# FOOD CONSUMPTION AND ENERGY EXPENDITURE PATTERN OF AGRICULTURAL LABOURERS OF TRIVANDRUM DISTRICT

By

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## DECLARATION

I hereby declare that this thesis entitled **"Food consumption and energy expenditure pattern of agricultural labourers of 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 award to me of any degree, diploma, associateship, fellowship or other similar title, of any other University or Society

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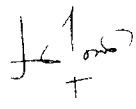
## CERTIFICATE

Certified that this thesis entitled **"Food consumption and energy expenditure pattern of agricultural labourers of Trivandrum District"** is a record of research work done independently by **Smt. LAISAMMA CHERIAN** under my guidance and supervision and that it has not previously formed the basis for the award of any degree, diploma, fellowship or associateship to her



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# Introduction

## INTRODUCTION

In a developing country like India, the growth of national economy depends on the primary sector, namely the agriculture Agriculture forms the mainstay of people and in India, 75 per cent of the population are engaged in agricultural related operations In Kerala, 42 0 per cent of the population depends upon agriculture for their livelihood (India - reference manual 1990)

An agricultural labourer can be defined, as a person who is consideration of the wages payable to him by a land owner, works on or does any other agricultural operation in relation to the agricultural land of such land owner (Government of Kerala 1976) Recent studies and research work ha revealed that, problems relating to agriculture and agricultural labourers are more than in any other segments Seasonal unemployment and under employment was the biggest problem faced by the agricultural labourers (Sentilathan, 1991) There was a seasonal difference in diet diversity observed among agricultural labourers, as reported by Greb (1990)

The work of the agricultural labourers being seasonal, it provides an improper food purchasing pattern Earlier studies had reported that, due to inadequate food consumption - increased level of work and slow growth influences the energy expenditure of a labourer (Wood and Capstick, 1928)

Compared to female agricultural labourers, better nutritional status was observed among male agricultural labourers (Sundararaj and Sheela 1970) This is mainly due to the occupational hazards faced by the women labourers at the workplace as well as in the domestic front Saikia and Gogoi (1982) have indicated that, in India, one fifth of the total labour of a family comes from women, and one third of the women labour of the family was engaged in agriculture More over research workers and other agencies have not much focussed a comparative study between male and female agricultural labourers

In Kerala, 16 per cent of the female population are engaged in outside occupation of which, 37 48 per cent are in agriculture (1981 census report) However data related to their nutritional status, occupational hazards, personal characteristics and food consumption pattern are scanty Hence the present study was undertaken with the following objectives

(1) To assess the food consumption pattern of the agricultural labourers
(2) To determine their daily energy expenditure pattern
(3) To assess their nutritional status
(4) To locate the problems and occupational hazards faced by the agricultural labourers

# Review of Literature

# REVIEW OF LITERATURE

The health and welfare of agricultural labourers is important because of the influence of these parameters on their working efficiency Earlier studies conducted by nutritionists and social scientists are reviewed in this chapter under the following headings

1 Socio-economic conditions of agricultural labourers

2 Food consumption pattern of agricultural labourers

3 Energy consumption and energy expenditure pattern of the agricultural labourers

4 Nutritional status of agricultural labourers

5 Role of male and female labourers in the development of agriculture

6 Specific problems faced by female agricultu al labourers

## Socio-economic conditions of agricultural labourers

Agricultural labourers are identified under the low income segments of the population in our country Studies conducted by Venkataswamy (1975) and Ratnam Nadar (1981) among Tamil Nadu agricultural labourers revealed that, agricultural labourers were living under conditions of abject poverty and disguised unemployment According to their surveys, illiteracy and ignorance had contributed to the low income and consequent poverty of these labourers Nata Rajan (1978) had reported that the largest percentage of poverty

among agricultural labourers in 4 states viz Tamil Nadu, Orissa, Madhya Pradesh and Kerala According to the findings of this author, agricultural labourers in Punjab and Himachal Pradesh are in better economic status than their counterparts of these four states

On the basis of the studies conducted among agricultural labourers, Bernardo et al (1989) had inferred that, there are socio-economic manifestation of malnutrition which was perceived from low productivity, low capacity and lack of interest They had also reported that, low income would result in decrease in agricultural production and would led to lower consumption of food and more severe malnutrition creating a viscious and spiralling cycle which would continue to get worse

Dantawala et al (1986) had reported that female wages as a percentage of male wages at the all India level had been less than 70 0 per cent of male wages in all labour enquiries Jose (1988) in his study on agricultural wages in India had found that, female wage remained at less than 80 0 pe cent of the male wage rate in 10 States over the period, and in 3 States it rarely exceeded 65-70 per cent Lalitha and Sharadha (1989) conducted a study on socio-economic and living conditions of farm labourers and reported that the major source of income was from agricultural wages

Alan Berg (1973) had reported that higher wages and more working days had increased the income and nutritional status of landless labourers, who were usually at the bottom of the income ladder in India A survey conducted by Indian-National Sample Survey Organisation (1983) had revealed that, the average days of employment available to adult males from agricultural labour were 255 days It was further revealed that, for adult female labourer, employment day available were 201 days Jayasankar and Venkat Narayanan (1983) conducted a case study among labourers engaged in agricultural activities and revealed that a labourer on an average would get 258 days of employment in a year

According to Ghosh (1980), the daily wage rate implicit in the annual wage of an agricultural labourer was determined probably on the basis of a subsistence ration, and operated as the norm for fixing the minimum daily wage of casual labourer He had further said that, during busy periods, the casual labourer market reached a full employment equilibrium and the wage rate rose above the minimum level

A study conducted by UNRISD (1974) revealed that the new technology led to an increase in the use of human labour per unit of land and to a decrease in human labour input per unit of production A survey conducted by Lal (1976) had revealed that, the real wages in agriculture was highest in States such as Kerala and West Bengal He had further stated that increase in wage was associated

with the widespread introduction of the new technology Mishra (1988) had conducted a study in Uttar Pradesh and revealed that the spread of technological change had been spatially uneven and rising wage effects had gradually declined during that period

But according to Mishra (1988), there was no direct casual relationship between technological change and agricultural wages Agarwal (1980) had reported that, wages of agricultural labourers were influenced by busy agricultural seasons

Jayasankar and Venkata Narayanan (1983) found that casual labourers on piece rates received Rs 8 to 12/day They had further reported that Minimum Wages Act for agricultural labourers had not yet been implemented A survey conducted by India National Sample Survey Organisation (1983) had revealed that average earnings per day for the agricultural operation was Rs 2 75 for males and Rs 1 58 for females

Patel (1982) had reported that, women's level of wages and their low skills were the natural consequences of their biological condition The operationwise difference in agricultural wages as analysed by Dantawala et al (1986), had revealed that operations performed mainly by women such as transplanting or weeding merit lower wages than those performed mainly by men

According to Chattopadhyay (1986), male labourers were reported to get higher wage rates than the female labourer for

the reason that these two categories of labourers usually did not supply the same labour commodity. Satyanarayana et al (1980) had reported that the wages earned by agricultural labourers were found to be directly related to body weight and this association remained significant evenafter partialling out the influence of age

**Food consumption pattern of the agricultural labourers**

The food consumption pattern of agricultural labourers were subjected to considerable seasonal fluctuations Individuals employed in agriculture showed the most marked seasonal variation in consumption of food According to Niedzialet (1983), the seasonal nature of consumption was one of the causes of the poor nutrition among these populations

According to Devadas and Easwaran (1980) religion, injunctions, superstitions and ignorance had affected the food habits significantly According to Rao et al (1986), the effect of age, sex and institutional input on the knowledge of nutrition was not significant in influencing the food habits

Richard and Longhurst (1983) had reported that, the seasonality of agricultural production, food availability and malnutrition had indicated that production and consumption did not coincide and that planning for aggregate production was not sufficient to meet consumption objectives Devadas and Easwaran (1986) had

opined that, food habits of the people depended on availability of foods Food availability was observed to be influenced by the climate, socio-economic and cultural environment According to Sundararaj and Sheela (1970), the dietary intakes of the rural males had not changed significantly

Aujla et al (1983) had opined that, families of agricultural labourers were malnourished basically due to inadequate income Purchasing power is a major determinent of food intake (Rao, 1979) Panicker (1979) had reported that, flood, unemployment and economic distress, widespread mobility acted as a cumulative results drifting into heavy debt and these adverse circumstances affected the level of food intake

Agarwal (1980) had reported that, the income and consumption of rural population was lower than the minimum requirements of physical sustenance of healthy living Indian National Sample Survey results had revealed that the consumption expenditure of the rural households exceeded household income resulting in about 50 0 per cent of household being debted (1983)

Alan Berg (1973) had observed that, income was a major determinant of quantity and quality of diet He had observed that in South India, the poorest families had spent 80 0 per cent of their budget on food while the affluent only 45 0 per cent

Devadas and Easwaran (1986) had found that the staple food item mainly rice and other millets dominated the food expenditure pattern of poor households in Tamil Nadu The family food intake was based on the wages received for the day and food materials available in the market The author had further reported that, food was cooked only once in the largest families

Thimmayamma and Rao (1981) had conducted a dietary survey and found that, in poor households, except staples (ie rice, wheat and millet) and few spiced food items like pulses, vegetables, oils etc were not usually available at home and they were usually purchased from local shop just before cooking

Devadas et al (1965) had observed that, milk consumption was very low in the families of agricultural labourers The consumption of meat, milk, fruits and green vegetables had increased with increase in income Honda et al (1972) had observed, that standard daily intake of meat and poultry, fats and oils and sugar were insufficient in the diets of the men and milk and milk products, fats and oils, fruit and sugar were low in the diets of the women

Lewandiowsker et al (1988) had reported that the nutritive value of daily peasant household diet was higher than that experienced by other social groups

**Energy consumption and energy expenditure pattern of the agricultural labourers**

Sathyanarayanan et al (1979) has reported that nutrition and food intake were closely related to the efficiency and productivity of workers Overall energy expenditure on body depend on levels of activity, growth, body composition, diet and metabolic characteristics Kleiber (1961) had found that the energy expenditure is measured as Basal Metabolia Rate (BMR) and is found to vary with body weight in a fairly predictable way

According to Wood and Capstick (1928) low food intake, would result in reduction in unnecessary exertion According to Ramamurthy and Belavady (1966), there was a wide variation in the energy expended for the same activity between different subjects when expressed per kilogram body weight but the energy expended per unit time of activity showed less variation They had further found that, the energy expenditure for agricultural labour was about 3000 Kcal

Devadas el al (1974 and 1977) had found that poor agricultural workers had a high seasonal energy expenditure Longhurt (1984) had also reported the same view According to Devadas et al (1974), energy expenditure of Indians on various activities were meagre

According to Tandon et al (1975), there was no correlation between work output and energy intake They had reported that, reduced levels of output observed for some labourers were significantly correlated with anaemia Vijayalakshmi and Selvasundari (1983) had found that, work capacity was found to increase due to iron supplementation Vijayalakshmi et al (1987) had also reported the same view

Arnold et al (1985) had reported that during dry season there was little work to be done They had further reported that the male agricultural labourers in particular had a very little sedentary life style and their expenditure dropped sharply Alan Berg (1973) had reported that demands on human physical energy output decreased as the proportion of the work force in agriculture declined

The mean daily energy expenditure of the labourers was observed to be 2451-3610 Kcal in Upper Volta during dry and rainy season as reported by Bleiberg et al (1980) They had further reported that much less energy in the range of 2010-2690 Kcal/ day was expended during the dry season when daily activities were mostly domestic tasks

Krumdick (1971) has reported various nutritional problems among agricultural labourers According to Reutlinger and Selowsky (1976), the incidence of malnutrition among agricultural labourers in rural areas were less than among urban dwellers

According to Premakumari et al (1986) and Bernardo et al (1989), a low food intake reduced the physical capacity to work and increased the extent of fatigue, accident rate, sickness and absenteeism Poor nutritional status was reported to result in low adolescent body weight and work capacity by Satyanarayana et al (1980)

**Nutritional status of agricultural labourers**

Nutritional status was the condition of health as it was related to the use of food by the body (Robinson, 1975) According to Alan Berg (1973), there was a powerful influence of income and agriculture on nutritional status He had further reported that, economic, educational and other opportunities also influenced the nutritional status According too Thimmayamma (1983), large family size resulted in improper food distribution among family members of agricultural labourers mainly due to low purchasing power and faulty food habits influencing the nutritional status of family members Similar opinions were expressed about rural populations by Kumar et al (1976), Sreenath et al (1978), Aujla et al (1983) and Omideyi (1988)

Bernardo et al (1989) had reported that, causes of malnutrition may be due to economic, political and social factors Swaminathan (1986) had opined that, one of the important causes of malnutrition among agricultural workers was low purchasing power

due to inadequate income According to Suiter and Hunter (1980), nutritional status was influenced by factors such as psychological and also by thoughts, beliefs and emotions

A study conducted by Swaminathan (1986) in Japan on two groups of farmers showed that one group consuming a diet providing adequate amounts of all nutrients maintained good health and worked for 10 years longer than the other groups whose diets were poor and lacked in different nutrients He had also reported that latter group suffered from lack of muscle strength, nervous and metabolic disorders According to Aujla et al (1983), hunger and malnutrition sap energy and slow minds

Bardley (1981) had observed seasonal peaks of infection coincide with times of food storage and hard work, the consequences of malnutrition may be compounded and these had strong interaction with nutrition Among the nutritional diseases, iron deficiency anemia was a major concern in many developing countries as revealed by Vijayalakshmi et al (1987) Ozorio (1984) had reported that 230 million women in third world suffered from nutritional anaemia and this mild or moderate anaemia might impair well being, reduce maximal work capacity and adversely affect work performance According to Patel (1982), two-third of Asian women were perpetually undernourished and a majority were suffering from anaemia

Anaemia had a profound effect on health, it lowered resistance to fatigue and disease and affected working capacity In a report published by WHO (1984) it was said that, iron deficiency anaemia affected large number of women belonged to low socio-economic groups in Latin America It was also said that nutritional anaemia was widespread among women of child bearing age and contributed significantly to maternal morbidity and mortality

According to Vijayalakshmi and Selvasundari (1983), iron deficiency anaemia affected the physical capacity by reducing the availability of oxygen to the tissues which inturn affected cardiac output and the heart eventually leading to death in severe cases Tandon et al. (1975) had reported that even a superficial account of one type of anaemia led to notice other causes apart from deficient food intake

According to Swaminathan (1986), clinical examination was the most important part of nutritional assessment to get direct information of signs and symptoms of dietary deficiencies prevalent among people. Daniel (1977) had listed out encepalopathies, beriberi, pellagra, anaemia, scurvy and other hypovitaminosis as clinical symptoms prevalent very often among labourers especially if they are alcoholics Among the various nutritional disorders, Wernickekorsa Koff's encepalopathy was reported to be the most common one and the important symptoms of this disease were mental disorientation, failure of memory, ataxia of gait and paralysis of the eye nerves

Ishigro et al (1970) had conducted a study among Japanese farmers and found that during before and after busy season, there was change in serum protein and specific gravity of blood The fall in serum protein was reported to be in globulin especially $\alpha$-globulin Erber et al (1972) had estimated serum and plasma from 8 insect control workers during spraying seasons and 9 agricultural workers operating organophosphorus derivative sprays for one season and found that none showed clinical symptoms of poisoning but latent intoxication in these groups was detected by low blood enzyme and vitamin A values

According to Frisvold et al (1988) lack of field sanitation on agricultural job sites was reported to increase the possibility of agricultural workers with gastro intestinal disorders by 60 0 per cent According to Bilewiski and Sulimski (1987), the emission of sulphur dioxide, nitric oxide and other chemicals into the atmosphere through fertilizer and pesticide usage was endangering the health and environment of rural households According to Sakala (1987), four major occupational hazards were caused by pesticides, sun, injuries and poor field sanitation.

Pokarel and Shivakali (1986) had reported that, agricultural wage labourers had not received due consideration in the planning and execution of development programmes Jollam (1983) had opined that the occupational hazards of farming like farm accidents and pollution risks contributed to national physical, mental and social health other than through food supplies

Use of chemicals for agricultural work had also become frequently hazardous to women's health as reported in a review published by Women and the New International Order (1980)

**Role of male and female labourers in the development of agriculture**

Changes in the agricultural labour force and its composition are largely influenced by the female component of labour force as reported by Dantawala et al (1986) Saikia and Srikula Gogoi (1981) had opined that, women discovered crop husbandry in the Neolithic period and had been taking active part in agriculture They had further reported that, even in the present day world, women's role in agriculture was not less important than men's

A survey of 300 female agricultural labourers in Haryana State revealed that, almost all the dairy cattle work and agricultural activities such as transplanting crops, weeding, hoeing, picking, harvesting and threshing were done by women (Sardana et al , 1989) A number of studies conducted in India and elsewhere had revealed that women were seen to predominate in food cropping, subsistence agriculture and hoe cultivation while men controlled commercial and/or mechanised or plough cultivation (Thangamani, (1971), Jhurani, (1985), Devadas, (1975); Deepali, 1979); Bleiberg et al , (1980), Chaney and Lewis, (1980), Deepali et al , (1981), Meneber, 1983, Sirshi, (1985); Chattopadhyay, (1986); Chandra, 1988) and Pandey et al , 1988)

A study of male and female differences in time allocation and work load conducted by Adekanya (1988) indicated that, women had longer hours of work and shorter hours of sleep and rest According to him, the women spent more time than men on home related activities, besides their outside work Dak et al (1986) had reported that, nearly half of the agricultural activities considered, women were playing a monopolizing or dominating role and in many others supportive roles

According to Prikrylova and Kohn (1979), the differences which still existed between male and female labourers could be accounted for the less favourable work pattern and opportunity for doing fewer skilled jobs for women Kodhandram (1983) had reported that, many of the women engaged in agricultural activities depended on second crop and for the rest of the year (8 to 9 months), she was thrown out of occupation Pandey (1988) had reported that, the percentage of women to total family members employed in the farm was found to be decreasing According to Chandhra (1988) among female agricultural labourers, the percentage of women who worked as casual labourers were of higher percentage than men Chen (1988) had also reported similar findings According to Chen, agricultural labour available for women were mainly on casual daily basis or only in seasons or in annual contracts and faced greater unemployment rates than men He further said that in the hill region and tribal belts, there was a very low demand

for wage labour of women. According to Chattopadhyay (1986) a large proportion of rural female workers was engaged in agriculture than male workers

According to Agarwal (1980), in the villages of Uttar Pradesh, the rural folks remained occupied only during the busy agricultural seasons and due to little of non-agricultural activities, these people remained out of job during the lean seasons

Dantawala et al (1986) had reported that, female participation rates in general for agricultural activities were reported to be higher than the male participation rates in the rural areas than in the urban areas They had also observed higher female participation rates in the predominantly rice and millet growing States and lower in the wheat growing States

**Specific problems faced by female agricultural labourers**

In a report published by Lutheran World Foundation (1980) it was pointed out that, women had performed specific roles such as "food gatherers, food makers and food distributors" from ancient time onwards As per the New International Economic Order (1980) reported that, social and political status of the women directly linked to their economic status

and Sidhu (1987) However according to Pineda (1985), modernization of agriculture recognized and supported the role of women in the development of adequate infrastructure service especially for home based industries

Chattopadhyay (1986) had also reported that the changing conditions of Indian agriculture had probably led to a major decline in the proportion of self employment and a rise in the proportion of the wage employment in the rural female working force According to Longe (1988) in order to appreciate the improved agricultural technology women had to be educated According to Tourincho et al (1986), land inequality and technology were negatively correlated in the case of women

A survey, conducted between 1963 and 1983 by Masiukiewiez (1983) revealed that, man predominated being employed chiefly in the more mechanized arable side while women predominated in livestock production, which was less mechanised Saikea and Srikula Gogoi (1981) had reported that, the heavy work load of tribal and rural women in agriculture would be lessened with the introduction of improved technology. Kwiecien (1983) observed that, the wives of part time farmers had a very heavy work load, especially in summer with little machinery or help.

Sethi (1982) reported that, female agricultural labour in Punjab, a region which had achieved almost optimum agricultural

output with a negligible utilisation of its women in the development process

According to Chen (1988) reported that land poor women faced the standard problems of lack of credit and risk bearing capacity to invest in High Yielding Varieties and the lack of equipment

Dak et al (1986) had reported, social and institutional factors particularly caste, landholding status, family education and mechanisation of agriculture had exerted a more adverse influence on female labour participation Economic changes had led to relatively little alteration in the relationship between men and women at the household level Studies conducted by Sharma (1980) among North West India women workers and Hulsen (1981) and Ingle and Khai (1987) among Maharashtra women agricultural labourers had revealed that, eventhough majority of the women belonged to scheduled caste, illiterate and bearing a heavy work load, they were reported to be self satisfied with their life style

Patel (1982) reported that women were the most undernourished, economically the most vulnerable and socially the most depressed groups of workers in society But they performed tasks essential to any society's survival from raising children to growing food and to feed their families (UNICEF, 1985) It was also reported women were becoming aware that if they wished to

contribute to the well being of the family, the best way was to become a wage earner A study conducted by International Centre for Research on Women (1980) has revealed that there was dramatic increase globally in the participation of women in economic activity as wage earners, as self employed and as entrepreneurs

Jain (1983) had reported that involvement of the rural women in both family and economic activities was considered a pivotal factor in the process of change in rural areas

According to Jhurani (1985) in addition to outside work, women worker performed the tasks such as cooking, washing utensils and clothes, and upbringing of children All these multiple roles of women were considered to be a part of their role as 'ideal mothers' and 'ideal wife' depriving their right to be an independent economic status

Rao (1987) has reported that, outside employment taken up by the women led to negligence of their own health and had led to various nutritional problems In a survey conducted by International Centre for Research on Women (1980), it was reported that, both home and market production by women forced them to work longer hours and to have less leisure time than men and Patel (1982) had found that, women were burdened with family responsibilities and their allocated place in the labour market Ozorio (1984) had reported that due to women's dual burden of domestic

responsibilities and income generating activities, women might never find time to seek medical help except in extreme cases

Cernea (1977) rightly pointed out that, "If agriculturewas a task to be carried out on the shoulders of giants, the giants were now a days mainly the women

Chandra (1988) had opined that, women workers suffered from maximum insecurity in employment when compared to male workers According to Ngonyani (1985), women had received only part of the value produced by their long and hard work, the benefits of which go to other people Jhurani (1985) had reported that, a tendency prevailed to exploit female labour because of their poor bargaining power and this fact lowered the dignity of female labour According to Chem (1988) women were paidless than men for the same agricultural operations

In a review published by women and the New International Economic Order (1980), it had been reported that the low social status prevented women from being given the opportunity to take more active part in productive roles, and this inturn led to low social status They further reported that, the increase in women's participation in the job market resulted in deterioration of their living condition due to the disarticulation of the family structure and lack of time may keep women from essential preventive, health measures

Jhurani (1985) had reported that, the land owning class preferred to employ more women as agricultural workers as they could be easily paid much less when compared with their input in terms of work He had also reported that during peak season, female labour was in maximum demand and when the demand for labour decreased, it was the women who faced unemployment crisis

Jhurani (1985) conducted a survey among rural women of Punjab and found that, women from the landless families worked as agricultural labourers during all the seasons and involved in various agricultural operation without much advantages to them He again stated that, the work force participation of women in Punjab was ranked as one of the lowest in the country and as one having the lowest participation of female workers to the total workers According to Chen (1988), the incidence of women agricultural labourers was high in irrigated rice areas but not in rice areas as such. Chen had also reported that the [illegible] of women agricultural labourers was higher in the high productivity rice growing coastal districts of Andhra Pradesh and Tamil Nadu than in the low productivity, rain-fed-rice-growing districts of West Bengal, Orissa and Bihar

# Materials and Methods

## MATERIALS AND METHODS

A study was conducted to evaluate the influence of Food consumption and energy expenditure pattern of agricultural labourers of Trivandrum District The study was designed

a) To assess the socio-economic profile of the families

b) To assess the food consumption pattern of the families

c) To ascertain the personal characteristics of the labourers and

d) To locate the problems and occupational hazards faced by them

e) A detailed study was conducted on a sub sample of 20 labourers with reference to their

   i) actual food intake

   ii) anthropometric measurements

   iii) daily energy expenditure pattern

   iv) clinical examination and

   v) biochemical examination

### I. Area of study

The area selected for the study comes under the jurisdiction of Kalliyoor Krishi Bhavan in Nemon NES Block, Trivandrum District, since, greater number of agricultural labourers are residing in this area

## II. Plan of action

The plan of action of present study comprised

a) Selection of 150 agricultural labourers by multistage random sampling method

b) A base line survey to monitor the socio-economic and personal characteristics of these labourers

c) A dietary survey of the families to assess their food consumption pattern and

d) Ascertaining the nutritional status of the labourers through Weighment survey, Daily energy expenditure pattern, Anthropometric survey, Clinical studies and Biochemical studies

## III. Selection of samples

In the present study, a total of 150 agricultural labourers were selected based on multistage random sampling method Among the 150 labourers selected, 75 were male labourers and 75 female labourers

## IV. Methods selected for the study

Interview method was selected for the study since this method was ideal for collecting data under village situation (Bingham and Moore, 1924) As pointed out by Lindzey (1954), in this method, there is a face to face verbal interchange between

interviewer and respondent before eliciting information Devadas and Kulandaivel (1975) had felt that, this is a systematic method by which a person can enter more or less imaginatively into the inner life of a comparative stranger Interview method is reported to be the most suitable way since it proceeds systematically and records the collected information quickly (Bass et al , 1979) In the present study, using this method, assessment of the socio-economic profile of the families, personal characteristics of the respondents as well as the food consumption pattern of the families were assessed among 150 families The schedule used for the survey is presented in Appendix I

(i) The required information on socio-economic and personal characteristics such as religion, type of family, family system, family size and composition, economic status and its details, monthly expenditure pattern especially food, savings, repaying loans and debt faced by the families etc According to Sirshi (1985), to ascertain socio-economic and personal characteristics, parameters such as age, marital status, type of family, size of family, monthly income and caste are to be ascertained

(ii) Information on food consumption pattern of the families were determined by eliciting information on dietary habits, frequency of usage of various food items and home production of foods by the families Dietary habits of the families

Weighment survey was carried out in a sub sample of 20 families to get accurate quantified information on actual food intake Among diet survey methods, commonly employed for determining dietary intakes of population, the conventional seven days weighment method has been considered as the most reliable by Visweswara Rao (1974) According to Marr (1971), the usual way of estimating actual food intake is through household consumption surveys The classical weighment method (ie., weighment of raw foods) involves actual weighment of (edible portion before cooking) raw foods This has been accurate for assessing food consumption, but according to Thimmayamma and Rao (1981), it is laborious and time consuming and is much dependent on the availability of foods at home Gore et al (1977) had suggested that only weighment method can give reasonably accurate values of dietary intakes Recall method is not effective even to identify the different items in diet According to Visweswara Rao (1975) any single day or 2 days weighment method would be as efficient a tool as that of 7 days

In the present study a three day food Weighment was conducted in 20 families During the food weighment survey, the investigator was with the families throughout the period of weighment All the raw foods taken out for cooking were

weighed and the total cooked weight of each preparation was recorded The food consumed by the individual labourer was also taken Then the food intake of the labourers was obtained The nutrients available from the food intake was computed using food composition tables (ICMR, 1987)

A dietary study can reveal information on the number of different foods eaten, as an estimate of variety, and this might be correlated with nutrient intake and hence demonstrated the relevance of the concept of variety of the population to be educated (Wise et al , 1987) In this study also the quantity of each food items as well as the computed nutritive value was compared with the recommended daily allowance of foods and nutrients by ICMR (1989)

The energy requirement must be assessed in terms of energy expenditure rather than on energy intake The actual energy expenditure of agricultural labourers was examined by employing the proposed Basal Metabolic Rate (BMR) factors and computed BMR values, the energy requirement in Kilocalories of the labourers were calculated (ICMR, 1989)

(c) Nutritional status of the labourers were assessed through anthropometric, clinical and biochemical studies in a sub sample of 20 According to Browne and Numani (1978), nutritional assessment is a necessary tool of any attempt

Swaminathan (1986), clinical examination is the most important part of nutritional assessment as we get direct information on signs and symptoms of dietary deficiencies prevalent among people The investigator with the help of a qualified physician from the adjacent Primary Health Centre (PHC) in the broad day light, assessed the clinical symptoms of malnutrion among labourers

(e) Suitable laboratory technique was used to estimate the haemoglobin of the labourers and the details are presented in Appendix IV

(v) Problems and occupational hazards faced by the agricultural labourers especially women were collected In this, problems due to work and health, opinion about the work, problems faced by the working women, unfulfilling the dual responsibilities as wage earner and home maker, and specific problems during pregnancy and lactation were the major factors about which information was elicited

**Statistical methods**

Suitable statistical techniques were applied for interpreting the data collected

# Results

## RESULTS

A study to assess the Food consumption and energy expenditure pattern of the agricultural labourers of Trivandrum District was conducted The survey was conducted among the families of 75 male labourers and 75 female labourers The data collected were analysed and the results were presented under the following headings

1 Socio-economic profile of the families surveyed

2 Food consumption pattern of the families

3. Personal characteristics of the agricultural labourers

4 Specific problems and occupational hazards faced by the agricultural labourers

5 Food intake, energy expenditure pattern and nutritional status of the agricultural labourers

### 1. Socio-economic profile of the families surveyed

The socio-economic profile of the families of the agricultural labourers were studied with special reference to their religion, type of family, family system followed, details of the head of the family, land size, family size, employment status of the family members, monthly income level and monthly expenditure pattern of the families.

