economic and food consumption pattern of the fisherwomen families with special reference to their actual food intake, energy expenditure and nutritional status.

Families surveyed were nuclear type belonging to under privileged communities. Main occupation of the families was fishing and fishvending. Most of the families belonged to the income groups of Rs.1000 to 2000.

In these families as the income increased the percentage of income spent on food items decreased. Expenditure on education and health was very low. Male members spent much money for their faulty habits like alcoholism and playing cards. Most of the families were in debts and only women were responsible for the economic management of the families.

Index developed from various socio-economic variables revealed that all the families lived below the poverty line.

All the families were non-vegetarians and fish was the main nonvegetarian food in their diet. However, consumption of vegetables, pulses, eggs and green leafy vegetables was less due to lack of knowledge about nutritious food. Preparation of food is not upto the standard and this results in the poor quality of the food.

Unbalanced, monotonous meal pattern was observed in this community. Compared to other stages of life, special attention was given only during infancy and pre-school period.

Besides fishvending women were responsible for household tasks and child care practices. The women got employment for 7 months in a year. Most of the women sold the fish either in the markets in the city or by home to home delivery. Income getting from fishvending was not in proportion to the distance covered.

Time spent for fishvending activity was more than the time they spent for other activities. Most of the household activities were combined with fishvending activities. It was found that total time spent for fishvending and household activities was more than 10 hours in a day. Time spent for fishvending activities was positively associated with family income, age of the fisherwomen and income of the fisherwomen.

Compared to Recommended Daily Allowance, higher energy expenditure was noticed in all the fisherwomen studied.

Majority of the women were below the normal weight. Body Mass Index of the women showed that 33.33 per cent suffered from energy deficiency. Nutritional status index was developed from height, weight and Body Mass Index. The index developed ranged from 14.04 to 18.58. A highly significant positive association

was observed in between nutritional status index of the women and their height, weight, BMI, index developed from socio-economic factors and their energy expenditure.

Clinical examination of the fisherwomen revealed that 95.33 per cent of the women were suffering from any one of the nutritional deficiency disorders.

Consumption of food quantity and availability of nutrients from the food were not satisfactory. The nutrients like energy, calcium, iron, retinol, thiamine niacin and riboflavin and vitamin C were deficient in their diets. As a result nutritional deficiency symptoms were more prevalent among them. Energy expenditure was more than the intake of energy. Blood constituents like haemoglobin, total protein, albumin and vitamin A were deficient in many of the women studied.

From the above findings it was concluded that the nutritional status of the fisherwomen was found to be affected by geographic, environmental and disease factors.