Details regarding the religion and caste of the labourers surveyed are presented in Table 1

Table 1 Religion and Caste of the families

| Religion | Caste | A | | B | | Total | |
|---|---|---|---|---|---|---|---|
| | | No | % | No | % | No | % |
| Hindu | | | | | | | |
| Forward | Nair | 5 | 6 67 | - | - | 5 | 3 33 |
| Backward | Ezhava | 6 | 8 00 | 4 | 5 33 | 10 | 6 67 |
| | Nadars | 15 | 20 00 | 4 | 5 33 | 19 | 12 67 |
| | Scheduled Castes | 13 | 17 33 | 22 | 29 34 | 35 | 23 33 |
| Total | | 39 | 51 00 | 30 | 40 00 | 69 | 46 00 |
| Christian | | | | | | | |
| Forward | Roman Catholic | 3 | 4.00 | 4 | 5 33 | 7 | 4 67 |
| | CSI | 14 | 18.67 | - | - | 14 | 9 33 |
| Backward | Nadars | 15 | 20 00 | 9 | 12 00 | 24 | 16 00 |
| | Cheramar | 4 | 5 33 | 32 | 42 67 | 36 | 24 00 |
| Total | | 36 | 48 00 | 45 | 60 00 | 81 | 54 00 |
| Grand Total | | 75 | 100 00 | 75 | 100 00 | 150 | 100 00 |

A - Families of male agricultural labourers
B - Families of female agricultural labourers

As depicted in Table 1, more than half of the labourers surveyed were Christians (54 0 per cent) Among the families survyed, 26 0 per cent belonged to the privileged community and 74 0 per cent were from, underprevileged communities Majority of the agricultural labourers were from backward communities like Ezhavas (6 67 per cent), Hindu Nadars (12 67 per cent), Christian Nadars (16 0 per cent), Cheramar Christians (24 0 per cent) and Scheduled Castes (23 33 per cent)

Majority of the families surveyed were nuclear type families (82 0 per cent) followed by extended families (10 67 per cent) and joint families (7 33 per cent) 96.67 per cent of the families were following patriarchal system, while only very few families (3 33 per cent) were following matriarchal system. And 82 67 per cent of the families were male headed and 17 33 per cent were female headed

Table 2 presents details regarding the land possessed by the families.

As revealed in Table 2, possession of land by the families were limited, ranging from 0 to 70 cents Out of the total 150 families, 21 33 per cent of the families we e landless, 17 33 per cent possessed land upto 5 cents and 22 0 per cent from 6 to 10 cents. More than 35 cents of land were possessed only by 9 33 per cent of the families surveyed

Table 2 Possession of land by the families of agricultural labourers

| Land size in cents | Male respondents | | Female respondents | | Total | |
|---|---|---|---|---|---|---|
| | Number | Per cent | Number | Per cent | Number | Per cent |
| Nothing | 11 | 14 67 | 21 | 28 00 | 32 | 21 33 |
| 1-5 | 8 | 10 67 | 18 | 24 0 | 26 | 17 33 |
| 6-10 | 13 | 17 33 | 20 | 26 67 | 33 | 22 00 |
| 11-15 | 12 | 16.00 | 8 | 10 67 | 20 | 13 33 |
| 16-20 | 8 | 10.67 | 2 | 2 67 | 10 | 6.67 |
| 21-25 | 4 | 5 33 | 1 | 1 33 | 5 | 3 33 |
| 26-30 | 4 | 5.34 | 1 | 1.33 | 5 | 3 33 |
| 31-35 | 4 | 5 33 | 1 | 1 33 | 5 | 3 33 |
| 36-40 | 1 | 1 33 | 1 | 1 33 | 2 | 1 33 |
| 41-45 | 1 | 1 33 | - | - | 1 | 0 67 |
| 46-50 | 3 | 4 00 | 1 | 1 33 | 4 | 2 67 |
| 51-55 | 1 | 1 33 | - | - | 1 | 0 67 |
| 56-60 | 1 | 1.33 | - | - | 1 | 0 67 |
| 61-65 | 2 | 2 67 | 1 | 1 33 | 3 | 2 00 |
| 66-70 | 2 | 2 67 | - | - | 2 | 1 33 |
| Total | 75 | 100.00 | 75 | 100 00 | 150 | 100 00 |

Details of family size of the 150 families surveyed are given in Table 3

As indicated in Table 3, majority of the families were with 3 to 5 members, while 22 67 per cent of the families were having 6 to 8 members and only very few families (2 0 per cent) had more than 8 members

Table 4 presents the demographic profile of the families surveyed Family members were grouped according to variation in their age

As revealed in the table, in general, there were more female members than male members From the results of the survey it was also evident that adult population (18 and above) were more and comprised of 242 male (68 75 per cent) and 252 female members (67 38 per cent) The remaining population were mainly in the age range of 13 to 17 (19 25 per cent). About 13 0 per cent of the population were child population

Details of the number of persons employed in a family are given in Table 5

As depicted in Table 5, 57 33 per cent of the families was found to have two members employed outside home mainly the respondents and their spouses, while in 35 33 per cent of the families, only the respondents were employed In 7 33 per cent of the families surveyed besides parents, children were also employed

Table 3 Details of family size

| Number of family members | Male respondents | | Female respondents | | Total | |
|---|---|---|---|---|---|---|
| | Number | Per cent | Number | Per cent | Number | Per cent |
| Less than 3 | 2 | 2 67 | 6 | 8 00 | 8 | 5 33 |
| 3-5 | 55 | 73 33 | 50 | 66 67 | 105 | 70 00 |
| 6-8 | 16 | 21 33 | 18 | 24 00 | 34 | 22 67 |
| Above 8 | 2 | 2 67 | 1 | 1 33 | 3 | 2 00 |
| Total | 75 | 100 00 | 75 | 100 00 | 150 | 100 00 |

Table 4. Demographic profile of the families

| Age range | Male respondents | | | | Female respondents | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | | B | | A | | B | | A | | B | |
| | Number | Per cent | Number | Per cent | Number | Per cent | Number | Per cent | Number | Per cent | Number | Per cent |
| 18 and above | 131 | 67.88 | 120 | 65.57 | 111 | 69.81 | 132 | 69.11 | 242 | 68.75 | 252 | 67.38 |
| 13-17 | 35 | 18.13 | 36 | 19.67 | 35 | 22.01 | 36 | 18.85 | 70 | 19.89 | 72 | 19.25 |
| 7-12 | 18 | 9.32 | 12 | 6.55 | 7 | 4.40 | 13 | 6.81 | 25 | 7.10 | 25 | 6.68 |
| 4-6 | 2 | 1.03 | 9 | 4.92 | 3 | 1.89 | 5 | 2.62 | 5 | 1.42 | 14 | 3.74 |
| 1-3 | 6 | 3.10 | 6 | 3.28 | 2 | 1 26 | 4 | 2.09 | 8 | 2.27 | 10 | 2.67 |
| Infants <1 | 1 | 0.51 | 0 | 0 | 1 | 0.63 | 1 | 0.52 | 2 | 0.57 | 1 | 0.28 |
| | 193 | 100 | 183 | 100 | 159 | 100 | 191 | 100 | 352 | 100 | 374 | 100 |

A - Male members in the respondents

B - Female members in the respondents

Table 5 Number of persons employed

| Number of members employed | A | | B | | Total | |
|---|---|---|---|---|---|---|
| | Number | Per cent | Number | Per cent | Number | Per cent |
| 1 | 34 | 45 33 | 19 | 25 33 | 53 | 35.33 |
| 2 | 38 | 50 67 | 48 | 64.00 | 86 | 57 34 |
| 3 and above | 3 | 4 00 | 8 | 10 67 | 11 | 7 33 |
| Total | 75 | 100 00 | 75 | 100 00 | 150 | 100 00 |

A - Families of male agricultural labourers
B - Families of female agricultural labourers

Monthly income of the families surveyed, is given in Table 6

As depicted in Table 6, monthly income range of the 93 0 per cent of the families was observed to be Rs 501/- to Rs 2000/- in the families of labourers surveyed

Family size and number of persons employed in a family are two major factors influencing their monthly income and its utilisation Data were analysed on these lines and the results are presented in Table 7 and 8

As depicted in Table 7, per capita income of the 91 0 per cent of the families were observed to be in the range of Rs 101 to Rs 500/- and family size is found to be a factor negatively influencing the economic status of the two categories of the families surveyed

Table 8 Presents the variation in the monthly income of the families with reference to the number of family members employed

As revealed in the table, this factor positively influences the income level of the families. Compared to the families of male agricultural labourers, families of female agricultural labourers were found to be in an advantageous position And data when statistically treated, depicted significant variation between the two categories of the families A comparison of the families of male agricultural

Table 6 Monthly income of the families

| Monthly income | A | | B | | Total | |
|---|---|---|---|---|---|---|
| | Number | Per cent | Number | Per cent | Number | Per cent |
| Below Rs 500 | 1 | 1 33 | 0 | 0 | 1 | 0 67 |
| Rs 501-1000 | 19 | 25 33 | 22 | 29 33 | 41 | 27 33 |
| Rs 1001-1500 | 32 | 42 67 | 22 | 29 33 | 54 | 36 00 |
| Rs.1501-2000 | 20 | 26 67 | 25 | 33 34 | 45 | 30 00 |
| Rs 2001-2500 | 3 | 4 00 | 4 | 5 33 | 7 | 4 67 |
| Above Rs 2501 | 0 | 0 | 2 | 267 | 2 | 1 33 |
| Total | 75 | 100 00 | 75 | 100 00 | 150 | 100 00 |

A - Families of male agricultural labourers
B - Families of female agricultural labourers

Table 7 Per capita income of the family

| Income in range | A | | B | | Total | |
|---|---|---|---|---|---|---|
| | Number | Per cent | Number | Per cent | Number | Per cent |
| Below 100 | 1 | 1 33 | 1 | 1 33 | 2 | 1 33 |
| 101-250 | 34 | 45 34 | 25 | 33 34 | 59 | 39 34 |
| 251-500 | 36 | 48 00 | 43 | 57 33 | 79 | 52 67 |
| 501-750 | 3 | 4 00 | 5 | 6 67 | 8 | 5 33 |
| 751-1000 | 1 | 1 33 | 1 | 1 33 | 2 | 1 33 |
| Total | 75 | 100 00 | 75 | 100 00 | 150 | 100 00 |

A - Families of male agricultural labourers
B - Families of female agricultural labourers

Table 8. Monthly income of the families with reference to the number of family members employed (in per cent)

| Monthly income | Details of family members employed | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Only One member | | | 2 members | | | 3 members and more | | |
| | A | B | Total | A | B | Total | A | B | Total |
| Below 500 | 1 33 (1) | - | 0 67 (1) | - | - | - | - | - | - |
| Rs 501-1000 | 24 00 (18) | 22.66 (17) | 23 33 (35) | 1 33 (1) | 5 33 (4) | 3 33 (5) | - | 1 33 (1) | 0 67 (1) |
| Rs 1001-1500 | 16 00 (12) | 2 67 (2) | 9 33 (14) | 25 34 (19) | 26 67 (20) | 26 00 (39) | 1 33 (1) | - | 0 67 (1) |
| Rs 1501-2000 | 4.00 (3) | - | 2 00 (3) | 21 33 (16) | 28 00 (21) | 24 67 (37) | 1 33 (1) | 3 34 (4) | 3 33 (5) |
| Rs 2001-2500 | - | - | - | 2 64 (2) | 4 00 (3) | 3 34 (5) | 1 34 (1) | 1 33 (1) | 1 33 (2) |
| Above Rs 2501 | - | - | - | - | - | - | - | 2 67 (2) | 1 33 (2) |
| | 45 33 (34) | 25 33 (19) | 35 33 (53) | 50 67 (38) | 64 00 (48) | 57 34 (86) | 4 00 (3) | 10 67 (8) | 7 33 (11) |

(Figures in parenthesis indicates number of persons)

A - Families of male agricultural labourers Correlation coefficient 0 3849** (Significant at 1% level)

B - Families of female agricultural labourers Correlation coefficient 0 1961 (N S)

AB - Correlation coefficient 0 2915** (Significant at 1% level)

labourers, on the basis of this grouping also revealed significant variation among the families While in the case of families of female agricultural labourers, the variations were not significant

Expenditure pattern of a family was based on the income Expenditure for basic needs like food, shelter and clothing were incurred by all the families, irrespective of their income level Expenditure to be incurred for other items, like transportation, fuel, electricity, education and recreation was varying according to the income of the family

Monthly food expenditure pattern of the families is presented in Table 9

The monthly food expenditure pattern of the families was divided in to different ranges from 0 to 90 per cent as shown in Table 9 The expenditure on food by majority of the families, excluding convenient food items and food outside home, ranged from 21 to 90 per cent of their monthly income More families were found to be in the habit of spending 41 to 80 per cent of their income for family meals This trend was more common among the families of female agricultural labourers. Regarding expenditure on convenient food items, only 55 33 per cent of the families were in the habit of purchasing convenient food items But they spent only 1 to 10 per cent of their income for this purpose Expenditure on food outside home did not exceed 20 0 per cent of the monthly income

Table 9. Percentage distribution of families with reference to monthly food expenditure pattern

| Expenditure range | Main family meals | | | Convenient food items | | | Foods taken outside home | | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | Total | A | B | Total | A | B | Total |
| No expenditure | - | - | - | 40 00 (30) | 49 33 (37) | 44 67 (67) | 5 33 (4) | 2 67 (2) | 4 00 (6) |
| Upto 10% | 11 33 (1) | - | 0 67 (1) | 60 00 (45) | 50 67 (38) | 55 33 (83) | 84 00 (63) | 89 33 (67) | 86 67 (30) |
| 11-20% | - | - | - | - | - | - | 10 67 (8) | 8 00 (6) | 9 33 (14) |
| 21-30% | 2 67 (2) | - | 1 33 (2) | - | - | - | - | - | - |
| 31-40% | 5 33 (4) | 6 67 (5) | 26 00 (9) | - | - | - | - | - | - |
| 41-50% | 20 00 (15) | 24 00 (18) | 22.00 (33) | - | - | - | - | - | - |
| 51-60% | 42 67 (32) | 30 67 (23) | 36 67 (55) | - | - | - | - | - | - |
| 61-70% | 17 33 (13) | 21 33 (16) | 19 33 (29) | - | - | - | - | - | - |
| 71-80% | 6 67 (5) | 13 33 (10) | 10 00 (15) | - | - | - | - | - | - |
| 81-90% | 4 00 (3) | 4 00 (3) | 4 00 (6) | - | - | - | - | - | - |
| Total | 100 00 (75) | 100 00 (75) | 100 00 (150) | 100 00 (75) | 100 00 (75) | 100 00 (150) | 100 00 (75) | 100 00 (75) | 100 00 (150) |

A - Families of male agricultural labourers Correlation coefficient 0 6511** (Significant at 1% level)
B - Families of female agricultural labourers Correlation coefficient 0 7948** (Significant at 1% level)
AB - Correlation coefficient 0 7368** (Significant at 1% level)

of these families and 86.67 per cent of the families spent only 1 to 10 per cent and only 9 33 per cent spent 11 to 20 per cent of their total income for this purpose Compared to the families of male agricultural labourers, female agricultural labourers were spending more money for this purpose There was significant variation between the two categories of families in their food purchasing pattern. Similarly there was significant variation in the food expenditure pattern among the families within each category

Details regarding the expenditure on non food items like clothing, shelter, transportation, fuel, electricity, personal expenditure, education expenditure, recreation, ceremonies/festivals, gift, repairing and maintenance of farm implements, maintenance of house etc. are presented in Table 10.

As revealed in Table 10, less than 10 0 per ce monthly income was spent for purchasing non food families surveyed As depicted in the table, fe agricultural labourers were giving more weightage clothing, electricity, personal and education expenditur and maintenance of farm implements while families of female ural labourers were spending more for items like clothing, shelter, transportation, fuel, recreation, ceremonies/festivals, gift and maintenance of house

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Table 10 Percentage distribution of agricultural labourers with reference to monthly expenditure for non food items

| Particulars | Expenditure pattern | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No expenditure | | | Upto 10% | | | 11-20% | | | 21 30% | | |
| | A | B | Total | A | B | Total | A | B | Total | A | B | Total |
| Clothing | | - | | 13 33 (10) | 94 67 (71) | 54 00 (81) | 86 67 (65) | 5 33 (4) | 46 00 (69) | | | |
| Shelter | 29 33 (22) | 21 33 (16) | 25 33 (38) | 70 67 (53) | 78 67 (59) | 74 67 (112) | - | | | | | |
| Transporation | 25 33 (19) | 16 00 (12) | 20 67 (31) | 74 67 (56) | 84 00 (63) | 79 33 (119) | - | | | - | | |
| Fuel | 26 67 (20) | 20 00 (15) | 23 33 (35) | 68 00 (51) | 78 67 (59) | 73 34 (110) | 5 33 (4) | 1 33 (1) | 3 33 (5) | - | | |
| Personal expenditure | 4 00 (3) | 1 33 (1) | 2 66 (4) | 72 00 (54) | 81 34 (61) | 76 67 (115) | 21 33 (16) | 16 00 (12) | 18 66 (28) | 2 67 (2) | 1 33 (1) | 2 00 (3) |
| Education expenditure | 33 33 (25) | 38 67 (29) | 36 00 (54) | 57 34 (43) | 52 00 (39) | 54 67 (82) | 9 33 (7) | 8 00 (6) | 8 67 (13) | | 1 33 (1) | 0 67 (1) |
| Recreation | 34 67 (26) | 36 00 (27) | 35 33 (53) | 65 33 (40) | 64 00 (48) | 64 67 (97) | - | | | - | | |
| Ceremonies/festivals | 17 33 (13) | 8 00 (6) | 12 67 (19) | 82 67 (62) | 92 00 (69) | 87 33 (131) | - | - | | | | |
| Cift | 21 33 (16) | 8 0 (6) | 14 67 (32) | 78 67 (59) | 92 00 (69) | 85 33 (128) | - | | | | | |
| Repairing and maintenance of farm implements | 82 67 (62) | 94 67 (71) | 88 67 (133) | 17 33 (13) | 5 33 (4) | 11 33 (17) | | | | | | |
| Maintenance of house | 100 00 (72) | 86 00 (72) | 98 00 (147) | | 2 67 (2) | 1 33 (2) | | 1 33 (1) | 0 67 (1) | | | |

Number given in parenthesis
A - Families of male agricultural labourers
B Families of female agricultural labourers

of these families and 86 67 per cent of the families spent only 1 to 10 per cent and only 9 33 per cent spent 11 to 20 per cent of their total income for this purpose Compared to the families of male agricultural labourers, female agricultural labourers were spending more money for this purpose There was significant variation between the two categories of families in their food purchasing pattern. Similarly there was significant variation in the food expenditure pattern among the families within each category

Details regarding the expenditure on non food items like clothing, shelter, transportation, fuel, electricity, personal expenditure, education expenditure, recreation, ceremonies/festivals, gift, repairing and maintenance of farm implements, maintenance of house etc are presented in Table 10.

As revealed in Table 10, less than 10 0 per cent of the monthly income was spent for purchasing non food items by the families surveyed As depicted in the table, families of male agricultural labourers were giving more weightage for items like clothing, electricity, personal and education expenditure, repairing and maintenance of farm implements while families of female agricultural labourers were spending more for items like clothing, shelter, transportation, fuel, recreation, ceremonies/festivals, gift and maintenance of house

Monthly expenditure for savings and repaying loans is presented in Table 11

As shown in Table 11, majority of the families was found to have savings ranging from 0 to 40 0 per cent of their income, 46 0 per cent of the families was found to save 1 to 10 0 per cent of their monthly income, 16 0 per cent had a saving of 11 to 20 per cent of the total income per month, 7 33 per cent had a monthly saving of 21 to 30 0 per cent and only 0 67 per cent had a saving of 31 to 40 0 per cent of the income Families of female agricultural labourers were allocating higher percentage of income for savings Similarly for repaying loans, 10 0 per cent of the income was spent by the families of the two categories In this context also, families of female agricultural labourers were spending more of their income

Majority of the families (80 0 per cent) were free from debt Compared to the families of male agricultural labourers, families of female agricultural labourers were in a more advantageous position Purchasing pattern of every food article was found to influence positively or negatively the purchase of the other food articles Data processed are presented in Appendix V and VI

Percentage distribution of families with reference to monthly expenditure on staple food items is presented in Table 12

Table 11 Percentage distribution of agricultural labourers with reference to monthly expenditure for savings and repaying loans

| Expenditure range | Savings | | | Repaying loans | | |
|---|---|---|---|---|---|---|
| | A | B | Total | A | B | Total |
| No expenditure | 32 00 (24) | 28 00 (21) | 30.00 (45) | 33 33 (25) | 24 00 (18) | 28 67 (43) |
| Upto 10% | 44 00 (33) | 48 00 (36) | 46 00 (69) | 46 67 (35) | 54 67 (41) | 50 67 (76) |
| 11-20% | 13 33 (10) | 18 67 (14) | 16 00 (24) | 13 34 (10) | 21 33 (16) | 17 33 (26) |
| 21-30% | 9 34 (7) | 4 33 (4) | 7 33 (11) | 4 00 (3) | - | 2 00 (3) |
| 31-40% | 1 33 (1) | - | 0.67 (1) | 1 33 (1) | - | 0 66 (1) |
| 41-50% | - | - | - | 1 33 (1) | - | 0 67 (1) |
| Total | 100 00 (75) | 100 00 (75) | 100 00 (150) | 100 00 (75) | 100 00 (75) | 100 00 (150) |

A - Families of male agricultural labourers
B - Families of female agricultural labourers

Table 12 Percentage distribution of families with reference to monthly expenditure on staple food items

| Expenditure range | Cereals (rice) | | | Roots and tubers | | |
|---|---|---|---|---|---|---|
| | A | B | Total | A | B | Total |
| No expenditure | - | - | - | 9 33 (7) | 6 67 (5) | 8 00 (12) |
| Upto 10% | - | 1 33 (1) | 0 66 (1) | 74 67 (56) | 76 00 (57) | 75 33 (113) |
| 11-20% | - | - | - | 13 34 (10) | 17 33 (13) | 15 33 (23) |
| 21-30% | 16 00 (12) | 9 33 (7) | 12 67 (9) | 1 33 (1) | - | 0 67 (1) |
| 31-40% | 37 33 (28) | 42 67 (32) | 40 00 (60) | - | - | - |
| 41-50% | 38 67 (29) | 36 00 (27) | 37 33 (56) | 1 33 (1) | - | 0 67 (1) |
| 51-60% | 8 00 (6) | 9 34 (7) | 8 67 (13) | - | - | - |
| 61-70% | - | 1 33 (1) | 0 67 (1) | - | - | - |
| Total | 100 00 (75) | 100 00 (75) | 100 00 (150) | 100 00 (75) | 100 00 (75) | 100 00 (150) |

A - 0 6665** (1% level), 0 2785** (5% level)
B - 0 7260** (1% level), 0 5400** (1% level)
AB - 0 7068** (1% level), 0 3406** (1% level)

A - Families of male agricultural labourers
B - Families of female agricultural labouers

Cereals, especially, rice was the major staple food consumed by the families As shown in the table, the expenditure on cereal for the families were upto 70 per cent of their total food expenditure 12 67 per cent of the families were spending about 21 to 30 per cent of their total food expenditure for the purchase of staple food articles, and 40 0 per cent of the families were spending around 31 to 40 0 per cent of their total food expenditure for the same More than 40 0 per cent of the food expenditure was incurred for the purchase of staple food by 46 67 per cent of the families Next to rice, roots and tubers were the staple food of the families surveyed However comparatively less amount was spent for effecting the purchase of this food A comparison of the total food expenditure on the amount spent for the purchase of cereals and roots and tubers were made There was significant variation between the two categories of the families Similarly a comparison among families, within each category also indicated significant variation

Monthly expenditure on the purchase of perishable food articles is presented in Table 13

As depicted in Table 13, only 1 to 10 per cent of the total food expenditure was found to be incurred for the purchase of perishable articles such as green leaves (53 33 per cent), vegetables (91 33 per cent), milk and milk products (58 67 per cent), fruits (68 67 per cent), egg (35 33 per cent), fish (39 33

Table 13. Percentage distribution of families with reference to monthly

| Expenditure range | Green leaves | | | Vegetables | | | Milk and milk products | | | Fruits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | Total | A | B | Total | A | B | Total | A | B | Total |
| No expenditure | 33.33 (25) | 60.00 (45) | 46.66 (70) | 4.00 (3) | 1.33 (1) | 2 66 (4) | 29 33 (22) | 14.66 (11) | 22.00 (33) | 29.33 (22) | 33.33 (25) | 31.33 (47) |
| Upto 10% | 66.66 (50) | 40.00 (30) | 53 33 (80) | 89 33 (67) | 93.33 (70) | 91 33 (137) | 48 00 (36) | 69.33 (52) | 58.16 (88) | 70.66 (53) | 66.66 (80) | 68.66 (103) |
| 11-20% | - | - | - | 6 16 (5) | 5.33 (4) | 6 00 (9) | 21 33 (16) | 14.66 (11) | 18.00 (27) | - | - | - |
| 21-30% | - | - | - | - | - | - | - | 1 33 (1) | 0.66 (1) | - | - | - |
| 31-40% | - | - | - | - | - | - | 1.33 (1) | - | 0.66 (1) | - | - | - |
| 41-50% | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 100 (75) | 100 (75) | 100 (150 | 100 (75) | 100 (75) | 100 (150) | 100 75) | 100 (75) | 100 (150) | 100 (75) | 100 (75) | 100 (150) |

| | | | | |
|---|---|---|---|---|
| - Families of male agrl labourers | 0 0079 (n s) | 0.2501* (5% level) | 0 4875** (1% level) | 0.0907 (n s) |
| - Families of female agrl labourers | 0.2119 (n.s) | 0.5108** (1% level) | 0.3355** (1% level) | 0.3437** (1% level) |
| - Total | 0.660 (n.s) | 0.4231** (1% level) | 0.4051 (1% level) | 0.1862 (n.s) |

per cent), meat (67 33 per cent), fats and oils (96 67 per cent) and bakery items (56 67 per cent) by the families

More than 30 0 per cent of the total food expenditure were found to incur for the purchase of milk and milk products and fish by few families (2 0 per cent) Statistically significant relationship was found for the purchase of vegetables, milk and milk products, fish, and fats and oils on a comparison of the two categories of the families and within each group

The expenditure per month for the purchase of dry food articles, incurred by the families is presented in Table 14

Monthly expenditure on dry food articles of the families were divided in to different ranges from 0 to 20 per cent For the purchase of dry food articles such as pulses (95 33 per cent), nuts and oil seeds (49 33 per cent), sugar and jaggary (99 33 per cent) and spices and condiments (99 33 per cent), only 1 to 10 per cent of the total food expenditure were found to be incurred by the families surveyed Statistically significant relationship was found for the purchase of pulses, sugar and jaggery and spices and condiments on a comparison of the two categories of families and within each group of respondents 11 to 20 per cent of the total food expenditure were found to incur for the purchase of pulses (3 33 per cent), nuts and oil seeds (28 0 per cent), sugar

Table 14. Percentage distribution of families with reference to monthly expenditure on dry food articles

| Expenditure range | Pulses | | | Nuts and oilseeds | | | Sugar and jaggery | | | Spices and condiments | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | Total | A | B | Total | A | B | Total | A | B | Total |
| No expenditure | - | 2.66 (2) | 1.33 (2) | 46.66 (32) | 17.33 (13) | 30.00 (45) | - | - | - | - | - | - |
| Upto 10% | 93.33 (70) | 97 33 (73) | 95.33 (143) | 40.00 (33) | 54.66 (41) | 49.73 (74) | 100 (75) | 98.66 (74) | 99.33 (149) | 100 (75) | 98.66 (74) | 99.33 (149) |
| 11-20% | 6.66 (5) | - | 3.33 (5) | 13.33 (10) | 28.00 (21) | 20.66 (31) | - | 1.33 (1) | 0.66 (1) | - | 1.33 (1) | 0.66 (1) |
| Total | 100 (75) | 100 (75) | 100 (150) | 100 (75) | 100 (75) | 100 (150) | 100 (75) | 100 (75) | 100 (150) | 100 (75) | 100 (75) | 100 (150) |
| Families of male agrl labourers | 0.2785* (5% level) | | | 0.4795** (1% level) | | | 0.4633** (1% level) | | | 0.5663** (1 level) | | |
| Families of female agrl labourers | 0 5400** (1 level) | | | 0.4395** (1 level) | | | 0.2365* (5% level) | | | 0.5399** (1 level) | | |
| Total | 0.3789** (1 level) | | | 0.4813** (1 level) | | | 0.3315** (1 level) | | | 0.5574** (1 level) | | |

and jaggery (0 67 per cent) and spices and condiments (0 67 per cent) etc

Influence of family income on purchasing pattern of their families in detail are presented in Appendix VII

**2. Food consumption pattern of the families**

Food consumption pattern of the families were assessed with regard to the dietary practices of the families and details pertaining to the production of foods at the household levels Dietary practices were mainly related to the frequency of use of various foods and culinary practices including cooking, storage and meal pattern in normal and special occasions

All the families surveyed were nonvegetarians by habit Frequency of using different food materials may indicate the nutritional adequancy of a meal The data collected on these lines are presented in Table 15

As revealed in Table 15, food articles like cereals, fats and oils, sugar and jaggery were the major items of the daily diet of all the families surveyed. Very few of the families included egg in their daily diet, when it was available at home Fruits were purchased occasionally by 70 67 per cent families Food items like vegetables, milk and animal foods mainly fish, were purchased daily in 71 0 to 99 0 per cent of the families And these food

Table 15. Frequency of using different

| | Cereals | | | Vegetables | | | Milk and milk products | | | Pulses | | | Roots and tubers | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | Total | A | B | Total | A | B | Total | A | B | Total | A | B | Total |
| Daily | 100 (75) | 100 (75) | 100 (150) | 73.33 (55) | 69.33 (52) | 71.33 (107) | 89.33 (67) | 88.00 (66) | 88.66 (133) | 21.33 (16) | 32.00 (24) | 26.66 (40) | 60.00 (45) | 50.66 (38) | 55.33 (83) |
| Once in a week | - | - | - | 2.66 (2) | 2.66 (2) | 2.66 (4) | - | - | - | 1.33 (3) | 5.33 (4) | 3.33 (5) | - | 2.66 (2) | 1.33 (2) |
| Twice in a week | - | - | - | 17.33 (13) | 18.66 (14) | 18.00 (27) | - | 1.33 (1) | 0.66 (1) | 30.66 (23) | 25.66 (20) | 28.66 (43) | 24.00 (18) | 20.66 (20) | (11) |
| Thrice in a week | - | - | - | 1 33 (1) | - | 0.66 (1) | - | - | - | 2.66 (2) | - | 1.53 (2) | 2.66 (2) | - | 1.33 (2) |
| Occasionally | - | - | - | 5.33 (4) | 9.33 (7) | 7.33 (11) | 10.66 (8) | 10.66 (8) | 10.66 (16) | 41.33 (31) | 26.66 (20) | 34.0 (51) | 13.33 (10) | 20.0 (15) | 16.66 (25) |
| Never | - | - | - | - | - | - | - | - | - | 2.66 (2) | - | 1.33 (2) | - | - | - |
| | 100 (75) | 100 (75) | 100 (150) | 100 (75) | 100 (75) | 100 (150) | 100 (75) | 100 (75) | 100 (150) | 100 (75) | 100 (75) | 100 (150) | 100 (75) | 100 (75) | 100 (150) |

Numbers given in parenthesis A - Households of male agrl. labourers

B - Households of female agrl. labourers

Table 15. Continued

food materials

| Fruits | | | Animal foods (fish) | | | Fats & oils | | | Sugar and jaggery | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | Total | A | B | Total | A | B | Total | A | B | Total |
| 8.00 (6) | 6.66 (5) | 7.33 (11) | 100.0 (75) | 98.66 (74) | 99.33 (149) | 100 (75) | 100 (75) | 100 (150) | 100 (75) | 100 (75) | 100 (150) |
| 4.0 (3) | 1.33 (1) | 2.66 (6) | - | - | - | | | | | | |
| 14.66 (11) | 20 (15) | 17.33 (26) | - | 1.33 (1) | 0.66 (1) | | | | | | |
| 2.66 (2) | 1.33 (1) | 2.00 (3) | - | - | - | | | | | | |
| 70.66 (53) | 70.66 (53) | 70.66 (106) | - | - | - | | | | | | |
| - | - | - | - | - | - | | | | | | |
| 100 (75) | 100 (75) | 100 (150) | 100 (75) | 100 (75) | 100 (150) | 100 (75) | 100 (75) | 100 (150) | 100 (75) | 100 (75) | 100 (150) |

articles were more used by the families of male agricultural labourers Less expensive food articles like roots and tubers were also purchased daily by 53 33 per cent families Pulses were purchased either daily (26 67 per cent) or twice in a week (28 67 per cent) or occasionally (34 0 per cent) in majority of the families surveyed

Home production of foods is an important factor influencing the food consumption pattern Details collected on these lines are presented in Table 16

Among the 150 families surveyed, only 50 0 per cent of the fa milies were found to be engaged in the production of foods Food articles produced at the household level were milk and milk products, egg, nuts and oil seeds (coconut), roots and tubers (tapioca), vegetables and fruits Among the various home based occupations, poultry keeping (16.0 per cent families), dairying (16 64 per cent families), kitchen gardening (10 61 per cent families) and cultivation of coconut garden were found to be popular

28 67 per cent of the families had taken up only one occupation while 16 61 per cent of the families had taken up two occupations. Only very few families were engaged in more than two types of occupations Three types of homebased occupations were taken up by 3 33 per cent families and 4 types only by 1 33 per cent families

Table 16. Home based production of foods

| Particulars | A | | B | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Not advocating house based production of foods | 30 | 40.0 | 45 | 60.0 | 75 | 50.0 |
| Cattle rearing | 3 | 4.0 | 4 | 5.33 | 7 | 4.66 |
| Poultry unit | 5 | 6.66 | 9 | 12.0 | 14 | 9.33 |
| Coconut garden | 12 | 16.0 | 6 | 8.0 | 18 | 12.0 |
| Cultivation of roots and tubers | 2 | 2.66 | 2 | 2.10 | 4 | 2.66 |
| Total | 22 | 29.33 | 21 | 28.0 | 43 | 28.66 |
| Vegetable garden + coconut garden | 1 | 1.33 | - | - | 1 | 0.66 |
| Poultry unit + cattle rearing | - | - | 1 | 1.33 | 1 | 0.66 |
| Vegetable garden + cultivation of roots and tubers | 1 | 1.33 | - | - | 1 | 0.66 |
| Poultry unit + coconut garden | 1 | 1.33 | 3 | 4.00 | 4 | 2.66 |
| Coconut garden + cultivation of roots & tubers | 4 | 5.33 | - | - | 4 | 2.66 |
| Cattle rearing + coconut garden | 10 | 13.33 | 4 | 5.33 | 14 | 9.33 |
| Total | 17 | 22.66 | 8 | 10.66 | 25 | 16.66 |
| Vegetable garden + fruits & cultivation of roots & tubers | 1 | 1.33 | - | - | 1 | 0.66 |
| Vegetable garden + cultivation of roots & tubers + poultry unit | 1 | 1.33 | - | - | 1 | 0.66 |
| Poultry unit + coconut garden + cultivation of roots and tubers | - | - | 1 | 1.33 | 1 | 0.66 |
| Coconut garden + cultivation of roots & tubers + fruits | 1 | 1.33 | - | - | 1 | 0.66 |
| Cattle rearing + cultivation of nuts & oil seeds + poultry unit | 1 | 1 33 | - | - | 1 | 0 66 |
| Total | 4 | 5.33 | 1 | 1.33 | 5 | 3.33 |
| Vegetable garden + cattle rearing + poultry unit + coconut garden | 2 | 2.66 | - | - | 2 | 1.33 |
| Grand Total | 75 | 100 | 75 | 100 | 150 | 100 |

A - Families of male agricultural labourers
B - Families of female agricultural labourers

Sixteen families had taken up maintaining poultry units as a household occupation Rate of production of egg/month were 4 to 10 eggs The survey also revealed that the eggs produced were completely utilised at the household level.

The quantity of roots and tubers produced at home annually were ranged from 26 kg to more than 100 kg Out of the total 150 families surveyed, 12 families had taken up this household activity 8 families were produced more than 76 kg of roots and tubers, which were fully utilised for their meals Only 1 family surveyed had taken up the cultivation of fruits viz , plantain Annual production of this crop was 50 kg and was completely used for household consumption

Nuts and oil seeds mainly coconut produced at home ranged from 10 to 300 per annum 48 families had taken up this cultivation Distribution of households (48) on the basis of production rate revealed that 8 families were selling upto 50 coconuts per year 51 to 100 coconuts were harvested by 13 families and 101 to 150 by 4 families 5 families harvested 151 to 200 coconut and 12 families harvested 201 to 300 coconut per year Only 6 families had harvested more than 300 coconuts per year Majority of the families had completely utilised the total nuts produced at home except very few families (1.33 per cent).

Information pertaining to the culinary practices was mainly related to preliminary preparation of food articles prior to cooking, process of cooking food articles and storage of various food articles An assessment of these factors will throw light on the nutritional adequacy of the meals consumed

Preparation of food articles prior to cooking by the home makers in the 150 families surveyed were studied and the data processed are presented in Appendix IX.

Among the 150 families surveyed, the main staple food items viz., rice was washed several times before they were kept on the fire place. Washing vegetables after cutting were found to be a common practice among the families surveyed 40.0 per cent of the families were in the habit of cutting vegetables into very small pieces immediately before cooking, while 15 33 per cent were in the habit of cutting vegetables into big pieces

Animal foods mainly fish were washed after cutting into small pieces by 78.0 per cent of the families. However, 22 0 per cent of the families were in the habit of cutting fish into big pieces

43 33 per cent of the families were in the habit of washing the pulses before cooking

18 67 per cent of the families washed roots and tubers after cutting into small pieces, 45 33 per cent of the families were in

the habit of cutting it into big pieces and 35 33 per cent of the families soaked the tubers before cooking.

Different types of cooking methods are generally applied to introduce variety to the meals and to conserve nutrients present in the raw foods Methods adopted by the families for cooking different food articles were ascertained and the data processed are presented in Appendix X

Variety in cereal cooking was absent since rice was consumed as cooked rice prepared by excess water and straining method (56 67 per cent) or as a porridge known as kanjee (43 33 per cent)

Vegetative preparation were either in liquid form in which the vegetables, pulses were cooked by boiling method (15 33 per cent) or in thick gravy where excess cooked water were removed (1 33 per cent) Seasoning with oil was very common for vegetable preparation by majority of the families (80 67 per cent) Steaming (2 0 per cent) or frying (0 67 per cent) methods were not popular for cooking vegetables Boiling followed by seasoning (74 67 per cent), steaming (4 0 per cent), steaming and frying (14 0 per cent) and roasting (7 33 per cent) were the common cooking procedures applied for pulse preparations.

Unlike vegetables and pulses, roots and tubers which were the main food items in certain meals, were cooked by steaming (88 0 per cent) or steaming and straining (12 0 per cent)

Unlike vegetable preparation, fish was prepared in the medium of oil (26 67 per cent) or in the medium of water (28 67 per cent), boiling followed by seasoning (44 67 per cent) was also a common practice

Common methods adopted for storing of food articles are presented in Table 17

Families were not in the habit of storing food articles due to their daily purchasing habit of foods like rice (15 33 per cent), vegetables (64.67 per cent), milk and milk products (96 0 per cent), pulses (24 0 per cent), roots and tubers (70 67 per cent), fruits (95 33 per cent), animal food mainly fish (100 0 per cent) and coconuts (15 33 per cent)

These food articles were not transferred to safe containers but kept in the packets or baskets as collected from the market Such observations were recorded regarding vegetables (23.33 per cent), pulses (24 0 per cent), roots and tubers (2 67 per cent) and coconuts (44.67 per cent) Air tight containers were used only by few families to store cereals (32 0 per cent) and pulses (52.0 per cent) Baskets were used to store vegetables (10 0 per cent) and

Table 17. Storage of the food articles

| icles | Kept in the packets | | | Air tight containers | | | Without cutting | | | Kept in baskets | | | Curdling | | | Soil storage | | | By drying | | | Not stored | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | F | Total | M | F | Total | M | F | Total | M | F | Total | M | F | Total | M | F | Total | M | F | Total | M | F | Total |
| als | 56.0 (42) | 49.33 (37) | 52.66 (79) | 33.33 (25) | 30.66 (23) | 32.00 (48) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10.66 (8) | 20.0 (15) | 15.33 (23) |
| ta- | 24.0 (18) | 22.66 (17) | 23.33 (35) | - | - | - | 2.66 (2) | 1.33 (1) | 2.0 (3) | 13.33 (10) | 6 66 (5) | 10.0 (15) | - | - | - | - | - | - | - | - | - | 60.0 (45) | 69.33 (52) | 64.66 (97) |
| and pro- s | - | - | - | - | - | - | - | - | - | - | - | - | 6.66 (5) | 1.33 (1) | 4.0 (6) | - | - | - | - | - | - | 93.33 (70) | 98.66 (74) | 96.0 (144) |
| es | 20.0 (15) | 28.0 (21) | 24.00 (36) | 60.0 (45) | 44.0 (33) | 52.0 (38) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 20.0 (15) | 28.0 (21) | 24.0 (36) |
| s and rs | - | 5.33 (4) | 2.66 (4) | - | - | - | 32.0 (24) | 10.66 (8) | 21.33 (32) | - | - | - | - | - | - | 9.33 (7) | 1.33 (1) | 5.33 (8) | - | - | - | 58.66 (44) | 82.66 (62) | 70.66 (106) |
| ts | - | - | - | - | - | - | - | - | - | 5.33 (4) | 40 (3) | 4.66 (7) | - | - | - | - | - | - | - | - | - | 94.66 (71) | 96.0 (72) | 95.33 (143) |
| al foods) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100 (75) | 100 (75) | 100 (150) |
| and eeds nut) | 49.33 (31) | 40.00 (30) | 44.66 (61) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 40.0 (30) | 40.0 (30) | 40.0 (60) | 10.66 (8) | 200 (15) | 15.33 (23) |

M - Families of male agricultural labourers
F - Families of female agricultural labourers

fruits (4 67 per cent) Milk was stored as curds by 4 0 per cent families Food articles like roots and tubers were stored under soil by 5 33 per cent of the families and coconut after drying by 40 0 per cent of the failies surveyed

Distribution of families with reference to their daily meal pattern are presented in Table 18

Three meals a day namely breakfast, lunch and dinner and one snack were found to be the common meal pattern of the families surveyed

Table 18 showed that cereal-tea combination were found to be the popular item included in the breakfast (93 34 per cent) However, 5 33 per cent of the families surveyed were found to take tea or coffee alone and 1 33 per cent of the families did not have a breakfast Rice was found to be the main item for lunch Rice and fish along with a vegetable was found to be the common pattern in 52.0 per cent of the families Pulse was included occasionally by 29 33 per cent families Cereal, fish and tapioca (6 67 per cent), cereal and vegetable (11 33 per cent) and cereal, pulses and coconut preparation (0 67 per cent) were also food combinations attempted for lunch

Tea with tapioca (26.0 per cent) was a combination attempted in some of the families during evening tea Breakfast item was also

Table 18 Distribution of families with reference to daily meal pattern

| Food combinations | A | | B | | Total | |
|---|---|---|---|---|---|---|
| | No | % | No | % | No | % |
| Break frast time | | | | | | |
| Cereal + tea | 74 | 98 67 | 66 | 88 0 | 140 | 93 33 |
| Tea/coffe alone | 1 | 1 33 | 7 | 9 33 | 8 | 5 34 |
| Nothing | - | - | 2 | 2 67 | 2 | 1 33 |
| Lunch items | | | | | | |
| Cereal + fish + tapioca | 3 | 4 0 | 7 | 9 33 | 10 | 6 67 |
| Cereal + vegetable | 8 | 10 67 | 9 | 12 0 | 17 | 11 33 |
| Cereal + fish + vegetable | 36 | 48 0 | 42 | 56 0 | 78 | 52 00 |
| Cereal + fish + vegetable + pulse | 28 | 37 33 | 16 | 21 34 | 44 | 29 33 |
| Cereal + pulse + chutney | - | | 1 | 1 33 | 1 | 0 67 |
| Evening tea items | | | | | | |
| Cereal + tea | 9 | 12 00 | 8 | 10 67 | 17 | 11 33 |
| Black coffee | 6 | 8 0 | 5 | 6 67 | 11 | 7 33 |
| Tea + tapioca | 19 | 25 33 | 20 | 26 67 | 39 | 26 00 |
| Tea with milk | 17 | 22 67 | 18 | 24 00 | 35 | 23 34 |
| Coffee + biscuits | 8 | 10 67 | 13 | 17 33 | 21 | 14 00 |
| Tea + vada | 16 | 21 33 | 11 | 14 67 | 27 | 18 00 |
| Dinner items | | | | | | |
| Cereal + fish + tapioca | 27 | 36 00 | 24 | 45 33 | 61 | 40 67 |
| Cereal + fish + vegetable | 45 | 60 00 | 35 | 46 67 | 80 | 53 33 |
| Rice + pulses | 1 | 1 33 | 1 | 1 33 | 2 | 1 33 |
| Rice + fish + vegetable + fruits + milk | 1 | 1 34 | 4 | 5 34 | 5 | 3 33 |
| Rice + vegetable + pappad | 1 | 1 33 | - | - | 1 | 0 67 |
| Kanji + chutney + tapioca | - | | 1 | 1 33 | 1 | 0 67 |

A - Families of male agricultural labourers
B - Families of female agricultural labourers

repeated as snack by 11 33 per cent families Biscuit was purchased for children in 14 0 per cent of the families Tea and fried snacks combinations were also popular among 18 0 per cent families

Cereal-fish combination was a popular dinner constituent among 40 67 per cent families while cereal-vegetable combination was well acceptable to 53 33 per cent families In addition to these two combinations, few families were in the habit of including pulses (1 33 per cent), fruits and milk (3 33 per cent), pappads (0 67 per cent) or coconut preparation (0.67 per cent)

Nutrition during infancy lays the foundation for health A healthy new born baby doubles its birth-weight by the fifth month and triples by one year if an adequate meal is fed

Dietary pattern specially practiced during infancy by the families were collected and are presented in Table 19

As depicted in Table 19, all the women were in the habit of breast feeding their infants. However, along with breastmilk, cows milk were also given to 36 67 per cent of infants 36 67 per cent of the mothers were including cow's milk, ragi and bişcuit in infant's diet In addition, biscuits (6 0 per cent), biscuit and cereal (7.33 per cent), cereal and fruits (2.67 per cent) also found a place in the infants diets. Only 4.67 per cent of the women were not in the habit of supplementing infant food during the first year.

Table 19 Distribution of families with reference to the dietary practices followed during infancy

| Supplementary foods given along with breast milk | A | | B | | Total | |
|---|---|---|---|---|---|---|
| | No | % | No | % | No | % |
| Breast feeding alone | 3 | 4 00 | 4 | 5 33 | 7 | 4 67 |
| Cow's milk | 22 | 29 34 | 33 | 44 00 | 55 | 36 67 |
| Biscuit | 6 | 8.00 | 3 | 4 00 | 9 | 6 00 |
| Biscuit + cereal | 6 | 8 00 | 5 | 6 67 | 11 | 7 33 |
| Cereal + fruit | 4 | 5 33 | - | - | 4 | 2 67 |
| Ragi + biscuit + cow's milk | 34 | 45.33 | 30 | 40 00 | 64 | 42 66 |
| Total | 75 | 100 00 | 75 | 100 00 | 150 | 100 00 |

A - Families of male agricultural labourers
B - Families of female agricultural labourers

Distribution of families with reference to the dietary practices followed during preschool period is presented in Table 20

Along with adult foods, special foods were given to preschool children as presented in Table 20 Food articles generally given were milk with biscuit (42 0 per cent), milk with fruit (0 66 per cent), milk with egg (2.0 per cent) or milk alone (1 33 per cent). In the major meal of the day, viz , lunch and dinner, adult diet was given to preschool children However special foods like egg (2.67 per cent), milk (15 33 per cent), biscuits (69 33 per cent), cereal preparations (6.0 per cent), milk (0 67 per cent), pulses (5.33 per cent), fruits (8.67 per cent) and or roots and tubers (5 33 per cent) were given to preschool children by few families

Distribution of families with reference to the dietary practices followed during school period is presented in Table 21

Table 21 shows the different food combinations given to school going children 98.0 per cent of the families surveyed were given only adult diet to school children No special foods were given.

Distribution of families with reference to the dietary practices followed during adolescent period is presented in Table 22

Table 20. Distribution of the families with reference to the dietary practices followed during preschool period

| Food combinations | Breakfast | | | Lunch | | | Evening tea | | | Dinner | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | Total | A | B | otal | A | B | Total | A | B | Total |
| Tea + cereal | 50.66 (38) | 49.33 (37) | 50 00 (75) | - | - | - | 5 33 (4) | 6.66 (5) | 6 (9) | - | - | - |
| Milk + fruit | 1.33 (1) | - | 0.66 (1) | - | - | - | - | - | - | - | - | - |
| Milk + biscuit | 36.0 (27) | 48.0 (36) | 42 0 (63) | - | - | - | - | - | - | - | - | - |
| Milk + egg | 2 66 (2) | 1.33 (1) | 2 0 (3) | - | - | - | - | - | - | - | - | - |
| Milk | 2 66 (2) | - | 1 33 (2) | - | - | - | 1 33 (1) | - | 0.66 (1) | - | - | - |
| Tea + cereal + pulse | 6.66 (5) | 1 33 (1) | 4 0 (6) | - | - | - | - | - | - | - | - | - |
| Cereal + fish | - | - | - | 20.0 (15) | 9.33 (7) | 14 66 (22) | - | - | - | 25 33 (19) | 29 33 (22) | 21.33 (41) |
| Cereal + vegetable + fish | - | - | - | 53.33 (40) | 73.33 (55) | 63.33 (95) | - | - | - | 56 0 (42) | 50.66 (38) | 53.33 (80) |
| Cereal + vegetable + pulse + | - | - | - | 8.0 (6) | 6.66 (5) | 7.33 (11) | - | - | - | - | - | - |
| Cereal + fish + vegetable + pulse | - | - | - | 18 66 (14) | 10 66 (8) | 14.66 (22) | - | - | - | - | - | - |
| Tea | - | - | - | - | - | - | 9.33 (1) | - | 4.66 (7) | - | - | - |
| Tea + biscuit | - | - | - | - | - | - | 61 33 (46) | 77.33 (58) | 69 33 (104) | - | - | - |
| Tea + pulse | - | - | - | - | - | - | 2 66 (2) | 8 0 (6) | 5 33 (8) | - | - | - |
| Tea + fruit | - | - | - | - | - | - | 10 66 (8) | 6.66 (5 | 8 66 (13) | - | - | - |
| Tea + roots and tubers | - | - | | - | - | - | 9 33 (7) | 1.33 (1) | 5 33 (8) | - | - | - |
| Cereal + egg | - | - | - | - | - | - | - | - | - | 2 66 (2) | 2 66 (2) | 2 66 (4) |
| Cereal + chutney | - | - | - | - | - | - | - | - | - | 2 66 (2) | - | 1.33 (2) |
| Cereal + fish + milk | - | - | - | - | - | - | - | - | - | 13 33 (10) | 17 33 (10) | 15.33 (23) |

Numbers given in parenthesis
A - Families of male agricultural labourers
B - Families of female agricultural labourers

Table 21. Distribution of families with reference to the dietary practices followed during school period

| Food combination | Breakfast | | | Lunch | | | Evening tea | | | Dinner | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | Total | A | B | Total | A | B | Total | A | B | Total |
| ea + bread | 1.33 (1) | 2.66 (2) | 2.0 (3) | - | - | - | - | - | - | - | - | - |
| real + tea | 98.66 (74) | 97.33 (73) | 98.0 (147) | - | - | - | 52.0 (39) | 49.33 (37) | 50.66 (76) | - | - | - |
| ea | - | - | - | - | - | - | 2.66 (2) | 4.0 (3) | 3.33 (5) | - | - | - |
| real + fish | - | - | - | 20.0 (15) | 12.0 (9) | 16.0 (24) | - | - | - | 92.66 (32) | 44.0 (33) | 43.33 (65) |
| real + vegetable | - | - | - | 9.33 (7) | 14.66 (11) | 12.0 (18) | - | - | - | 1.33 (1) | 1.33 (1) | 1.33 (2) |
| real + fish + vegetable | - | - | - | 70.66 (53) | 73.33 (55) | 72.0 (108) | - | - | - | 56.0 (42) | 54.66 (41) | 55.33 (83) |
| ack coffee | - | - | - | - | - | - | 4.00 (3) | - | 2.0 (3) | - | - | - |
| a + fruit | - | - | - | - | - | - | 1.33 (1) | 1.33 (1) | 1.33 (2) | - | - | - |
| a + biscuit | - | - | - | - | - | - | 8.0 (6) | 8.0 (6) | 8.0 (12) | - | - | - |
| a + pulse | - | - | - | - | - | - | 4.0 (3) | 8.0 (6) | 6.0 (9) | - | - | - |
| a + banana | - | - | - | - | - | - | 4.0 (3) | 6.66 (5) | 5.33 (8) | - | - | - |
| a + roots and tubers | - | - | - | - | - | - | 24.0 (18) | 22.66 (17) | 23.33 (35) | - | - | - |

Numbers given in parenthesis
A - Families of male agricultural labourers
B - Families of female agricultural labourers

Table 22. Distribution of families with reference to the dietary practices followed during adolescent period

| Food combinations | Breakfast | | | Lunch | | | Evening tea | | | Dinner | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | Total | A | B | Total | A | B | Total | A | B | Total |
| ack coffee | 9.33 (7) | 5.33 (4) | 7.33 (11) | - | - | - | 4.0 (3) | 2.6 (2) | 3.33 (5) | - | - | - |
| a + cereal | 88.0 (66) | 84.0 (63) | 86.0 (129) | - | - | - | 22.66 (17) | 17.33 (13) | 20.0 (30) | - | - | - |
| a | 2.66 (2) | 10.66 (8) | 6.66 (10) | - | - | - | 36.0 (27) | 37.33 (28) | 36.66 (55) | - | - | - |
| eal + fish | - | - | - | 21.33 (16) | 10.66 (8) | 16.0 (24) | - | - | - | 34.66 (26) | 40.0 (30) | 37.33 (66) |
| eal + pulse | - | - | - | - | 1.33 (1) | 0.66 (1) | - | - | - | - | - | - |
| eal + vegetable | - | - | - | 10 66 (5) | 13.33 (10) | 12.0 (18) | - | - | - | - | 2.66 (2) | 1.33 (2) |
| eal + fish + vegetable | - | - | - | 68.0 (51) | 73.33 (55) | 70.66 (106) | - | - | - | 65.33 (49) | 50.0 (42) | 60 66 (91) |
| hing | - | - | - | - | 1.33 (1) | 0.66 (1) | - | - | - | - | - | - |
| + roots + tubers | - | - | - | - | - | - | 25.33 (19) | 28.0 (21) | 26.66 (40) | - | - | - |
| + pulse | - | - | - | - | - | - | 4.0 (3) | 8.0 (6) | 6.0 (9) | - | - | - |
| + banana | - | - | - | - | - | - | 5.33 (4) | 1.33 (1) | 3.33 (5) | - | - | - |
| + biscuit | - | - | - | - | - | - | 2.66 (2) | 5.33 (4) | 4.0 (6) | - | - | - |
| ji + chutney | - | - | - | - | - | - | - | - | - | - | 1.33 (1) | 0.66 (1) |

Numbers given in parenthesis
A - Families of male agricultural labourers
B - Families of female agricultural labourers

The above table revealed that, the diet given during the adolescent period are as same as the adult diet The families surveyed were not giving any special consideration to their children during adolescent period

Distribution of families with reference to special foods given during pregnancy and lactation other than adult food are presented in Table 23.

In special conditions like pregnancy, lactation etc. it was found that women were given only the normal regular family diet However, certain food articles like milk and fruits (1 33 per cent of the families), root and egg (1 33 per cent of the families), fruits (28.0 per cent of the families) and milk (12 0 per cent of the families) were found to be included in the diets of women during pregnancy period. Unlike this, during lactation period, there was no change in the dietary pattern except in the inclusion of egg (0.67 per cent) and fruits (1.33 per cent) along with normal time diet

Distribution of families with reference to the food prepared for special occasions are presented in Table 24

Birth days, marriage and festivals are the important occasions when special items in the daily meal were included During these occasions, vegetarian preparations were found to be preferred Only

Table 23. Special foods given during pregnancy and lactation other than adult food

| Food items | Pregnancy | | | | | | Lactation | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | | B | | Total | | A | | B | | Total | |
| | No. | % | No. | % | No. | % | No | % | No. | % | No. | % |
| Milk + fruits | - | - | 2 | 2.66 | 2 | 1.33 | - | - | - | - | - | - |
| Egg | - | - | 2 | 2.66 | 2 | 1.33 | - | - | 1 | 1.33 | 1 | 0.66 |
| Fruits | 23 | 30.66 | 19 | 25.33 | 42 | 28.0 | 2 | 2.66 | - | - | 2 | 1.33 |
| Milk | 12 | 16.0 | 12 | 16.0 | 24 | 12.0 | - | - | - | - | - | - |

A - Families of male agricultural labourers
B - Families of female agricultural labourers

Table 24. Diet for special occasions

| nations | Birth days | | | | | | Marriage | | | | | | Festivals | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | | B | | Total | | A | | B | | Total | | A | | B | | Total | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No | % | No. | % |
| al + le + appad | 53 | 70.66 | 48 | 64.0 | 101 | 67.33 | 69 | 92.0 | 69 | 92.0 | 138 | 92.0 | 11 | 14.66 | 14 | 18.66 | 25 | 16.6 |
| al + ppad | 19 | 25.33 | 17 | 36.0 | 46 | 30.66 | 1 | 1.33 | - | - | 1 | 0.66 | 11 | 14.66 | 15 | 20.0 | 26 | 17.3 |
| l + d | 1 | 1.33 | - | - | 1 | 0.66 | - | - | - | - | - | - | - | - | - | - | - | - |
| l + asam | 2 | 2.66 | - | - | 2 | 1.33 | - | - | - | - | - | - | 2 | 2.66 | - | - | 2 | 1.3 |
| l + d + ckle + | - | - | - | - | - | - | 5 | 6.66 | 6 | 8.0 | 11 | 7.33 | - | - | - | - | - | - |
| l + d + | - | - | - | - | - | - | - | - | - | - | - | - | 49 | 65.33 | 45 | 60.0 | 94 | 62.66 |
| l + meat | - | - | - | - | - | - | - | - | - | - | - | - | 2 | 2.66 | 1 | 1.33 | 3 | 2.0 |

Families of male agricultural labourers
Families of female agricultural labourers

very few families (2 67 per cent) prepared nonvegetarian dishes on such occasions because of their dietary habit Additional preparation with vegetables, pulses, curd, pickle, pappad, payasam, fried foods etc were found to change the normal pattern of their diet during special occasions

Distribution of families with reference to the foods given during illness presented in Table 25

Normal meal pattern was changed during cough (67 0 per cent), fever (73 33 per cent), diarrhoea (74 67 per cent), cholera (50.0 per cent), smallpox (56.67 per cent) and chickenpox (53.33 per cent) with rice gruel alone Bread and rice gruel, bread and milk were the other special foods given during these occasions

Distribution of families with reference to the serving pattern followed by the families is presented in Table 26

Majority of the families (84.0 per cent) surveyed were found to give preference to the head of the family either a male or female. In 12.0 per cent of the families, preference was given to the male children, equal importance was given to the head of the family and small child (1 33 per cent) or to the head of the family and adult male child (0 67 per cent)

Table 25. Diet during Illness

| Diseases | Food combinations | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rice gruel | | | Bread + rice gruel | | | Bread | | | Milk + bread | | |
| | A | B | Total | A | B | Total | A | B | Total | A | B | Total |
| Cough | 68.0 (51) | 64.0 (48) | 66.0 (99) | 18.66 (14) | 32.0 (24) | 25.33 (38) | 2.66 (2) | - | 1.33 (2) | 10.66 (8) | 4.0 (3) | 7.33 (11) |
| Fever | 80.0 (60) | 66.66 (50) | 73.33 (110) | 14.66 (11) | 30.66 (23) | 22.66 (34) | 2.66 (2) | - | 1.33 (2) | 2.66 (2) | 2.66 (2) | 2.66 (4) |
| Diarrhoea | 80.0 (60) | 69.33 (52) | 74.66 (112) | 14.66 (11) | 25.33 (19) | 20.0 (30) | - | - | - | 5.33 (4) | 5.33 (4) | 5.33 (8) |
| Cholera | 46.66 (35) | 53.33 (40) | 50.0 (75) | 40.0 (30) | 42.66 (32) | 41.33 (62) | 5.33 (4) | 2.66 (2) | 4.0 (6) | 8.0 (6) | 1.33 (1) | 4.66 (7) |
| Smallpox | 58.66 (44) | 54.66 (41) | 56.66 (85) | 28.0 (21) | 38 66 (29) | 33.33 (50) | 5.33 (4) | 5.33 (4) | 5.33 (8) | 8.0 (6) | 1.33 (1) | 4.66 (7) |
| Chickenpox | 53.33 (40) | 53.33 (40) | 53.33 (80) | 33.33 (25) | 37.33 (28) | 35.33 (53) | 5.33 (4) | 5.33 (4) | 5.33 (8) | 8.0 (6) | 4.0 (3) | 6.00 (9) |

Numbers given in parenthesis
A - Families of male agricultural labourers
B - Families of female agricultural labourers

Table 26. Distribution with reference to the serving pattern

| Members | A | | B | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Head of the family | 74 | 98.67 | 52 | 69 33 | 126 | 84 00 |
| Head of the family + small child | - | - | 2 | 2.67 | 2 | 1.33 |
| Head of the family + adult male child | - | - | 1 | 1 33 | 1 | 0 67 |
| Children (Male) | 1 | 1 33 | 17 | 22 67 | 18 | 12 00 |
| Total | 75 | 100.00 | 75 | 100.00 | 150 | 100.00 |

A - Families of male agricultural labourers
B - Families of female agricultural labourers

**3. Personal characteristics of the agricultural labourers**

The well being of the members of a family will be influenced by the personal characteristics of the wage earners of the family Hence, the personal characteristics of the agricultural labourers were assessed with special reference to their age, educational level, marital details, health status of the family members, daily work pattern, daily meal pattern and their unhealthy habits

Distribution of the agricultural labourers with reference to their age is given in Table 27

As depicted in Table 27, respondents selected for the study were in the age range of 20 to 65 years 34 67 per cent of the respondents were in the age group of 36 to 40 years and 20 67 per cent in the age group of 41 to 55 years Few respondents (12 0 per cent) were in the age group of 31 to 35 years 76 0 per cent of the female labourers were in the reproductive period

Distribution of the agricultural labourers with reference the educational status is presented in Table 28

The educational status of the agricultural labourers given in Table 28 showed that, 34.67 per cent among male agricultural labourers and 60 0 per cent among female agricultural labourers were illiterate 33.33 per cent among male agricultural labourers and 26 67 per cent of the female agricultural labourers were found to have studied upto lower primary school level and 26 67 per

Table 27 Age wise distribution of the agricultural labourers

| Age (in yrs) | Male respondents | | Female respondents | | Total | |
|---|---|---|---|---|---|---|
| | Number | Per cent | Number | Per cent | Number | Per cent |
| 20-30 | 4 | 5.33 | - | - | 4 | 2.67 |
| 31-35 | 3 | 4 00 | 15 | 20.00 | 18 | 12 00 |
| 36-40 | . 22 | 29.34 | 30 | 40 00 | 52 | 34 67 |
| 41-45 | 19 | 25 33 | 12 | 16 00 | 31 | 20 67 |
| 46-50 | 12 | 16.00 | 12 | 16 00 | 24 | 16 00 |
| 51-55 | 9 | 12.00 | 4 | 5 33 | 13 | 8 66 |
| 56-60 | 2 | 2 67 | 1 | 1.34 | 3 | 2 00 |
| 61-65 | 4 | 5.33 | 1 | 1 33 | 5 | 3 33 |
| Total | 75 | 100.00 | 75 | 100.00 | 150 | 100.00 |

Table 28 Distribution of the agricultural labourers with reference to their Educational status

| Educational status | Male respondents | | Female respondents | | Total | |
|---|---|---|---|---|---|---|
| | Number | Per cent | Number | Per cent | Number | Per cent |
| Lower primary school level | 25 | 33 33 | 20 | 26 67 | 45 | 30 00 |
| Upper primary school level | 20 | 26 67 | 4 | 5 33 | 24 | 16 00 |
| High school level | 4 | 5.33 | 6 | 8 00 | 10 | 6 67 |
| Illiterate | 26 | 34 67 | 45 | 60 00 | 71 | 47 33 |
| Total | 75 | 100.00 | 75 | 100 00 | 150 | 100 00 |

cent of the male agricultural labourers and 5 33 per cent of the female agricultural labourers had studied upto upper primary school level Only 6 67 per cent (5.33 per cent male agricultural labourers and 8.0 per cent female agricultural labourers) of the labourers were found to have studied upto high school level

Marital status of the agricultural labourers were determined on the basis of the year of marriage. Male labourers were found to be married between the age of 20 to 28 years. In the case of female labourers, 24.0 per cent were married below 16 years and the remaining 76 0 per cent were married between the age group of 17 and 26 years

Compared to other income groups women belonging to low income strata were observed to ignore their health condition In this study also in 38.67 per cent families women had suffered due to miscarriages/abortions. However, women were conscious of the health status of their children. Among the 150 respondents, 86 0 per cent of the respondents were aware of the optimum health status of their children. Major determinants for optimum health status of the children were reported to be occurance of disease like frequent diarrhoea, fever, pneumonia, spots with pus, heart trouble and polio.

The parents in general were found to be aware of the significance of giving immunization to children at prescribed times

Since in 70 67 per cent of the family, children were found to be immunized.

Morbidity status of the children were determined by ascertaining the prevalence of various types of diseases among children during survey period and the details are presented in Table 29

Table 29 depicted that in 57 67 per cent of the families, children had suffered from diseases like fever (20 67 per cent) and diarrhoea (19 33 per cent), jaundice (5 33 per cent), chickenpox (3.33 per cent), jaundice along with fever (0 67 per cent), diarrhoea with chickenpox (2 0 per cent) and spot with pus (2.0 per cent).

The findings of the survey further revealed that, parents (96.57 per cent) preferred allopathic treatment for all the above diseases 65 67 per cent of the respondents were satisfied with their health condition and allopathic consultation was preferred by 98.0 per cent of the respondents

Many of the houses of the labourers were located far away from the farms and the fields in which they were working Information on the daily work pattern of these labourers were collected **Distance between** the home and work place is a major factor influencing the work pattern of an individual. Such details, collected, are presented in Table 30.

Table 29 Morbidity status of the children in the families surveyed

| Disease | Details of families | | | | | |
|---|---|---|---|---|---|---|
| | A | | B | | Total | |
| | Number | Per cent | Number | Per cent | Number | Per cent |
| Jaundice | 4 | 5.33 | 4 | 5.33 | 8 | 5 33 |
| Chickenpox | 4 | 5.34 | 1 | 1 34 | 5 | 3.33 |
| Fever | 15 | 20 00 | 16 | 21 33 | 31 | 20 67 |
| Diarhoea | 15 | 20.00 | 14 | 18.67 | 29 | 19 33 |
| Jaundice + fever | 1 | 1 33 | - | - | 1 | 0 67 |
| Diarhoea + chickenpox | 3 | 4 00 | - | - | 3 | 2 00 |
| Spot with pus | 3 | 4.00 | - | - | 3 | 2 00 |
| Heart trouble | - | - | - | - | - | - |
| Nothing | 30 | 40.00 | 40 | 33 33 | 69 | 46 67 |
| Total | 75 | 100 00 | 75 | 100 00 | 150 | 100 00 |

A - Families of male agricultural labourers
B - Families of female agricultural labourers

Table 30 Distribution of agricultural labourers with reference to the distance between their home and work place

| Distance in kilometres | Male respondents | | Female respondents | | Total | |
|---|---|---|---|---|---|---|
| | Number | Per cent | Number | Per cent | Number | Per cent |
| 1 | 23 | 30.67 | 23 | 30 67 | 40 | 30 67 |
| 1-1½ | 24 | 32.00 | 19 | 25 33 | 43 | 28 67 |
| 1½-2 | 12 | 16 00 | 17 | 22 67 | 29 | 19 33 |
| 2-2½ | 5 | 6.67 | 4 | 5 33 | 9 | 6 00 |
| 2½-3 | 6 | 8.00 | 5 | 6 67 | 11 | 7 33 |
| Above 3 | 5 | 6 67 | 7 | 9 33 | 12 | 8 00 |
| Total | 75 | 100.00 | 75 | 100 00 | 150 | 100 00 |

As revealed in the table, 78 67 per cent of the labourers were residing in an area within two kilometres from their working place. While the remaining respondents (21 34 per cent) to cover 2 to 5 kilometres every day to reach their place of work

Time taken to reach the work place were varying considerably among the respondents

Time required for travelling to the place of work was assessed and is presented in Table 31

As depicted in Table 31, 42.0 per cent of the labourers of which 38.67 per cent males and 45 33 per cent were females took 15 minutes to reach the work place 48 0 per cent of the labourers of which, 50 67 per cent were males and 45.33 per cent were females, took 15 to 30 minutes and 7.33 per cent of the labourers of which, 5.33 per cent were males and 9 33 per cent were females took 31 to 45 minutes and only 5.33 per cent of the male labourers took 45 to 60 minutes to reach their place of work. In general, male labourers were found to take more time to reach their place of work

Only 7.33 per cent of the labourers (4.0 per cent male labourers and 10.67 per cent female labourers) were using conveyance like public transport to reach their place of work 9 33 per cent of the male labourers were travelling by cycle to their

place of work. On an average 9 hours were spent at work place by the labourers and one hour interval was taken for lunch and rest

The employment for agricultural labourers is seasonal Hence the frequency of getting employment in a month by the respondents were assessed and the results are presented in Table 32

As depicted in Table 32, 88 67 per cent of the labourers (89.33 per cent males and 88.0 per cent females) were getting employment for 24 days in a month. Frequency of getting employment for the remaining labourers were less. It was 12 days for 2 0 per cent of the labourers, 16 days for 3.33 per cent of the labourers and 20 days for 2 67 per cent of the labourers. Among the respondents, only 3 33 per cent of the labourers were getting employment for 28 days.

Compared to male labourers, female labourers were getting employment for less number of days. Assessment of total number of days without work in a month revealed that majority of the respondents (88 67 per cent) were without work in a month, only for 6 days.

Tenure of service of the agricultural labourers were assessed and is given in Table 33.

Table 32 Distribution of agricultural labourers with reference to the freqency of getting employment in a month

| Cooking days | Male respondents | | Female respondents | | Total | |
|---|---|---|---|---|---|---|
| | Number | Per cent | Number | Per cent | Number | Per cent |
| 12 | 1 | 1 33 | 2 | 2.67 | 3 | 2 00 |
| 16 | 2 | 2.67 | 3 | 4.00 | 5 | 3 33 |
| 20 | 1 | 1 33 | 3 | 4 00 | 4 | 2 67 |
| 24 | 67 | 89 34 | 66 | 88 00 | 133 | 88 67 |
| 28 | 4 | 5.33 | 1 | 1 33 | 5 | 3 33 |
| Total | 75 | 100 00 | 75 | 100 00 | 150 | 100 00 |

Table 33 shows that, 90 0 per cent of the labourers of which 86.67 per cent were males and 93 33 per cent were females, had more than 17 years tenure while 7 33 per cent (of which 10 67 per cent were males and 11.0 per cent were females) had 9 to 16 years. Only 2 67 per cent of the labourers had 5 to 8 years tenure

Household activities other than the main occupation taken up by the labourers are presented in Table 34

The above table revealed that, major activity of the female agricultural labourers at the domestic level were cooking (68 0 per cent). Besides cooking, other activities undertaken by the female labourers were child care, collection of water, animal care and help other family members to do their responsibilities

Male respondents were more engaged in animal husbandry activities (33 33 per cent). Male agricultural labourers were also engaged in child care, collection of water and fuel and household agricultural operations. Compared to female agricultural labourers (2 67 per cent) more number of male agricultural labourers (30 67 per cent) were refraining from household responsibilities

When women go out for work, it generally affects the normal running of various domestic chores Hence without the support of other members in the family, many a times the housewife finds it difficult to run the home

Table 31 Distribution of agricultural labourers with reference to the time spent to reach the work place

| Time in minutes | Male respondents | | Female repondents | | Total | |
|---|---|---|---|---|---|---|
| | Number | Per cent | Number | Per cent | Number | Per cent |
| 15 | 29 | 38.67 | 34 | 45 33 | 63 | 42 00 |
| 16-30 | 38 | 50.67 | 34 | 45 34 | 72 | 48 00 |
| 31-45 | 4 | 5.33 | 7 | 9 33 | 11 | 7 33 |
| 46-60 | 4 | 5 33 | - | - | 4 | 2 67 |
| Total | 75 | 100.00 | 75 | 100 00 | 150 | 100 00 |

Table 33 Distribution of agricultural labourers with reference to their tenure of service

| Number of years | Male respondents | | Female respondents | | Total | |
|---|---|---|---|---|---|---|
| | Number | Per cent | Number | Per cent | Number | Per cent |
| 5-8 | 2 | 2 67 | 2 | 2 67 | 4 | 2 67 |
| 9-16 | 8 | 10 67 | 3 | 4 00 | 11 | 7 33 |
| Above 17 | 65 | 86.66 | 70 | 93 33 | 135 | 90 00 |
| Total | 75 | 100.00 | 75 | 100 00 | 150 | 100 00 |

Table 34. Distribution of agricultural labourers with reference to involvement in household activities

| Activities | Male respondents | | Female respondents | |
|---|---|---|---|---|
| | Number | Per cent | Number | Per cent |
| Food preparation | - | - | 51 | 68 00 |
| Child care + food preparation | - | - | 7 | 9 33 |
| Child care | 6 | 8 00 | - | - |
| Carry water + child care | 1 | 1 33 | 2 | 2 67 |
| Carry water + child care + food preparation | - | - | 4 | 5 33 |
| Carry water + wood collection | 5 | 0 67 | - | - |
| Milking and selling | 4 | 5 33 | - | - |
| Animal care | 25 | 33 34 | 5 | 6 67 |
| Household agricultural operation | 77 | 9 33 | - | - |
| Business | 3 | 4 00 | - | - |
| Salesman | 1 | 1 37 | - | - |
| Help other family members | - | - | 4 | 5 33 |
| Nothing | 23 | 30.66 | 2 | 2 67 |
| Total | 75 | 100 00 | 75 | 100 00 |

Compared to the families of male agricultural labourers (67.67 per cent) more female agricultural labourers (73 34 per cent) sought help from other family members 26 67 per cent of the females managed their domestic chores by themselves without assistance from other family members In the families of female agricultural labourers, sisters, elder male child, husband, elder female child and sister-in-law played a vital role.

Subsidiary occupations undertaken by the labourers generally helped to increase the economic status and the social status of the families. In majority of the families, main wage earner of the family was undertaking the subsidiary occupations especially during the lean periods

Among the 150 labourers surveyed, only 1 33 per cent male labourers each had taken up additional occupation Major activities thus undertaken were milking animals in other families, running small hotels and functioning as watcher, salesman or as a worker, in stone breaking job Subsidiary occupation chosen by the female labourers was as a domestic servant generally taken are to work before their usual work time Time spent in subsidiary occupations per day by the labourers on an average were less than 4 hours

Smoking, betel chewing, alcoholism and using snuff powder were the main unhealthy habits noticed among the labourers and the details collected in this regard are presented in Table 35

Table 35 Distribution of agricultural labourers with reference to their unhealthy habits

| Unhealthy habits | Male respondents | | Female respondents | | Total | |
|---|---|---|---|---|---|---|
| | Number | Per cent | Number | Per cent | Number | Per cent |
| Betel chewing | 8 | 10 67 | 55 | 73 33 | 63 | 42 00 |
| Smoking | 14 | 18 67 | 4 | 5 34 | 18 | 12 00 |
| Tobacco chewing | 1 | 1 33 | 1 | 1 33 | 2 | 1 33 |
| Using snuff powder | 4 | 5.33 | - | - | 4 | 2 67 |
| Alcoholism + betel chewing | 1 | 1 33 | - | - | 1 | 0 67 |
| Alcoholism + smoking | 8 | 10 67 | - | - | 8 | 5 33 |
| Smoking + betel nut chewing | 12 | 16 00 | 3 | 4 00 | 15 | 10 00 |
| Smoking + tobacco chewing | - | - | 1 | 1 33 | 1 | 0 67 |
| Alcoholism + smoking + betel chewing | 20 | 26 67 | - | - | 20 | 13 33 |
| Snuffing + smoking | 1 | 1.33 | - | - | 1 | 0 67 |
| Nothing | 6 | 8.00 | 11 | 14 67 | 17 | 11 33 |
| Total | 75 | 100.00 | 75 | 100.00 | 150 | 100.00 |

As shown in Table 35, among the 150 labourers surveyed, 42 0 per cent of the labourers (10 67 per cent male and 73 33 per cent females) were in the habit of betel chewing and 12.0 per cent of the labourers (18.67 per cent males and 5.33 per cent females) were in the habit of smoking. 1.33 per cent of the male as well as female agricultural labourers were in the habit of tobacco chewing Using snuff powder was a habitual trait among 5 33 per cent male agricultural labourers

26.0 per cent male agricultural labourers and 80.0 per cent female agricultural labourers were addicted to only one type of unhealthy habit, while 29.33 per cent male agricultural labourers and 5 33 per cent female agricultural labourers were addicted to two types of unhealthy habits Three types of unhealthy habits were observed among 26 67 per cent male agricultural labourers

Dietary pattern of the agricultural labourers was assessed with regard to their dietary habits, type of meals taken and inclusion of snacks between meals All the labourers (male as well as females) were habitually nonvegetarians Foods taker at the work place by the agricultural labourers are presented in Table 36

As revealed in the table, 8 0 per cent of the male agricultural labourers and 6.67 per cent of the female agricultural labourers were in the habit of taking their morning meal from shops near the work place. Similarly lunch was also taken from home by 84 0

Table 36. Distribution of agricultural labourers with reference to the foods taken at the work place

| | Breakfast | | | | Lunch | | | | Evening snack | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male respondents | | Female respondents | | Male respondents | | Female respondents | | Male respondents | | Female respondents | |
| | Number | Per cent | Number | Per cent | Number | Per cent | Number | Per cent | Number | Per cent | Number | Per cent |
| From home | 69 | 92.0 | 70 | 93 33 | 63 | 84 0 | 68 | 90 67 | 12 | 16 00 | 23 | 30 67 |
| From near the work place | 6 | 8.0 | 5 | 6 67 | 12 | 16 0 | 7 | 9 33 | 57 | 76 00 | 49 | 65 33 |
| Nothing | - | - | - | - | - | - | - | - | 6 | 8 00 | 3 | 4 0 |
| Total | 75 | 100 0 | 75 | 100 00 | 75 | 100 0 | 75 | 100 00 | 75 | 100 00 | 75 | 100 00 |

per cent male labourers and 90 67 per cent female labourers For lunch also, 16 0 per cent male agricultural labourers and 9 33 per cent female agricultural labourers depended on shops available near work place

Evening snack was not taken by 8.0 per cent male agricultural labourers and 4 0 per cent female agricultural labourers Majority of the labourers (75 99 per cent male labourers and 65 33 per cent female labourers) were in the habit of taking evening snacks from near the work place These foods were taken, over and above the regular home meal For evening snack also, 16 0 per cent male agricultural labourers and 30 67 per cent female agricultural labourers were depending on home meal

Type of refreshments taken in between meals by the labourers are presented in Table 37

Table 37 reveals the type of refreshments taken in between meals by the labourers 34 67 per cent of the labourers were in the habit of taking coffee alone and 33.99 per cent labourers were taking snacks along with tea Snacks generally taken were fried preparations (18 0 per cent), bakery products (14 67 per cent) and fruits (1 33 per cent) 31 33 per cent of the labourers did not have any refreshment in between meals

Table 37 Distribution of agricultural labourers with reference to the type of refreshments taken at work place

| Type of snacks | Male respondents | | Female respondents | | Total | |
|---|---|---|---|---|---|---|
| | Number | Per cent | Number | Per cent | Number | Per cent |
| Black coffee | 6 | 8 00 | 5 | 6 67 | 11 | 7 33 |
| Tea alone | 17 | 22.67 | 24 | 32.00 | 41 | 27.34 |
| Tea + fried items | 16 | 21.33 | 11 | 12.67 | 27 | 18.00 |
| Tea + baked items | 8 | 10.67 | 14 | 18 67 | 22 | 14.67 |
| Tea + fruits | 2 | 2 67 | - | - | 2 | 1 33 |
| Nothing | 26 | 34 67 | 21 | 28.00 | 47 | 31 33 |
| Total | 75 | 100.00 | 75 | 100.00 | 150 | 100.00 |

**4. Specific problems and occupational hazards faced by the agricultural labourers**

Specific problems and occupational hazards are also faced by the agricultural labourers especially by women with reference to their job and health condition Problem faced by the working women during pregnancy and lactating period and while rearing the children are unique.

Occasions during which the respondent did not go to the job were assessed and found that either a deviation in routine domestic chores due to a guest at home (5.33 per cent), a sudden sickness of family members (3 33 per cent) or illness of the respondent himself/herself (46 0 per cent) were the major reasons for refraining from work

Table 38 shows the difficulties confronted by the labourers due to their outside work

Among those who responde d, 16 67 per cent of the agricultural labourers (of which 20 0 per cent were males and 13 67 per cent females) expressed deterioration of personal health due to lack of rest while 8.0 per cent female agricultural labourers were finding it extremely difficult to cope up with the external work and duties

Among the 150 labourers surveyed, 38 67 per cent responded that, outside work had negatively influenced their health condition Compared to male labourers (33 33 per cent), more female labourers (44 0 per cent) had expressed this view

Table 38 Distribution of agricultural labourers with reference to the problems faced due to work outside the home

| Particulars | Male respondents | | Female respondents | | Total | |
|---|---|---|---|---|---|---|
| | Number | Per cent | Number | Per cent | Number | Per cent |
| Lack of health + Improper rest | 15 | 20 00 | 10 | 13 33 | 25 | 16 67 |
| Too much of household work | - | - | 6 | 8 00 | 6 | 4 00 |
| Nothing | 60 | 80 00 | 59 | 78 67 | 119 | 78 33 |
| Total | 75 | 100 00 | 75 | 100.00 | 150 | 100 00 |

Particulars related to job satisfaction attained by the respondents due to outside job are presented in Table 39

Among the 150 labourers surveyed, 9 33 per cent male agricultural labourers and 41 33 per cent female agricultural labourers did not comment about their job Only 2 67 per cent female agricultural labourers were found to be satisfied with their job, because they were free from domestic problems Negligence to child care activity had caused a negative reaction about work from 1 33 per cent female agricultural labouers However, economic independence gained, had created a great sense of satisfaction among 90 67 per cent male agricultural labourers and 54 67 per cent female agricultural labourers

Among the 75 female agricultural labourers surveyed, 78 67 per cent of the women were not affected by any problem because of their outside work But 8 0 per cent of the female agricultural labourers were finding it extremely difficulty to cope up with the household work along with the outside work 13 33 per cent of the female agricultural labourers were complaining about their health because of the outside work

It was reported that during pregnancy period, women employed outside suffered both mentally and physically Finding of the present study also revealed that, 93 33 per cent of the female agricultural labourers were working outside their home during the

Table 39 Distribution of agricultural labourers with reference to the job satisfaction

| Particulars | Male respondents | | Female respondents | | Total | |
|---|---|---|---|---|---|---|
| | Number | Per cent | Number | Per cent | Number | Per cent |
| Satisfied because they are free from domestic problems | - | - | 2 | 2 67 | 2 | 1 33 |
| Satisfied because of economic advantages | 68 | 90.67 | 41 | 54 67 | 109 | 72 67 |
| Dissatisfied being an young mother | - | - | 1 | 1 33 | 1 | 0 67 |
| No opinion | 7 | 9 33 | 31 | 41 33 | 38 | 25 33 |
| Total | 75 | 100 00 | 75 | 100 00 | 150 | 100 00 |

pregnancy period upto 9 months Only 1 33 per cent of the women refrained from outside work for 3 to 5 months and 4 0 per cent of the female agricultural labourers, for 5 to 7 months

Regarding the work, during the lactating period, 97 33 per cent of the female agricultural labourers were engaged in the outside employment without interruption to their additional biological responsibilities. Among these, 88 0 per cent of the female agricultural labourers took 61 to 90 days rest after delivery before starting outside job while 9 33 per cent of female agricultural labourers took only 51 to 60 days rest Only 1 33 per cent of the women had refrained from work for more than 90 days rest after delivery.

In the present study, children's response towards mother's employment outside was assessed on the basis of the views of the female agricultural labourer her self and it was found that 94 67 per cent of the women expressed that their children had a positive response towards their employment outside home

The influence of employment outside home of the mother on the infant feeding practices revealed that, mothers (97 33 per cent) when they had young children were in the habit of leaving the children in the home and were not in the habit of breast feeding them, in between the working hours

When the breast feeding was withdrawn the child was left at home under the elder children in the family (97.33 per cent)

Only very few women, who had no such family support, left their children with the neighbours

**Food intake, energy expenditure and nutritional status of the agricultural labourers**

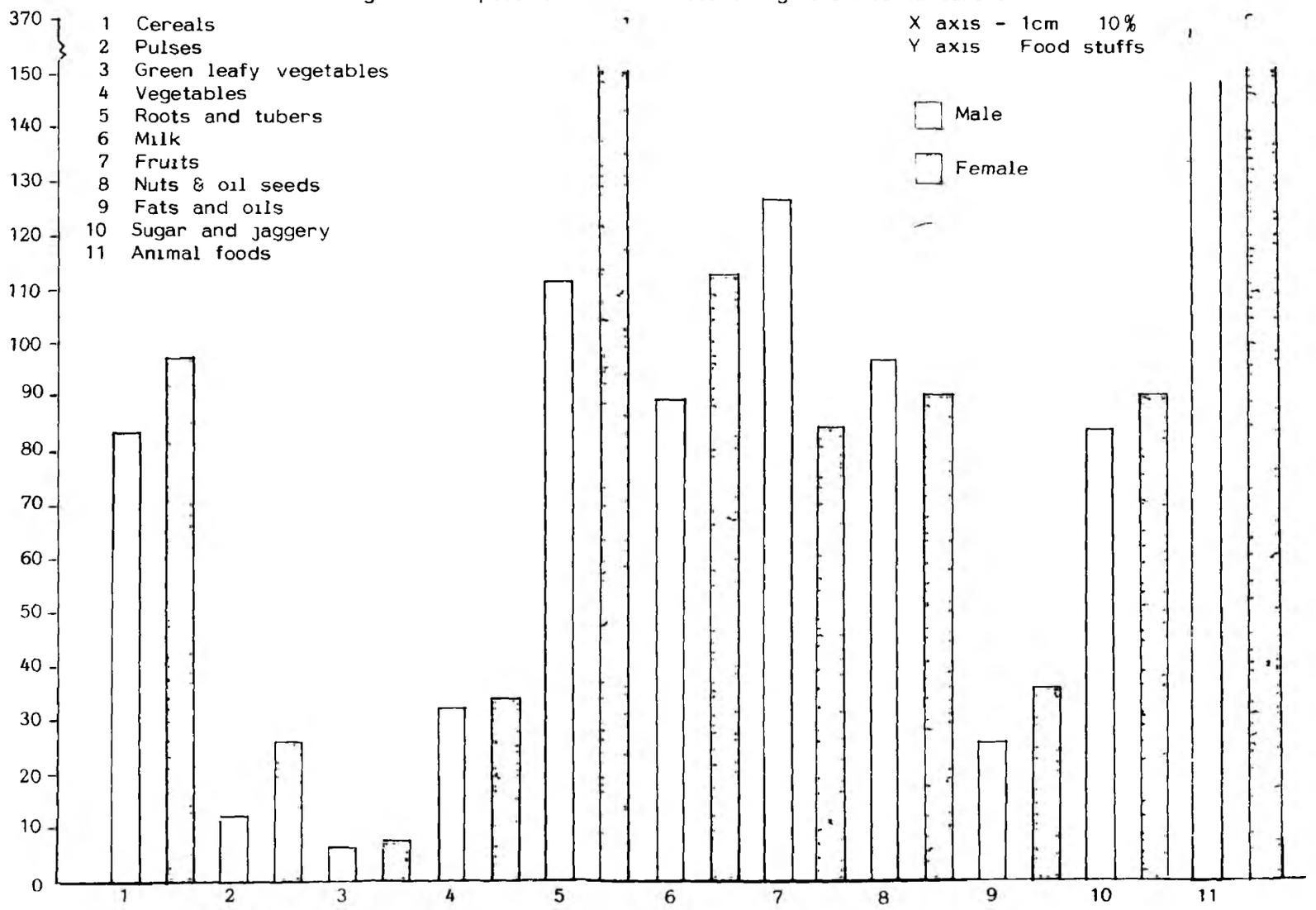
The actual food intake of 20 labourers (10 male labourers and 10 female labourers) were determined by weighment method to assess the quantity and quality of the foods consumed and the results are presented in Table 40 Quantity of each food item was compared with the quantity specified in a balanced diet

The average food intake revealed that food articles like cereals, roots and tubers, milk and milk products, fruits, nuts and oil seeds, sugar and jaggery and fish were included to meet 80 0 per cent of the quantity suggested in a balanced diet Green leafy vegetables and egg were not included in sufficient quantities since only 10 0 per cent of the prescribed amount are met from the family diet However, there is variation in the consumption pattern of food articles like other vegetables, fats and oils and pulses between the two groups Compared to male agricultural labourers, female agricultural labourers were found to include less quantity of food articles like cereals, other vegetables, fruits, nuts and oil seeds, sugar and jaggery and animal foods mainly fish On the other hand food articles like pulses, green leafy vegetables, roots and tubers, milk and milk products and fats and oils were

Table 40 Actual food intake of the labourers estimated by weighment method

| Food stuffs | Male agricultural labourers | | | Female agricultural labourers | | |
|---|---|---|---|---|---|---|
| | Quantity prescribed as per balanced diet (g) | Quantity (g) | Percentage of RDA met | Quantity prescribed as per balanced diet (g) | Quantity (g) | Percentage of RDA met |
| Cereals (rice) | 475 | 394 0 | 82.94 | 350 | 335.3 | 95.71 |
| Pulses | 60 | 11 4 | 20 00 | 55 | 14.3 | 25.45 |
| Green leafy vegetables | 125 | 5.7 | 6 40 | 125 | 10 0 | 8.00 |
| Other vegetables | 75 | 32.1 | 42 66 | 75 | 25.3 | 34.66 |
| Roots and tubers | 100 | 111.3 | 111.00 | 75 | 125 1 | 184 00 |
| Milk and milk products | 100 | 89.0 | 89.00 | 100 | 112 9 | 112.90 |
| Fruits | 30 | 38 1 | 126.66 | 30 | 25 1 | 83.33 |
| Nuts and oil seeds | 30 | 28 6 | 96.66 | 30 | 27 2 | 90 00 |
| Fats and oils | 30 | 86.9 | 26.66 | 25 | 87 0 | 36 00 |
| Sugar and jaggery | 30 | 25 4 | 83 33 | 30 | 25 2 | 90 00 |
| Animal foods (fish) | 30 | 111 3 | 370 00 | 30 | 103 3 | 350 00 |
| Egg | 30 | - | - | 15 | - | - |

Fig 1 Composition of the diets of agricultural labourers



found in greater amounts in the daily diets of these female labourers.

Nutrient intake of the labourers

The nutrients present in the meals were calculated using food composition tables (ICMR, 1987) and results are presented in Table 41

The average nutrient intake of the agricultural labourers revealed that, more than 80 0 per cent of the requirements are met for all the nutrients except retinol and riboflavin in consumption of fat, calcium, niacin and vitamin C were found to be higher than the requirement. The consumption pattern was more or less adequate probably because the study was conducted during harvest season Similar results were reported by Panikar (1979) who had conducted studies among Kuttanad agricultural labourers of Alleppey District Their findings also indicated that harvesting season in the locality, labour households irrespective of age or sex were employed and it increased the wages These factors favourably affected the level of food intake.

The statistical interpretation of the comparison of the average intake of food stuffs to the recommended level are presented in Table 42

Statistical treatment revealed that the quantity of food articles like pulses, green leafy vegetables, other vegetables and fats

Table 41. Nutrient intake of the labourers estimated by weighment method

| Nutrients | Male agricultural labourers | | | Female agricultural labourers | | |
|---|---|---|---|---|---|---|
| | RDA | Quantity | Percentage of RDA met | RDA | Quantity | Percentage of RDA met |
| Protein (g) | 60 | 58 41 | 97 35 | 50 | 52 66 | 103 96 |
| Fat (g) | 15 | 28.046 | 186.97 | 15 | 28 343 | 186.94 |
| Energy (kcal) | 2700 | 2126 | 78.73 | 2100 | 1894.8 | 90.22 |
| Calcium (mg) | 400 | 411.44 | 102.86 | 400 | 379.19 | 94.53 |
| Iron (mg) | 28 | 23 03 | 82 25 | 30 | 21.199 | 70.66 |
| Retinol (µg) | 600 | 126.94 | 21.15 | 600 | 124 366 | 20.72 |
| Thiamine (mg) | 1.4 | 1.043 | 74.53 | 1.1 | 0.9192 | 83.50 |
| Riboflavin (mg) | 1.6 | 0.6280 | 39.32 | 1 3 | 0 6594 | 45 73 |
| Niacin (mg) | 18 | 18.66 | 103.71 | 14 | 15 97 | 114 08 |
| Vitamin C (mg) | 40 | 56 91 | 131 13 | 40 | 58 55 | 146 38 |

Fig 2 Nutritional composition of the diet of agricultural labourers

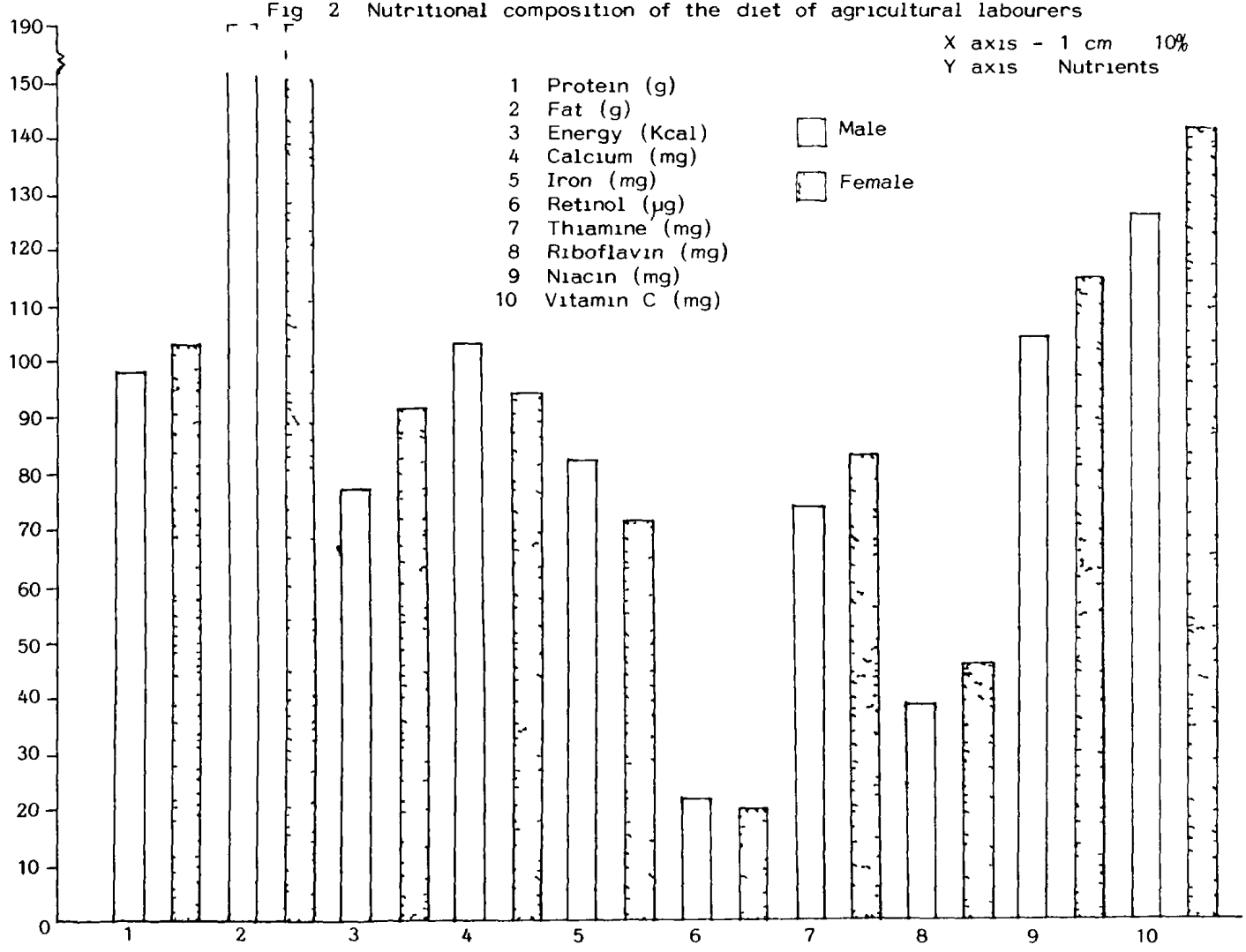


Table 42 t value for RDA of food stuffs and the average intake of food stuffs

| Food stuffs | Male agricultural labourers | | | | Female agricultural labourers | | | |
|---|---|---|---|---|---|---|---|---|
| | RDA | Mean | SD | t value | RDA | Mean | SD | t value |
| Cereals | 475 | 394 | 39 02 | 2 0756 | 350 | 335 3 | 49 54 | 0 2968 |
| Pulses | 60 | 11 4 | 11 22 | 4 3320** | 55 | 14 3 | 13 05 | 3 1173* |
| Green leafy vegetables | 125 | 5 7 | 12 20 | 9 7767** | 124 | 10 | 13 98 | 8 2282** |
| Other vegetables | 75 | 32 1 | 25 01 | 1 7151 | 75 | 25 3 | 17.94 | 2 7696* |
| Roots and tubers | 100 | 111.3 | 61 33 | 0 1842 | 75 | 125.1 | 68 01 | 0 7366 |
| Milk and milk products | 100 | 88 8 | 50 35 | 0 2224 | 100 | 112.9 | 47.90 | 0 2693 |
| Fruits | 30 | 38 1 | 41.21 | 0 1965 | 30 | 25 1 | 27 97 | 0 1751 |
| Fats and oils | 30 | 6 9 | 4.12 | 5.6044** | 25 | 8.7 | 4 35 | 3 7493** |
| Sugar and jaggery | 30 | 25.4 | 4 48 | 1 0274 | 30 | 25.2 | 12.03 | 0 3988 |
| Animal foods (fish) | 30 | 111.3 | 34 26 | 2 3732* | 30 | 103 3 | 52 92 | 1 3852 |
| Nuts and oilseeds | 30 | 28 6 | 9 79 | 0 1430 | 30 | 27 2 | 13 41 | 0 2088 |

* Significant at 5% level
** Significant at 1% level

and oils were significantly lower than the quantity recommended for the particular age groups. While the quantity of food articles like animal foods mainly fish were significantly greater than the recommended quantity

Statistical interpretation of the comparison of the average intake of nutrients to the recommended level are presented in Table 43

Statistical treatment revealed that the nutrients like retinol and riboflavin were significantly lower in the diets of both the groups Energy and thiamine were significantly low in the diets of the male agricultural labourers while iron was significantly low in the diets of female agricultural labourers

Individual energy consumption pattern of the agricultural labourers are presented in Table 44

The above table revealed that, energy consumption of the 20 labourers (10 male agricultural labourers and 10 female agricultural labourers) were inadequate Deficit in calories were ranged from -15 0 per cent to -32 66 per cent in the case of male agricultural labourers while in tne case of female agricultural labourers it ranged from -1 52 to -27.69 per cent A significant association between Recommended Daily Allowance and energy consumption pattern were obtained in the case of male agricultural labourers ($r = 0\ 7582^{*}$) as well as in the case of female agricultural labourers ($r = 0\ 9746^{**}$)

Table 43 t value for RDA of nutrients and the average intake of nutrients

| Nutrients | Male agricultural labourers | | | | Female agricultural labourers | | | |
|---|---|---|---|---|---|---|---|---|
| | RDA | Mean | SD | t value | RDA | Mean | SD | t value |
| Protein (g) | 60 | 58.41 | 7 65 | 0.2077 | 50 | 52 676 | 13.2980 | 0 2012 |
| Fat (g) | 15 | 28.05 | 7 04 | 1.8543 | 15 | 28 343 | 12 7358 | 1 0484 |
| Energy (kcal) | 2700 | 2125.9 | 153 79 | 3.7331** | 2100 | 1894 8 | 199 83 | 1.0268 |
| Calcium (mg) | 400 | 411 44 | 144 68 | 0.7090 | 400 | 379 19 | 80.576 | 0.2581 |
| Iron (mg) | 28 | 23.031 | 2 798 | 1.7757 | 30 | 21.199 | 3.2834 | 2.6803* |
| Retinol (µg) | 600 | 126 94 | 118 68 | 3 9861** | 600 | 124.366 | 86.3185 | 5.5102** |
| Thiamine (mg) | 1.4 | 1.0429 | 0 1440 | 2.4797** | 1.1 | 0.9192 | 0.1519 | 1.1895 |
| Riboflavin (mg) | 1.6 | 0.6280 | 0.1164 | 8.3484** | 1.3 | 0.6549 | 0.2148 | 3 0029* |
| Niacin (mg) | 1 8 | 18.66 | 1 1904 | 0.5608 | 14 | 15.97 | 2.2659 | 0.8705 |
| Vitamin C (mg) | 40 | 56.191 | 28.707 | 0.5639 | 40 | 58.55 | 27 0747 | 0.6853 |

* Significant at 5% level
** Significant at 1% level

Table 44 Energy consumption pattern of the agricultural labourers

| Male agricultural labouers | | | | Female agricultural labourers | | | |
|---|---|---|---|---|---|---|---|
| Age (years) | Weight (kgs) | Energy consumed (Kcal) | Percentage difference from energy expended (Kcal) | Age (years) | Weight (kgs) | Energy consumed (Kcal) | Percentage difference from energy expended (Kcal) |
| 42 | 60 | 2246 | -16 81 | 46 | 42 | 1825 | 13 09 |
| 38 | 41 | 2250 | -16.66 | 45 | 34 | 2043 | -2.71 |
| 45 | 41 | 2193 | -18 77 | 40 | 44 | 1581 | -24.71 |
| 38 | 47 | 2113 | -21 74 | 39 | 45 | 1531 | -27.69 |
| 47 | 48 | 1961 | -27 37 | 50 | 46 | 2064 | -1 71 |
| 39 | 36 | 2072 | -23 25 | 42 | 44 | 1833 | -12 71 |
| 38 | 42 | 2295 | -15 00 | 38 | 38 | 2061 | -1 86 |
| 42 | 46 | 2048 | -24.14 | 38 | 45 | 2068 | -1 52 |
| 45 | 43 | 2263 | -16 18 | 43 | 42 | 1977 | -5 86 |
| 30 | 43 | 1818 | -32 66 | 34 | 40 | 1965 | -6 43 |

Recommended kilocalories for males 2700 Kcal
Recommended kilocalories for females 2100 Kcal

Correlation coefficient for males 0.7582*
Correlation coefficient for females 0.9746**

* Significant at 5% level
** Significant at 1% level

The energy consumed by food intake and the energy expended by prediction equation x Basal Metabolic Rate (BMR) factor based on age and weight were determined and statistically treated and the details are presented in Table 45

A significant correlation were found between the energy consumed and the energy expended only in the case of male agricultural labourers ($r = 0.8791^{**}$)

An assessment of the mean energy consumption and expenditure and its percentage difference revealed that there is a negative energy balance in both male and female agricultural labourers

The height and weight profile of the 20 labourers are presented in Table 46

The height profile of the labourers showed that, male agricultural labourers had height that ranged from 147 cms to 180 cms and female agricultural labourers had heights that ranged from 137 cms to 154 cms Average height of male agricultural labourers were 159 cms and female agricultural labourers were 147 cms

The weight profile of the 10 male agricultural labourers ranged from 36 to 60 kgs and of the 10 female agricultural labourers ranged from 34 to 46 kgs. 90.0 per cent of the male agricultural labourers and all the female agricultural labourers were found to be of under weight

Table 45 Effect of energy consumption on energy expenditure

| Sl. No. | Male agricultural labourers | | | Sl No | Female agricultural labourers | | |
|---|---|---|---|---|---|---|---|
| | Energy consumption (Kcal) | Energy expenditure (Kcal) | Percentage of deficiency (Kcal) | | Energy consumption (Kcal) | Energy / expenditure (Kcal) | Percentage of deficiency (Kcal) |
| 1 | 2246 | 2647 | -15 15 | 1 | 1825 | 2023 | -9 78 |
| 2 | 2250 | 2278 | -1 23 | 2 | 2043 | 1904 | -17 30 |
| 3 | 2193 | 2278 | -3 73 | 3 | 1581 | 2053 | -22.99 |
| 4 | 2113 | 2395 | -1 77 | 4 | 1531 | 2067 | -25.93 |
| 5 | 1961 | 2414 | -18 76 | 5 | 2064 | 2082 | -0.86 |
| 6 | 2072 | 2181 | -4 99 | 6 | 1833 | 2053 | -10.71 |
| 7 | 2295 | 2298 | -0 13 | 7 | 2061 | 1964 | -14.93 |
| 8 | 2048 | 2375 | 73 77 | 8 | 2068 | 2067 | +0.05 |
| 9 | 2263 | 2317 | -2 33 | 9 | 1977 | 2023 | -2.27 |
| 10 | 1818 | 2317 | -21 54 | 10 | 1965 | 1994 | -1.45 |

Correlation coefficient of energy expenditure and height for males r = 0 8791**

** Significant at 1% level

Fig 3 Energy consumption energy expenditure pattern of agricultural labourers

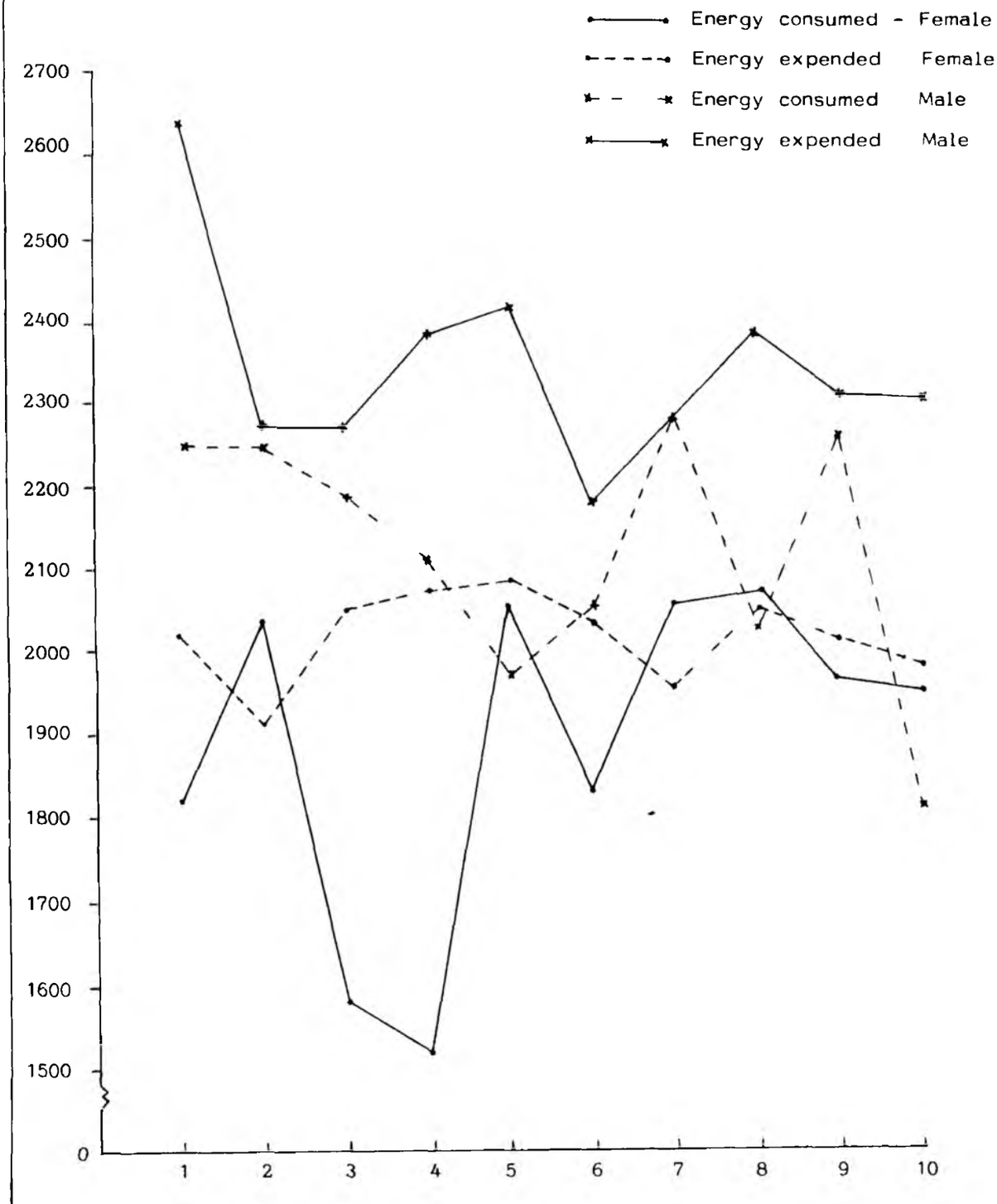


Table 46 Height and weight profile of agricultural labourers

| Male agricultural labourers | | Female agricultural labourers | |
|---|---|---|---|
| Height (cms) | Weight (kgs) | Height (cms) | Weight (kgs) |
| 180 | 60 | 145 | 42 |
| 155 | 41 | 147 | 34 |
| 147 | 41 | 142 | 44 |
| 169 | 47 | 154 | 45 |
| 164 | 48 | 137 | 46 |
| 153 | 36 | 144 | 44 |
| 159 | 42 | 147 | 38 |
| 156 | 46 | 150 | 45 |
| 152 | 43 | 150 | 42 |
| 156 | 43 | 154 | 40 |

Correlation coefficient of weight and height for male agricultural labourers $r = 0.8780^{**}$ **Significant at 1% level

Ideal body weight for Indian reference men - 60 kgs
Ideal body weight for Indian reference women - 50 kgs

BMI (Body Mass Index) of the labourers were computed from weight and height and the results are presented in Table 47.

The above table depicted that, 10.0 per cent male agricultural labourers and 10 0 per cent female agricultural labourers were in severe CED (Chronic Energy Deficiency) state, 20 0 per cent male agricultural labourers and 10.0 per cent of the female agricultural labourers were in moderate CED, 30.0 per cent males and 10 0 per cent females were in mild CED; 40.0 per cent males and 40.0 per cent females were in low weight normal and 30 0 per cent female agricultural labourers were normal BMI Female agricultural labourers were having a higher BMI than male agricultural labourers

Haemoglobin levels of the agricultural labourers were assessed and results presented in Table 48

As shown in Table 48 among the selected agricultural labourers surveyed, male agricultural labourers were found to have haemoglobin levels in between 12 1 to 14.5 gms while female agricultural labourers were found to have haemoglobin levels in between 9.5 to 14 0 gms. Female agricultural labourers were having a low level of haemoglobin when compared to male agricultural labourers

Nutritional status index of the agricultural labourers were worked out from age, weight, height, Body Mass Index (BMI) and

Table 47. Body Mass Index of the Agricultural labourers

| BMI class | Male respondent | | Female respondent | |
|---|---|---|---|---|
| | No | % | No | % |
| 16 | 1 | 10.0 | 1 | 10 0 |
| 16 0-17 0 | 2 | 20.0 | 1 | 10 0 |
| 17 0-18 5 | 3 | 30.0 | 1 | 10 0 |
| 18 5-20 0 | 4 | 40.0 | 4 | 40 0 |
| 20 0-25 0 | - | - | 3 | 30 0 |
| Total | 10 | 100 0 | 10 | 100 0 |

Correlation coefficient of height and weight for males = 0 8780*
(Significant at 5% level)

Correlation coefficient of nutrition status and BMI for males = 0 6526**
(Significant at 1% level)

Correlation coefficient of BMI and weight for females = 0 8174**
(Significant at 1% level)

Correlation coefficient of BMI and energy expenditure for females
= 0 8176**
(Significant at 1% level)

Fig 4 BMI (Body Mass Index) of agricultural labourers

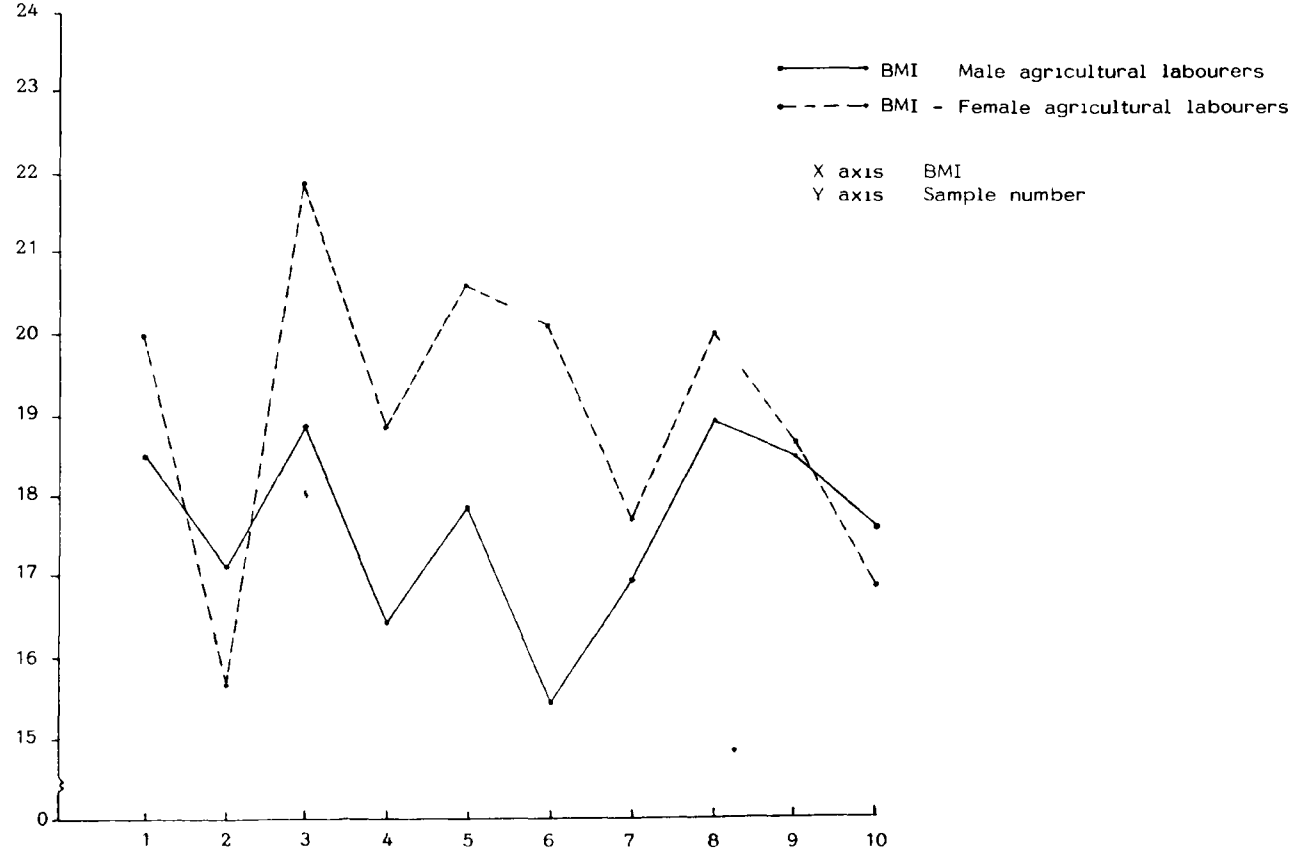


Table 48 Haemoglobin level of the agricultural labourers

| Haemoglobin range (gms) | Male agricultural labourers | | Female agricultural labourers | |
|---|---|---|---|---|
| | No | Percentage | No | Percentage |
| 9 5-10.0 | - | - | 1 | 10 0 |
| 10 1-10 5 | - | - | - | - |
| 10 6-11 0 | - | - | 2 | 20 0 |
| 11 1-11 5 | - | - | - | - |
| 11.6-12 0 | - | - | 2 | 20.0 |
| 12 1-12 5 | 2 | 20.0 | 3 | 30.0 |
| 12 6-13 0 | 3 | 30.0 | 3 | - |
| 13 1-13 5 | 2 | 20 0 | - | - |
| 13 6-14 0 | 1 | 10 0 | 2 | 20 0 |
| 14 1-14.5 | 2 | 20.0 | - | - |
| Total | 10 | 100 0 | 10 | 100 00 |

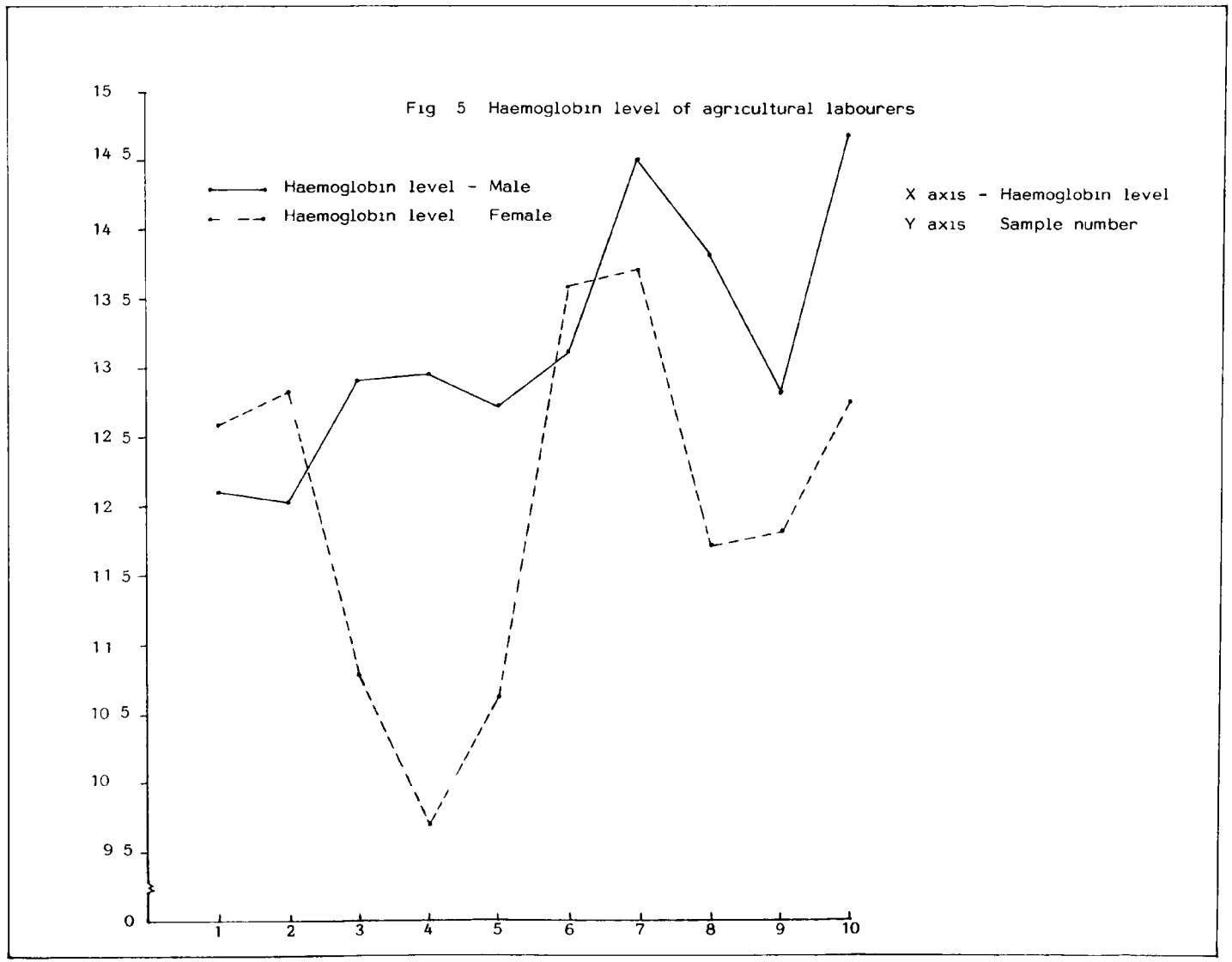


Fig 5 Haemoglobin level of agricultural labourers
Haemoglobin level - Male
Haemoglobin level Female
X axis - Haemoglobin level
Y axis Sample number
15
14 5
14
13 5
13
12 5
12
11 5
11
10 5
10
9 5
0
1
2
3
4
5
6
7
8
9
10

Table 49. Nutritional status index developed for agricultural labourers

| Male agricultural labourers | | | | | | Female agricultural labourers | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Age (years) | Weight (kgs) | Height (cms) | BMI | Haemoglo-bin (gms) | Nutritional status | Age (years) | Weight (kgs) | Height (cms) | BMI | Haemoglo-bin (gms) | Nutritional status |
| 42 | 60 | 180 | 18.51 | 12.12 | 37.14 | 46 | 42 | 145 | 20.0 | 12.58 | 22.15 |
| 38 | 41 | 155 | 17.08 | 12.05 | 34.94 | 45 | 34 | 147 | 15 74 | 12.87 | 21.04 |
| 45 | 41 | 147 | 18.98 | 12 94 | 37.88 | 40 | 44 | 142 | 21.89 | 10.87 | 21.17 |
| 38 | 47 | 169 | 16.49 | 13.05 | 36.22 | 39 | 45 | 154 | 18.98 | 9.7 | 20.45 |
| 47 | 48 | 164 | 17.89 | 12.76 | 37.24 | 50 | 46 | 137 | 24.59 | 10.6 | 21.77 |
| 39 | 36 | 153 | 15.38 | 13.12 | 35.01 | 42 | 44 | 144 | 21.25 | 13 52 | 22.93 |
| 38 | 42 | 159 | 16.66 | 14.5 | 38.14 | 32 | 38 | 147 | 17.59 | 13.68 | 21.70 |
| 42 | 46 | 156 | 18.93 | 13 78 | 39.14 | 38 | 45 | 150 | 20.0 | 11.73 | 21.74 |
| 45 | 43 | 152 | 18.61 | 12.72 | 37.40 | 43 | 42 | 150 | 18.66 | 11 82 | 21.52 |
| 30 | 43 | 156 | 17.69 | 14.65 | 38.77 | 34 | 40 | 154 | 16 87 | 12.81 | 21.53 |

Correlation coefficient 0.6369*
(Significant 5% level)

haemoglobin levels and the details are presented in Table 49 As revealed in the table, nutritional status index were worked out from the variables like age, weight, height, BMI and haemoglobin level Nutritional status of the male agricultural labourers were ranged from 34 94 to 39 14 Nutritional status of female agricultural labourers were ranged from 20 45 to 22 93 A significant association (r = 0 6369*) was observed in the nutritional status of male agricultural labourers.

Clinical findings

Clinical examination was carried out for the 20 agricultural labourers and the results are presented in Table 50.

Table 50, showed the prevalence of deficiency signs among labourers. Common deficiencies observed among the labourers re night blindness (65 0 per cent), photophobia (55 0 per cent), anaemia (55 0 per cent), enlargement of liver - soft (45.0 per cent) and firm (55 0 per cent), teeth carries (60 0 per cent), mottled enamel (85 0 per cent) and pigmentation at knuckles/fingers/toes (60.0 per cent). These deficiencies were more among female agricultural labourers than male agricultural labourers. Other deficiencies observed among the labourers were oedema (10 0 per cent), emaciation (5 0 per cent), gum-spongy bleeding (10 0 per cent), parotid enlargement (5 0 per cent), thyroid enlargement (20 0 per cent), Tongue papillae atrophie (20 0 per cent),

Table 50 Clinical deficiency disorders located among agricultural labourers

| Deficiencies | Male respondent | | Female respondent | | Total | |
|---|---|---|---|---|---|---|
| | No | % | No | % | No | % |
| Oedema | 1 | 10 0 | 1 | 10.0 | 2 | 10 0 |
| Night blindness | 4 | 40 0 | 9 | 90.0 | 13 | 65.0 |
| Photophobia | 2 | 20.0 | 9 | 90.0 | 11 | 55.0 |
| Anaemia | 3 | 30 0 | 8 | 80 0 | 11 | 55 0 |
| Emaciation | 1 | 10.0 | - | - | 1 | 5 0 |
| Gum spongy bleeding | 2 | 20 0 | - | - | 2 | 10.0 |
| Parotid enlargement | 1 | 10.0 | - | - | 1 | 5 0 |
| Thyroid enlargement | - | - | 4 | 40.0 | 4 | 20.0 |
| Enlargement of liver | | | | | | |
| Soft | 6 | 60.0 | 3 | 30.0 | 9 | 45 0 |
| Firm | 4 | 40.0 | 7 | 70.0 | 11 | 55.0 |
| Tongue papillae atrophie | 3 | 30 0 | 1 | 10.0 | 4 | 20 0 |
| Koilonyehia | 1 | 10.0 | 5 | 50.0 | 6 | 30.0 |
| Teeth carries | 4 | 40.0 | 8 | 80.0 | 12 | 60 0 |
| Mottled enamel | 8 | 80.0 | 9 | 90.0 | 17 | 85.0 |
| Frontae parietal boosing | 1 | 10 0 | 3 | 30 0 | 4 | 20 0 |
| Angular stomatites | - | - | 2 | 20 0 | 2 | 10 0 |
| Pigmentation at knuckles/ fingers/toes | 3 | 30 0 | 9 | 90 0 | 12 | 60 0 |
| Phynoderma | 1 | 10 0 | 4 | 40.0 | 5 | 25 0 |

koilonyehia (30 0 per cent), frontal parotal boosing (20 0 per cent), angular stomatitis (10.0 per cent) and phrynoderma (25 0 per cent)

# Discussion

## DISCUSSION

The present study was carried out to assess the food consumption and energy expenditure pattern of 150 agricultural labourers of Trivandrum District. The survey sample comprised of 75 female and 75 male labourers. The assessment was made through surveys on the socio-economic and food consumption pattern of the families, personal characteristics of the labourers, with reference to their dietary pattern, daily energy expenditure pattern, specific job problems and occupational hazards.

Majority of the labourers surveyed were from the under previleged communities. Nuclear type families with patriarchal system were found to be popular, among these communities. Majority of the families had less than 20 cents of lands in their possession and these findings are in line with an earlier study conducted by Devadas and Easwaran (1986) among agricultural labourers in Tamil Nadu Family size is a major factor influencing the nutritional status of the family members (Varghese, 1989, Nagammal, 1989 and Thomas, 1989) In a study conducted by Nagammal (1989), it was reported that farm families in Trivandrum District in general were medium sized with 5 to 6 members. Studies conducted among rural households of Tamil Nadu by Devadas et al. (1975) has also indicated similar results In the present study also, many of the families surveyed were also comparatively of medium size with 3 to 5 members and

with more female members. These findings support the salient observations of 1981 census also.

More than half of the families s urveyed were found to have two members viz the respondents and their spouses employed outside the home The wage rates of agriculiural labourer in Kerala are comparatively higher than in other states and the families surveyed were also found to have a comfortable monthly income ranging between Rs 501/- to 2000/- However in this context the family size was found to function as a negative factor nullifying the advantages of the income The monthly income of each family was also found to be directly proportional to the number of family members employed However this factor was significantly influencing the families of male agricultural labourers A comparison between the two categories of families also gave statistically significant results.

Monthly income of a family is the deciding factor, determining its major expenditure pattern. The expenditure per month for various items incurred by the families indicated that, their major expenditure was on food. The economic status of the families and women's employment outside the home were found to influence significantly their food purchasing pattern. According to Devadas and Easwaran (1986) the rural households in Tamil Nadu spent over 90.0 per cent of their income on food without including

fuel According to Ramadas Murthy et al. (1983) nearly 84.0 per cent of the family income was spent on food by rural households in Hyderabad. Findings of the present study had indicated similar trends of a study conducted by Quiogue (1970), who had found that lower the income, higher was the percentage of income spent on food

Rao (1971) reported a striking inverse relationship between family size and food expenditure pattern. As the family size and the number of persons employed in a family increases, the amount spent for food was observed to increase. Monthly expenditure on non food items were comparatively less except the amount spent for personal and education expenditure. The amount spent for personal expenditure was mainly for the purchase of alcohol, cigarettes, tobacco, betel nut and coffee.

Cereals especially rice was the major staple food of the families surveyed Variation in the expenditure incurred for purchasing this major staple food article gave statistically significant correlation when compared between the two categories of the families and within each group. Roots and tubers were found to be the second staple food of the families surveyed Variation in expenditure for purchasing this food article also gave statistically significant correlation when compared between the two categories of the families and within each group

In the case of the families of male agricultural labourers, amount spent for the purchase of roots and tubers and dry food articles were found to be significantly and positively associated with the amount spent for cereals In the case of the families of female agricultural labourers, amount spent for the purchase of protective foods like pulses, vegetables and fish were found to be significantly and positively associated with the amount spent for cereals. In a way this indicates a better consumption pattern and variety in the diets of the families of female agricultural labourers A comparison of the amount spent for pulses with other food articles revealed that families of female agricultural labourers who were spending more for pulses tempted to spend more for green leaves, vegetables and meat indicating a possibility of a better balanced diet than the other group.

Comparatively negligible amount was found to spend for the purchase of perishable food articles in all the families. According to Alan Berg (1973), the allocation for cereals declines and that for milk products increases as families move in to the middle income levels Also higher the income, larger percentage of the income was spent on fruits, vegetables and other variety food items. Among these families, vegetables, milk, fish and cooking oils were frequently purchased by all the families but the quantity was very negligible However statistically significant results were obtained for the purchase of these food articles.

**Food consumption pattern of the families**

Food consumption pattern of the families surveyed indicated that, all the families were habitually nonvegetarians. An analysis of frequency of use of various food items indicated that the general trend was to use comparatively cheap food articles like cereals, roots and tubers and fish Fats and oils and sugar were also the essential items in the daily diet, resulting in a monotonous meal with less variety probably because of their economic situation and ignorance about the nutritional significance of other foods. Earlier studies conducted by Devadas and Easwaran (1986) had reported that, food available to a household is dependent on the purchasing power and food available in the region Earlier studies conducted among rural families in Trivandrum had also revealed similar trend (Thomas, 1989)

Being agricultural labourers, the families (approximately 50.0 per cent) were interested in home production of food articles like milk, egg, coconut, roots and tubers (tapioca), vegetables and fruits (banana) This had helped to improve the food consumption pattern to an extent

An interesting observation made in this context was that the quantity of food articles produced did not influence the consumption pattern Same trend was noted when food articles like vegetables, milk, egg, roots and tubers (tapioca), fruits (banana) and coconut were produced at the household level These observations

indicated that introduction of any activity as a home based occupation to increase food production may help to improve the economic situation and not the nutritional situation of the family members

Culinary practices followed by the families were far from satisfactory Earlier studies had indicated that, washing dry food articles like rice, several times before cooking will result in leaching of water soluble nutrients Similarly nutrient loss will occur from vegetables if they are cut before washing or if they are cut into small pieces These families were also following these unnscientific practices. Very few families were found to have applied suitable practices like germinating pulses before use or soaking pulses before cooking, so as to save fuel and to enhance the quality

An assessment of common cooking methods employed by the home makers had revealed, lack of variety in the daily menu Inclusion of food articles like fats and oils were mainly meant to improve the acceptability of the preparation by these practices were very rarely adopted due to the economic condition of the families. The advantages of adopting various cooking methods in a daily menu will help to avoid monotony as well as to introduce variety. However such variations can be influenced by various socio-economic situation in which the household is placed. Major observations made in this respect were also not encouraging. Findings of

the earlier studies conducted among households in similar situations were observed to be same (Thomas, 1989) Storage practices observed by the families were also far from satisfactory

Family meal pattern generally vary with customs, with food requirement, with the type of meal available and the economic status of the families. An ideal meal pattern is that the foods chosen, supply all the nutrients needed for the day by the family members.

Daily meal pattern obtained through a recall method from 150 families indicafed that, three major meal pattern consisting of breakfast, lunch and dinner and one snack in the evening was the practice in all the families Three-meal-a-day system (in the morning, afternoon and night) among rural households in Trivandrum were observed by George (1987) and Jayasree (1987) Breakfast is expected to be a meal supplying 1/3rd of the days nutrients including calories Major ingredients in the breakfast meal are to be cereal, pulse, fruit along with this milk and sugar However the breakfast of the families were found to contain only a cereal preparation along with a beverage like tea or coffee Pulse and fruit were included in the breakfast by very few families Thus their breakfast was found to be highly insufficient with quantity as well as quality of food items included

Hui (1983) had reported that food served at lunch should help balance the nutrient intake for the body Ideal lunch and dinner are expected to contain cereal and pulse preparation, vegetables, milk and milk products, egg and fruits In the present study, the inclusion of milk or milk product, fruit and egg were found to be deficient in the lunch and dinner Besides cereal, roots and tubers were also found to be included as energy sources in lunch and dinner, in some families surveyed Fish being available in plenty included as an integral item in the lunch and dinner Combination of cereal and fish in these meals might have been responsible for the effective utilisation of nutrients available in the meagre meals. Earlier studies indicated that excess consumption of fish and tapioca is common in the dietry pattern of the Keralites (Gopalan, 1979)

A major crop grown in abundance in Kerala is green leafy vegetables, which are to be inexpensive source of many nutrients essential for growth and maintenance of normal health (ICMR, 1987) The deficiency of vitamin A, vitamin $B_1$, vitamin $B_2$ and vitamin C is reported to be uprooted by the inclusion of green leafy vegetables in the daily diet (Sadasivan et al , 1980) However this food article was found to be still deleted by the farm families probably because of their ignorance.

Snacks are generally expected to introduce variety, with regard to taste and appearance to break the monotony and also as a nutrient supplement in the meal pattern Snacks between the meals are also reported to increase the persons work efficiency throughout the day. However the evening snack of the families comprised either tea or, a tea with cereal or a tuber. The cereal item included as snacks were mainly the leftover of breakfast items, and these food items are incapable of meeting their requirements.

In a life cycle, there are different stages when adequate nutritional care is to be given to the individual. These stages are identified as infancy preschool period, school going age, adolescene, pregnancy, lactation and sick periods. Human milk is universally regarded as an ideal food for feeding infants during the early months, but beyond three to four months, breast milk alone is not able to supply the needs of the infant Supplementary foods are needed after three months An interesting observation made in this context was whenever, the mother was not able to feed the infant, cow's milk or cow's milk with ragi or biscuit were found to be introduced. Similar practices were also observed and reported by George (1987)

Probably because of the constant exposure to the need of scientific infant feeding practices through popular media majority of the women were aware of the importance of breast feeding

Preschool period are considered as a vulnerable period Since the rate of growth and development are taking place at a faster rate during this period This growth and development are influenced by the diet consumed In the present study, preschool children's diet were found to be inadequate with respect to the quantity and quality of nutrients present. The findings are similar to the earlier studies conducted by (Thomas, 1989)

Majority of the school children and adolescents were observed to consume inadequate diets and are malnourished Bhat and Dahiya (1985) had indicated that majority of the Indian children received only ordinary home diets and those diets were deficit in many nutrients like vitamin A and C and iron. In the present study also, the diets given to the children during school period and adolescent period were found to be almost similar to that of adult diet

Pregnancy and lactation are normal physiological process, and during these periods, the nutritional requirement of the mother increases considerably Moreover during pregnancy too much of nutrient loss occurs due to vomitting. A constant accumulation of nutrients take place during pregnancy period and so foods rich in calcium, protein, and iron are required in larger quantities But the food intake of pregnant mothers in our country is reported to be deficient in terms of energy and other nutrients as reported

by Devadas and Easwaran (1986). A constant drainage of nutrients occur during lactating period when all the nutrients in larger quantities are required In the present study, during pregnancy period, there is very little consumption of fruits, milk and egg During lactation period, same adult diet was consumed without modification of any nutrients. Easwaran and Goswami (1989) reported that, special conditions like pregnancy and lactation did not receive any special attention except for the increased intake of the normal adult women's diet

During special occasions like birthdays, marriages and festivals, special items are included along with normal diet.

Modificiation of diet is necessary when affected by different diseases. Easwaran and Goswami (1989) opined that, bland diets were given during fever, diarrhoea and chickenpox In the present study, special dietary care was given only during extreme conditions During diseases like cough, fever, diarrhoea, cholera, smallpox, chickenpox etc most of them prefer rice gruels and bread

Devadas and Easwaran (1986) had reported that the female head of the family cooked and distributed the food, giving priority to the male adult and preschool children. In the present study also, in almost all the families preference was given to the head of the family while serving the food. In few cases, preference was given to small male children

**Personal characteristics of the labourers**

Labourers selected for the study were in a minimum tenure of 5 years since the major aim of the study was to ascertain their nutritional status in relation to their work pattern In a similar study conducted by Masiukiewiez (1983), the respondents selected were in the age group of 26 to 50 years In this study, the respondents studied were in the age ranging 20 to 65 years

Compared to other segments of the population, the educational level of the agricultural labourers were far from satisfactory, this is mainly because they gave more importance to job than for education or in other words if parents were employed as labourers, children were also taken to the same occupation. Probably because of this reason, 47.33 per cent of the respondents were found to be illiterate. In Kerala, the average literacy rate for males is 75.3 per cent and for females it is 65 7 per cent (1980) A comparison of the education level of male and female labourers revealed that female labourers were more illiterate (60.0 per cent) than males (34 66 per cent). Paniker (1979), conducted a study among Kuttanad agricultural labourers and found that the literacy rate in Kuttanad worked out to be 72.0 per cent in 1971, which is higher than the average for Kerala. Gopalan (1987) reported that, education is an important factor influencing economic status of women. In India, the literacy rate for females is only 24.82 per cent UNICEF (1985)

has reported that rate of literacy among rural women is only 13.2 per cent as against 42.31 per cent in urban sector. In the adjacent state Tamil Nadu also, literacy rate is very low among the rural males and females in the three income groups (high, middle and low) as observed by Easwaran and Goswami (1989). The average literacy rate in Tamil Nadu for males is 58.2 per cent and for females it is 35.0 per cent (1980).

Average age of settling in marriage for the male agricultural labourers was 24 and for female agricultural labourers it was 18 years. It has been reported that in Tamil Nadu, 81.2 per cent males were married between the age group of 20 to 24 years and 26.8 per cent females were married between the age group of 15 to 19 years (1980).

In Kerala, living condition of a family reflects the economic and health conditions of the family members (Nagammal, 1989). In the present study, the agricultural labourers were found to be health conscious. Incidences of miscarriages/abortions among women were also comparatively less.

The health status of the children as observed by majority of the parents were reported to be unsatisfactory. And health determinants, as identified by the parents, were frequent occurrence of diarrhoea, fever, pneumonia, spots with pus, heart trouble, polio and insufficient nutrient food respectively. Many of the

children (70.67 per cent) were also found to be immunized at prescribed period. Findings of a study conducted by Nagammal (1989) had also reported similar results. Survey conducted earlier by Sahu et al. (1985) has also reported on the same line. The situation of child health care practices in Kerala is entirely different from other parts of the country only 39.0 per cent of the children below five years were vaccinated.

Morbidity status of the children during the survey period were comparatively high in the families surveyed. This may probably due to lack of sanitation in the premises.

Keralites are reported to be very conscious about their health status and the facilities available for maintaining the same. In this study also majority of the respondents were very conscious about their own health condition. Preference was also found to be for allopathic treatment. Probably because of the better awareness and more facilities extended even to the remote areas under the Public Health Service System in the State.

Many of the respondents selected for the study were labourers selecting employment within 2 kms of their residence for 24 days in a month. 15 minutes to 30 minutes were taken to reach the work spot by majority of the labourers. Only very few labourers (21.0 per cent) were having an added drudgery of walking long distances

to reach their work spot. Public conveyance and cycle were the mode of transport used to reduce the drudgery by these labourers.

The total working hours per day was about 9 hours. Generally 1 hour lunch interval was taken. In a study conducted by Pandey et al. (1988), rural women were observed to work from 9 to 14 hours in a day including the domestic chores. The work of agricultural labourers were considered as seasonal. Many of the labourers were getting work for 24 days within a month, probably because the survey was conducted during harvest season. Women were getting less number of working days than men. Paniker (1979) had found that, on an average, a male agricultural worker in Kuttanad gets about 100 to 120 days of work in a year. According to him, for a major part of the year, the agricultural worker remained practically unemployed.

90.0 per cent of the labourers had been working for more than 17 years. Since the study was to ascertain the nutritional status of labourers involved in agricultural activities, labourers with more experience in the field were selected purposely for the study. Compared to female agricultural labourers, male agricultural labourers were in the habit of spending leisure time in entertainments or visiting friends.

Findings of the study revealed that many of the male agricultural labourers (30.66 per cent) were not involving

themselves in household activities. However work related to animal husbandry/agriculture were mainly dealt by male agricultural labourers. Very few male agricultural labourers were in the habit of assisting women in food preparation, child care and collection of water and fuel.

Survey also revealed that in 46.67 per cent females, the labourers managed their household work by themselves. Elder female child was mainly responsible for helping the parents. Soni et al. (1986) reported that, husbands in dual career families assumed an important supportive role. It was seen that working wives received considerably more help from their husbands. Ogale (1977) showed that, the distributors of household tasks was not influenced by the type of family, size of family and employment status of the family members but was dependent on the socio-economic status of the families.

Since agricultural activities are seasonal, the labourers are expected to take up subsidiary occupation during the lean period. In the present survey, during the survey period, majority of the labourers were not taking up any type of subsidiary occupations. Occupations were taken up by very few labourers who were not getting employment frequently are milking animals in other families, running small hotels and functioning as watchers, salesman or as domestic servant. On an average 4 hours in a day were spent by those labourers for attending to these responsibilities.

A major defect found among the people of the low income strata are that when they become economically independent, a major shade of income is spend for certain unhealthy habits. In this study also, only very few female agricultural labourers in general were found to be in the habit of betel chewing or smoking or tobacco chewing. Ramadasmurthy et al. (1983) had reported similar results among industrial workers. David (1977) found that, consumption of alcoholic beverages by the workers had resulted in deficiencies of essential food factors like protein, vitamin and trace minerals and led to the occurrence of malnutrition. He further pointed out that, heavy alcohol consumption reduced both directly and indirectly the capacity of the intestine to absorb various nutrients such as the vitamin $B_1$ and $B_{12}$ and some essential amino acids and then aggrevating the malnutrition state. However, in the present study, it was observed that these habits were responsible for excess money expenditure. Eventhough a large amount of income was spent for such additions, expenditure on purchase of food from outside was very negligible.

During working days, majority of the labourers carried their meals from home except snack. Taking home meal for breakfast and lunch helped to reduce the expenditure on food. Only very few labourers were taking food outside for breakfast, lunch and for evening snack.

Survey also revealed that, majority of the labourers did not go to their work either due to guest at home or due to health problem or any personal affairs. Difficulties confronted by the male agricultural labourers due to their outside work are of the view that, lack of health due to improper rest. Too much of household work was the main problem confronted by the female agricultural labourers. Jhurani (1985) reported the same. Rajagopal and Das (1974) reported that, poor management of the home was a severe problem expressed by the employed home makers. Outside work had negatively influenced by 38.66 per cent labourers. Female labourers were more of this view than male labourers. Women played a major role in agricultural activities and they are the main supporter of male labourers (Devadas, 1975 and Deepali, 1979). From the present study, it was revealed that majority of the female agricultural labourers had taking up this outside work without much problems at the domestic front. Probably because of the co-operation of the family members.

93.33 per cent of women were able to worked upto 9 months during pregnancy period. During lactating period, 97.33 per cent of the female agricultural labourers were worked and took only 3 months rest after delivery.

Women employed outside the home were expected to play a dual role as a wage earner and housewife. Earlier survey, had indicated that, certain households responsibilities and personal

responsibilities are neglected by much women. Child care was one of the responsibility thus neglected and this led to the development of a negative attitude among children about the prolonged absence of mothers from home. In the present study, from the respondent's view, children had a positive response towards their mothers employment outside home. Whenever the women were having a young child, he was left at home and was not breast fed in between the working hours. This indicated that the children were generally breast fed only for 3 months. This practice is highly unscientific and responsible for the development of many nutritional disorders among young children at a later period. Major findings of a survey conducted by Suseela et al. (1970) had revealed that working mothers could not participate fully in child rearing activities due to the full time nature of the job and lack of other facilities at the work place. However, probably because of the involvement of other family members, the experience of the women in the present study were different. The young children who had not attained school going age, were left in the case of elder siblings (97.33 per cent) who would not be able to replace mothers so from this early months infants were introduced to liquid part of adult food or very dilute milk preparations. The type of mother surrogate taking care of the child in the absence of the mothers was an important factor influencing the nutritional status of children as reported by Choudhary et al. (1986).

**Food intake, energy expenditure and nutritional status of the agricultural labourers**

The actual food intake of the agricultural labourers estimated by the food weighment method revealed that, the inclusion of various food groups were not in a balanced proportion in their daily diet. Panicker (1979) conducted a study among Kuttanad agricultural labourers and found that the diets were both inadequate and unbalanced. He had also reported that, the intake of fish and meat together were sufficiently higher than the intake recommended by the ICMR for an adult man doing heavy work. Findings of the present study are in line with these observations. Their diets were found to be composed of energy rich foods. Family food consumption pattern of the female labourers were better with reference to variety of food articles.

The quantity of pulses, green leafy vegetables, fats and oils in the diet were significantly inadequate while fish were significantly higher than the quantity recommended for a balanced diet. Compared to RDA, the average intake of energy, retinol, thiamine and riboflavin were significantly inadequate in the diets of male agricultural labourers while in the diets of female agricultural labourers only iron, retinol and riboflavin were significantly inadequate. A report from Centre for Development Studies (1975) had revealed that the calorie norm for Kerala, taking into account the age size composition of the State's population, turns out to

be 2200 Kcal a day. Wong et al. (1985) found a direct relation between the amount of family income and expenditure on food. In this study also the consumption pattern of female labourers were found to be better, in relation to certain major food articles like cereals, pulses, green leafy vegetables, roots and tubers probably because of higher income of the family. Consumption of nutrients such as fat, niacin and vitamin C was in excess of the recommended levels. In the case of male labourers calcium was also found in sufficient quantities. But the diets were found to be deficient in vitamin A. Consumption of energy in male (78.73 per cent) and female (94.53 per cent) labourers were also almost meeting the requirement. Aujla et al. (1983) reported that, calories were consumed below the body requirements in low income, large family size and labour class categories in Punjab. Families with 3 or less number of children were observed to have better intake of calories and protein than the families with 4 or more children as reported by Kumar et al. (1976).

The availability of protein in both the groups near the recommended allowances. The intake of protein were much higher than the recommended allowances in all the income, occupation and family size groups and the consumption ranged between 129 to 169 per cent of recommended level as reported by Aujla et al. (1983). They also reported that the intake of iron, calcium and phosphorus were above the recommended allowances. In this survey, he found

that vitamin C and niacin were below the recommended allowances in all the income, occupation and family size categories. A report from Sundararaj and Sheela (1970), revealed that the adult intake was adequate in calories, vitamin A and riboflavin and marginally deficit in protein. They also opined that the diets were adequate in thiamine, niacin and ascorbic acid. In the present study, compared to male agricultural labourers, the consumption of nutrients in general were better in the case of female agricultural labourers.

Energy expenditure of Agricultural labourers

Average energy consumed by the labourers was compared with Recommended Daily Allowances (Males 2700 Kcal and Females 2100 Kcals). In the present study compared to RDA, the consumption of energy in both the groups were not satisfactory. Planning Commission has defined a poverty line on the basis of recommended nutritional requirements of 2400 calories per person per day for rural areas and 2100 calories per person per day for urban areas.

Shelty (1990) had conducted indepth studies on energy metabolism. According to his findings, when energy intake is reduced, changes in body composition and energy expenditure occur in order to attain a new, but lower level of energy balance.

Energy expenditure of a subject is derived from prediction equation x BMR factor (ICMR, 1989). Prediction equation of a subject

is based on sex, age, and weight and BMR factor depends on activity. A number of variables like age, sex, body weight and occupation were reported and it affect the energy expenditure (Panicker, 1979). In the present study a comparison on these lines revealed that the energy expenditure of the agricultural labourers were significantly greater than the energy consumed.

The mean energy consumed and expended gave negative difference in the case of both the groups of agricultural labourers. Percentage deficiency of kilocalories were obtained when compared with energy expended and energy consumed in both the groups. Ramana Murthy and Balavady (1966) had reported that, the energy expenditure for agricultural labourers were about 3000 Kcals. They also opined that, the variation in the energy expended by the same individual for the same activity on different days was less than the variation between individuals for the same activity.

Nutritional status index for agricultural labourers

The anthropometric measures with regard to height and weight helped to determine the nutritional status. In the present study, a significant correlation were found between the height and weight (0.8780**) profile of male agricultural labourers.

Body Mass Index (BMI) of the labourers were worked out from weight and height (BMI = weight/height$^2$). The BMI values

between 18.5 and 25.0 are considered to be compatible with health for both men and women (James et al., 1989). BMI values between 25.0 - 30.0 and above 30.0 are classified as obese grade I and II respectively (Garrow, 1987). They had also reported that, BMI class below 16.0 are considered as CED (Chronic Energy Deficiency) Grade III (severe), 16.0 to 17.0 are considered as CED Grade II (moderate). 17.0 to 18.5 are considered as CED Grade I (mild) and 18.5 to 20.0 are considered as normal. But in the present study only 30.0 per cent of the female agricultural labourers were found to have a normal BMI, 40.0 per cent each of male and female labourers were with low weight normal BMI. Shelty (1990) had reported that, a change in body size (stature and body weight) and in spontaneous physical activity by behavioural a life style responses are the pivotal changes that occur during an adaptation to long term or Chronic Energy Deficiency (CED). In the present study, a highly significant correlation were obtained between weight and height ($r = 0.8780^{**}$) and between nutritional status and BMI ($r = 0.6526^{*}$) for male agricultural labourers. Highly significant correlation were obtained between BMI and weight ($r = 0.8174^{**}$) and between BMI and energy expenditure ($r = 0.8176^{**}$) for female respondents.

Compared to females, the haemoglobin level were high among male labourers. Probably because of the higher iron requirement of women. Similarly the nutritional status index developed for male agricultural labourers indicated that a significant association.

Clinical examination was the most effective measure to find out the nutritional deficiencies among individuals. Park and Park (1981) reported that, the clinical examination was the most essential part of all nutritional surveys and it was also the simplest, the most practical and the soundest means of ascertaining the nutritional status of a group of individuals. The clinical assessment revealed that many nutritional disorders due to the deficiency of minerals and vitamins are prevalent among these agricultural labourers.

# Summary

## SUMMARY

The present study to assess the food consumption and energy expenditure pattern of agricultural labourers of Trivandrum District, threw light on the socio-economic and food consumption profile of the 150 families of agricultural labourers. The actual food intake and energy expenditure for various activities were determined in 20 labourers (10 male and 10 female agricultural labourers).

Results of the survey showed that, majority of the families were nuclear type following patriarchal system, and belonged to under previleged communities. Family size ranged from 3 to 5, with more female members.

Families with two persons employed were with a monthly income of Rs.1001/- and above and their major expenditure was for food. The food expenditure was found to be inversely proportional to the income. But personal and educational expenditure were directly proportional to the income. The families in general were conscious about savings, illeffects of debts and the need of repaying loans.

Rice was the major staple food followed by pulses and tubers. Only negligible amount was spent for the purchase of perishable food articles like vegetables, green leaves, fruits, egg, meat, fats and oils and ready to eat foods. However food articles

like vegetables, milk, fish and cooking oils though in less amounts were frequently purchased by all the families surveyed. All the families surveyed were habitual nonvegetarians.

Home production of food articles helped to improve the consumption and reduce the frequency of purchasing. However the quantity included in the family diet was not in proportion to the quantity produced at the household level. And culinary practices related to cooking and storage of food articles followed by majority of the families were unscientific.

A monotonus and unbalanced three meals a day pattern, composed of cereals, roots and tubers and fish was observed among the families surveyed. Locally available nutritious foods like green leafy vegetables were absent in their diets.

Diet given during special conditions revealed that, only during infancy and preschool period adequate care was taken, while during school going and adolescent periods only adults diet was given. Similarly during pregnancy and lactation, no additional care was taken for required food consumption. Easily digestible and dilute foods like rice gruels were mainly given when sick. Without considering the nutritional requirement of other family members, preference was given for the head of the family while serving food.

Among agricultural labourers studied, higher percentage of female labourers were illiterate. Average age of marriage for

male agricultural labourers was 24 and 18 in the case of female agricultural labourers. These labourers in general were conscious about the health condition of their children and the health facilities in the allopathic treatment, at present extended by the Government.

Majority of the labourers resided within 3 km from the work place and got employment for 24 days in a month. Female agricultural labourers were in the habit of working outside home even during pregnancy and lactation periods. Unlike male agricultural labourers, female agricultural labourers were not in the habit of spending time in leisure time activities. Instead household activities were undertaken by these women with the help of their female children. Too much of household work was found to be a major factor factor negatively influencing the health conditions of female agricultural labourers. Unhealthy habits such as smoking, betel chewing, alcoholism and using snuff powder were observed more among male agricultural labourers.

Inadequate and unbalanced consumption of food articles were observed among the two groups surveyed. Compared to female agricultural labourers, consumption pattern of male agricultural labourers, were better. Consumption of fish were significantly higher than their requirements. Availability of energy, retinol, thiamine and riboflavin were significantly inadequate in the diets of male

agricultural labourers. While iron, retinol and riboflavin were the nutrients inadequate in the diets of female agricultural labourers.

Energy consumption in both the groups were not satisfactory. Expenditure of energy were also more than the energy consumed.

40.0 per cent of the labourers in both the group were with low weight normal BMI (Body Mass Index). A highly significant correlation were obtained between weight and height, nutritional status and Body Mass Index (BMI) for males. While for female respondents, significant result was obtained for BMI and weight and BMI and energy expenditure.

Compared to female agricultural labourers, the haemoglobin level was better for male labourers. A Nutritional Status Index (NSI) revealed a significant association among age, weight, height, Body Mass Index (BMI) and haemoglobin in the case of male agricultural labourers.

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* Original not seen

# Appendices

## APPENDIX I

KERALA AGRICULTURAL UNIVERSITY

COLLEGE OF AGRICULTURE

DEPARTMENT OF HOME SCIENCE, VELLAYANI

SERIAL NO. NAME OF THE INVESTIGATOR: LAISAMMA CHERIAN

Food Consumption and Energy Expenditure Pattern of Agricultural Labourers of Trivandrum District

1. Name of the respondent
2. Name of the head of the family
3. Full address with home number
4. Religion
5. Caste
6. Type of the family
7. Family system
8. Details of head of the family
9. Details of land size of the labourers

Family size

10. Number of male adults above 18 in the family (Original No.
11. Number of female adults above 18 in the family (Original No.)
12. Number of male children in between 16-18 years (Original No.)
13. Number of female children in between 16-18 years (Original No.)

14. Number of male children in between 13-15 years (Original No.)

15. Number of female children in between 13-15 years (Original No.)

16. Number of male children in between 10-12 years (Original No.)

17. Number of female childred in between 10-12 years (Original No.)

18. Number of male children in between 7-9 years (Original No.)

19. Number of female children in between 7-9 years (Original No.)

20. Number of male children in between 4-6 days (Original No.)

21. Number of female children in between 4-6 years (Original No.)

22. Number of male children in between 1-3 years (Original No.)

23. Number of female children in between 1-3 years (Original No.)

24. Number of male infants in between 6-12 months (Original No.)

25. Number of female infants in between 6-12 months (Original No.)

26. Number of male infants in between 0-6 months (Original No.)

27. Number of female infants in between 0-6 months (Original No.)

28. Employment status of the family members

29. Details of family members who are employed in the family

30. Income from regular employment (Original No.)

31. Income from land, domestic animals, farm produce and business (Original No.)

32. Income from other sources (Original No.)

33. Income from subsidiary occupation (Original No.)

34. Total income of the family/month in range

35. Total family income/month (Original No.)

Monthly family expenditure pattern (in percentage)

36. Food

37. Clothing

38. Shelter

39. Personal expenditure

40. Transportation

41. Educational expenditure for children

42. Recreation

43. Repairing and maintenance of equipment

44. Water

45. Fuel

46. Electricity

47. Ceremonies/Festivals

48. Gift

49. Food outside home

50. Convenient food items (bakery items)

51. Maintenance of house

52. Savings

53. Repaying loans

54. Debt

55. Dietary pattern of the family

56. Dietary pattern of the respondent

Monthly expenditure for different food items/month (Original No.)

57. Expenditure for cereals

58. Expenditure for pulses

59. Expenditure for green leaves

60. Expenditure for vegetbles

61. Expenditure for roots and tubers

62. Expenditure for milk and milk products

63. Expenditure for fruits

64. Expenditure for egg

65. Expenditure for fish

66. Expenditure for meat

67. Expenditure for nuts and oil seeds

68. Expenditure for fats and oils

69. Expenditure for sugar and jaggery

70. Expenditure for spices and condiments

71. Expenditure for bakery items

72. Total food materials produced at home

Details of food articles produced at home/annum

73. Cereals (Rice)/annum

74. Vegetables/annum

75. Milk and milk products/day

76. Egg/month

77. Roots and tubers/annum

78. Fruits/annum

79. Nuts and oil seeds/annum

Frequency of using different food materials

80. Cereals

81. Vegetables

82. Milk and milk products

83. Pulses

84. Roots and tubers

85. Fruits

86. Animal foods

87. Fats and oils

88. Sugar and jaggery

Preparation of food articles before cooking

89. Cereals

90. Vegetables

91. Animal foods

92. Pulses

93. Roots and tubers

Different cooking methods applied on food articles

94. Cereals

95. Vegetables

96. Milk and milk products

97. Pulses

98. Roots and tubers

99. Fruits

100. Animal foods

Storage of food articles

101. Cereals

102. Vegetables

103. Milk and milk products

104. Pulses

105. Roots and tubers

106. Fruits

107. Animal feeds (fish)

108. Nuts and oil seeds (coconut)

Daily meal pattern followed in the family

109. Break fast

110. Lunch

111. Evening tea

112. Dinner

113. Special foods given during infancy

Preschool period

114. Break fast

115. Lunch

116. Evening tea

117. Dinner

School period

118. Breakfast

119. Lunch

120. Evening tea

121. Dinner

Adolescent period

122. Breakfast

123. Lunch

124. Evening tea

125. Dinner

Pregnancy

126. Breakfast

127. Lunch

128. Evening tea

129. Dinner

Lactating period

130. Breakfast

131. Lunch

132. Evening tea

133. Dinner

Diet for celebrations

134. Birthday's

135. Marriage

136. Festivals

Diet during illness

137. Cough

138. Fever

139. Diarrhoea

140. Cholera

141. Smallpox

142. Chickenpox

143. Preference in serving food in the family

Details regarding the women in the family

144. Age of the respondent

145. Educational status of the respondent

146. Age at which married

147. Number of pregnancies

148. Normal or cesarian delivery

149. Number of children alive

150. Causes of child death in the family

151. Health status of the children

152. Reasons for the deficient health status of the children

153. Immunisation status of the children

154. Details of diseases by which the children were suffered during the past

155. Type of consultation taken up during the illness of children

156. Type of medicines given to the children

157. Health status of the respondent

158. If you have any disease, whom do you consult

159. Do you take medicines prescribed by the doctor

Energy utilisation

160. Distance between the home and working place

161. How much time you require to reach the working place

162. How you go to the working place

Details regarding the participation of agricultural activities

163. Time of starting the work

164. Time of ending the work

165. Total working hours/day

166. Total working days within a week

167. Number of days without work in a week

168. How many years you are doing this work

169. Type of leisure time activity

Daily routine of the respondent

170. At which time you go to bed

171. Awakening time

172. Before going to your work, what are all the household activities you do

173. Time of departure from your home for work

174. Time of arrival to your home after work

175. Works you do after you return from work

176. Details of family members who helps in the daily house work

177. Details regarding after subsidiary occupations undertaken by the respondent

178. Time spent in subsidiary occupation/day by the respondent

Details regarding the respondent

179. Details regarding the unhealthy habits of the respondent

180. Type of breakfast taken

181. Type of lunch taken

182. Type of evening snacks taken

183. Type of snacks between meals

184. Resting time after lunch

185. Occasion in which the respondent does not go to the job

186. Problems due to work outside the home

187. Influence of outside work on health condition

188. What is your opinion about the work

189. Problems faced by the working women

190. How many months did you work during the pregnancy period

191. Do you go to work during lactating period

192. How many days you take rest after delivery

193. Are your children are happy without your presence at home

194. Do you take your younger child to the work spot

195. Do you breast feed your child in between your work interval

196. In your absence, who supervise the feeding the child

## APPENDIX II

### Family and Individual food Consumption Survey Weighment Method

Name of the Investigator : Serial No.

Name of the head of the family : Address:

Name of the respondent :

Age of the respondent : Date:

### Food Consumption

| Name of the meal | Menu | Weight of the total raw ingredients used by the family (g) | Weight of total cooked food consumed by the family (g) | Amount of cooked food consumed by the respondent (g) | Raw equivalents used by the individuals (g) |
|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) |
| Breakfast | | | | | |
| Lunch | | | | | |
| Tea | | | | | |
| Dinner | | | | | |
| Others | | | | | |

## APPENDIX III

Kerala Agricultural University
Department of Home Science
Vellayani, Trivandrum

Food Consumption and Energy Expenditure Pattern of Agricultural Labourers of Trivandrum District

Nutrition Assessment Schedule

District : Taluk : Village:

Serial No: Family: Block:

Name of the respondent :

Full address of the respondent :

Annual income :

Age :

Sex :

Anthropometry

Height :

Weight :

Clinical examination

1. Hair sparse
2. Discoloured
3. Easily plucked
4. Moon face
5. Parotid enlargement
6. Oedema
7. Emaciation
8. Conjunctival xerosis
9. Bitot's spot
10. Corneal xerosis/keratomalacia
11. Corneal opacity
12. Night blindness
13. Photophobia
14. Anaemia
15. Nassolabial dyssebacia
16. Angular stomatitis

17. Cheilosis
18. Red and raw
19. Tongue papillae atrophy
20. Papillae hypertrophic
21. Pellagra
22. Crazy pavement dermatozis
23. Pigmentation at knuckles/ finger/toes
24. Phynoderma
25. Koilonyechia
26. Gum spongy bleeding
27. Epiphyseal enlargement
29. Beading of ribs
30. Knock knee/bowlegs
31. Fronto parietal boosing
32. Teeth carries
33. Enlargement of spleen
34. Enlargement of liver
    soft
    firm
    hard
35. Thyroid enlargement
36. Others

## APPENDIX IV

### Haemoglobin-cyanomethaemoglobin method

Principle

Haemoglobin is converted into cyanomethaemoglobin by the addition of potassium cyanide and ferricyanide. The colour of cyanomethaemoglobin is read in a photoelectric calorimeter at 540 nm against a standard solution since cyanide has the maximum affinity for haemoglobin. This method estimates the total haemoglobin.

Reagent

Drabkin's solution: Dissolve 0.05 g of potassium cyanide, 0.2 g of potassium ferricyanide and 1 g of sodium bicarbonate in one litre distilled water.

Procedure: 20 ml of blood are measured accurately from a haemoglobin pipette and delivered on to a Whatman No.1 filter paper disc. The filter paper is air dried, labelled and can be stored upto one week. The portion of filter paper containing the blood is cut and dipped in 5 ml Drabkin solution taken in a test tube. Wait for 30 minutes and mix the contents on a vortex mixture and take the readings.

Construction of standard curve

If the blood drawn from subject contain haemoglobin 15 g/dl after estimation then prepared the reference standards as follows:

1. Reference standard A

4 ml blook ın 1000 ml Drabkın's reagent contaın haemoglobın 15 g/dl.

2. Reference standard B

300 ml of reference standard A + 200 ml of Drabkin's reagent contain haemoglobin concentration of 10 g/dl.

3. Reference standard C

200 ml of reference standard A and 300 ml of Drabkın's reagent contaın a haemoglobin concentration of 75 g/dl/

Thus we have those reference standards at three levels of haemoglobin concentration. Use 5 ml from each standard whenever haemoglobin estimations are done.

## APPENDIX V

Purchasing pattern of various food articles in comparison with cereals

| Particulars | Male respondent | Female respondent | Male and female respondent |
|---|---|---|---|
| Pulses | 0.0806 | 0.4018** | 0.2101* |
| Vegetables | 0.1420 | 0.2703** | 0.2408* |
| Roots and tubers | 0.3113 | 0.1831 | 0.2462* |
| Fish | 0.2111 | 0.3647** | 0.2840** |
| Nuts & Oilseeds | 0.2354* | 0.1485 | 0.2285* |
| Fats & oils | 0.4288** | 0.2106 | 0.3345** |
| Sugar & jaggery | 0.3698** | 0.1666 | 0.2549** |
| Spices & condiments | 0.3156** | 0.2789* | 0.3062** |

*Significant at 5% level
**Significant at 1% level

## APPENDIX VI

Purchasing pattern of various food articles in comparison with pulses

| Particulars | Male respondent | Female respondent | Male and female respondent |
|---|---|---|---|
| Green leaves | 0.2746* | 0.3625** | 0.2960** |
| Vegetables | -0.0636 | 0.3301** | 0.1213 |
| Meat | 0.1296 | 0.3134** | 0.2044* |
| Spices and condiments | 0.1836 | 0.3867** | 0.2670** |

* Significant at 5% level
** Significant at 1% level

## APPENDIX VII

Influence of family income on purchasing pattern

| Particulars | Male respondent | Female respondent | Male and female respondent |
|---|---|---|---|
| Cereals | 0.3928** | 0.5235** | 0.4746** |
| Pulses | 0.4020** | 0.4742** | 0.4136** |
| Green leaves | 0.2301* | 0.3314** | 0.2428* |
| Vegetables | 0.0732 | 0.3762** | 0.2859** |
| Roots and tubers | 0.1710 | 0.3067** | 0.2463* |
| Milk and milk products | 0.2012 | 0.3746** | 0.2668** |
| Fruits | 0.0286 | 0.3429** | 0.1729 |
| Egg | 0.0807 | 0.3256** | 0.1977* |
| Fish | 0.3972** | 0.4033** | 0.4018** |
| Meat | 0.2291* | 0.3441** | 0.2853** |
| Nuts & oil seeds | 0.1389 | 0.3590** | 0.2854** |
| Fats and oils | 0.4349** | 0.4556** | 0.4505** |
| Sugar and jaggery | 0.5142** | 0.3166** | 0.3898** |
| Spices and condiments | 0.4446** | 0.3803** | 0.4124** |

* Significant at 5% level
** Significant at 1% level

## APPENDIX VIII

Utilisation of home produced foods

Utilisation of vegetables produced at home (annum)

| Quantity prduced (kg) | Used | | | | | Sold | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Kg | 25% | 26-50% | 51-75% | 75% | Kg | 25% | 26-50% | 51-75% | 75% |
| 9 | 5 | - | - | 55.55 | - | 4 | - | 44.55 | - | - |
| 9 | 9 | - | - | - | 100 | - | - | - | - | - |
| 10 | 10 | - | - | - | 100 | - | - | - | - | - |
| 20 | 3 | 15 | - | - | - | 17 | - | - | - | 85.00 |
| 30 | 4 | 13.33 | - | - | - | 26 | - | - | - | 86.66 |
| 33 | 3 | 9.09 | - | - | - | 30 | - | - | - | 90.90 |

Contd.

Milk and milk products produced at home/day

| Quantity in litres | Quantity produced | | | | | | Used | | | | | | Sold | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | | Female | | Total | | Male | | Female | | Total | | Male | | Female | | Total | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| 1 | 6 | 8 | 5 | 6.66 | 11 | 7.33 | 17 | 22.66 | 9 | 12.0 | 26 | 17.33 | 1 | 1.33 | - | - | - | 0.66 |
| 1-3 | 1 | 1.33 | - | - | 1 | 0.66 | - | - | 1 | 1.33 | 1 | 0.66 | 4 | 5.33 | 2 | 2.66 | 6 | 4.00 |
| 3-5 | 3 | 4.0 | 2 | 2.66 | 5 | 3.33 | - | - | - | - | - | - | 4 | 5.33 | - | - | 4 | 2.66 |
| 5-7 | 5 | 6.66 | - | - | 5 | 3.33 | - | - | - | - | - | - | 1 | 1.33 | 1 | 1.33 | 2 | 1.33 |
| 7-9 | 2 | 2.66 | 3 | 4.00 | 5 | 3.33 | - | - | - | - | - | - | 1 | 1.33 | 2 | 2.66 | 3 | 2.00 |
| Nothing | 58 | 77.33 | 65 | 86.66 | 123 | 82.00 | 58 | 77 | 65 | 86.66 | 123 | 82.0 | 64 | 85.33 | 70 | 93.33 | 134 | 89.33 |
| | 75 | 100 | 75 | 100 | 150 | 100 | 75 | 100 | 75 | 100 | 150 | 100 | 75 | 100 | 75 | 100 | 150 | 100 |

Eggs produced at home/month

| Quantity in number/ month | Quantity produced | | | | | | Used | | | | | | Sold | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | | Female | | Total | | Male | | Female | | Total | | Male | | Female | | Total | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| 4-6 | 1 | 1.33 | 1 | 1.33 | 2 | 1.33 | 1 | 1.33 | 1 | 1.33 | 2 | 1.33 | - | - | - | - | - | - |
| 6-8 | 5 | 6.66 | 6 | 8.00 | 11 | 7.33 | 5 | 6.66 | 6 | 8.00 | 11 | 7.33 | - | - | - | - | - | - |
| 8-10 | 1 | 1.33 | 1 | 1.33 | 2 | 1.33 | 1 | 1.33 | 1 | 1.33 | 2 | 1.33 | - | - | - | - | - | - |
| Above 10 | - | - | 1 | 1.33 | 1 | 0.66 | - | - | 1 | 1.33 | 1 | 0.66 | - | - | - | - | - | - |
| Nothing | 68 | 90.66 | 66 | 88.0 | 134 | 89.33 | 68 | 90.66 | 66 | 88.0 | 134 | 89.33 | 75 | 100 | 75 | 100 | 150 | 100 |
| Total | 75 | 100 | 75 | 100 | 150 | 100 | 75 | 100 | 75 | 100 | 150 | 100 | 75 | 100 | 75 | 100 | 150 | 100 |

Roots and tubers produced at home/annum

| Quantity in kilogram | Quantity produced | | | | | | Used | | | | | | Sold | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | | Female | | Total | | Male | | Female | | Total | | Male | | Female | | Total | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| 26-50 | 1 | 1.33 | - | - | 1 | 0.66 | 1 | 1.33 | - | - | 1 | 0.60 | - | - | - | - | - | - |
| 51-75 | 3 | 4.00 | - | - | 3 | 2.00 | 3 | 4.0 | - | - | 3 | 2.00 | - | - | - | - | - | - |
| 76-100 | 5 | 6.66 | - | - | 5 | 3.33 | 5 | 6.66 | - | - | 5 | 3.33 | - | - | - | - | - | - |
| Above 101 | 1 | 1.33 | 2 | 2.66 | 3 | 2.00 | 1 | 1.33 | 2 | 2.66 | 3 | 2.00 | - | - | - | - | - | - |
| Nothing | 65 | 86.66 | 73 | 97.33 | 138 | 92.00 | 65 | 86.66 | 73 | 97.33 | 138 | 92.00 | 75 | 100 | 75 | 100 | 150 | 100 |
| Total | 75 | 100 | 75 | 100 | 150 | 100 | 75 | 100 | 75 | 100 | 150 | 100 | 75 | 100 | 75 | 100 | 150 | 100 |

Fruits produced at home/annum

| Quantity in kilograms | Quantity produced | | | | | | Used | | | | | | Sold | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | | Female | | Total | | Male | | Female | | Total | | Male | | Female | | Total | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| 50 | 1 | 1.33 | - | - | 1 | 0.66 | 1 | 1.33 | - | - | 1 | 0.66 | - | - | - | - | - | - |
| Nothing | 74 | 98.66 | 75 | 100 | 149 | 89.33 | 74 | 98.66 | 75 | 100 | 149 | 99.33 | 75 | 100 | 75 | 100 | 150 | 100 |
| Total | 75 | 100 | 75 | 100 | 150 | 100 | 75 | 100 | 95 | 100 | 150 | 100 | 75 | 100 | 75 | 100 | 150 | 100 |

Nuts and oil seeds produced at home/annum

| Quantity in numbers | Quantity produced | | | | | | Used | | | | | | Sold | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | | Female | | Total | | Male | | Female | | Total | | Male | | Female | | Total | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| 10 | - | - | 2 | 2.66 | 2 | 1.33 | - | - | 2 | 2.66 | 2 | 1.33 | - | - | - | - | - | - |
| 11-50 | - | - | 6 | 8.00 | 6 | 4.00 | 5 | 6.66 | 8 | 10.66 | 13 | 8.66 | 1 | 1.33 | 1 | 1.33 | 2 | 1.33 |
| 51-100 | 9 | 12.0 | 4 | 5.33 | 13 | 8.66 | 14 | 18.66 | 3 | 4.0 | 17 | 11.33 | 5 | 6.66 | 1 | 1.33 | 6 | 4.00 |
| 101-150 | 3 | 4.00 | 1 | 1.33 | 4 | 2.66 | 4 | 5.33 | 1 | 1.33 | 5 | 3.33 | - | - | 1 | 1.33 | 1 | 0.66 |
| 151-200 | 5 | 6.66 | - | - | 5 | 3.33 | 4 | 5.33 | - | - | 4 | 2.66 | - | - | - | - | - | - |
| 201-300 | 10 | 13.33 | 2 | 2.66 | 12 | 8.00 | 8 | 10.66 | 1 | 1.33 | 9 | 6.00 | 2 | 2.66 | - | - | 2 | 1.33 |
| Above 301 | 5 | 6.66 | 1 | 1.33 | 6 | 4.00 | 2 | 2.66 | 1 | 1.33 | 3 | 2.00 | - | - | - | - | - | - |
| Nothing | 43 | 57.33 | 59 | 78.66 | 102 | 68.00 | 48 | 64.00 | 59 | 78.66 | 107 | 71.33 | 67 | 89.33 | 72 | 96.0 | 139 | 92.66 |
| Total | 75 | 100 | 75 | 100 | 150 | 100 | 75 | 100 | 75 | 100 | 150 | 100 | 75 | 100 | 75 | 100 | 150 | 100 |

## APPENDIX IX

Preparation of food articles prior to cooking by the home makers

Distribution of labourers with reference to preliminary preparation on vegetables before cooking

| Particulars | A | | B | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Washed after cutting into small pieces (immediately before cookin) | 25 | 33.33 | 35 | 46.67 | 60 | 40.00 |
| Washed after cutting into big pieces (immediately before cooking) | 14 | 18.67 | 9 | 12.00 | 23 | 15.33 |
| Washed before cutting and washed after cutting | 36 | 48.00 | 31 | 41.33 | 67 | 44.67 |
| Total | 75 | 100.00 | 75 | 100.00 | 150 | 100.00 |

Distribution of labourers with reference to preliminary preparation on animal foods before cooking

| Particulars | A | | B | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Washed after cutting into small pieces (immediate before cooking) | 53 | 70.67 | 64 | 85.33 | 117 | 78.00 |
| Washed after cutting into big pieces (immediately before cutting) | 22 | 29.33 | 11 | 14.67 | 33 | 22.00 |
| Total | 75 | 100.00 | 75 | 100.00 | 150 | 100.00 |

A - Families of male agricultural labourers

B - Families of female agricultural labourers

Contd.

Distribution of labourers with reference to preliminary preparation on pulses before cooking

| Particulars | A | | B | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Soaked before cooking | 1 | 1.33 | 1 | 1.33 | 2 | 1.33 |
| Cooked without removing the skin | 2 | 2.67 | 3 | 4.00 | 5 | 3.33 |
| Germinated | 2 | 2.67 | 0 | 0 | 2 | 1.33 |
| Soaked or not soaked before cooking | 27 | 36.00 | 49 | 65.34 | 76 | 50.67 |
| Thoroughly washed before cooking | 43 | 57.33 | 22 | 29.33 | 65 | 43.34 |
| Total | 75 | 100.00 | 75 | 100.00 | 150 | 100.00 |

Distribution of labourers with reference to preliminary preparation on roots and tubers before cooking

| Particulars | A | | B | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | |
| Washing after cutting into small pieces immeiately before cooking | 12 | 16.00 | 16 | 21.33 | 28 | 18.67 |
| Washed after cutting into big pieces immediately before cooking | 31 | 41.34 | 37 | 49.34 | 68 | 45.33 |
| Soaked before cooking | 31 | 41.33 | 22 | 29.33 | 53 | 35.33 |
| Washed after cutting into small pieces and kept it for long time before cooking | 1 | 1.33 | - | - | 1 | 0.67 |
| Total | 75 | 100.00 | 75 | 100.00 | 150 | 100.00 |

## APPENDIX X

Cooking methods applied on cereals

| Methods | A | | B | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Boiling & straining method | 52 | 69.33 | 33 | 44.00 | 85 | 56.67 |
| Boiling & using as kanji | 23 | 30.67 | 42 | 56.00 | 65 | 43.33 |
| Total | 75 | 100.00 | 75 | 100.00 | 150 | 100.00 |

Cooking methods applied on vegetables

| Methods | A | | B | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Frying | - | - | 1 | 1.33 | 1 | 0.67 |
| Boiling and straining | - | - | 2 | 2.67 | 2 | 1.33 |
| Boiling and seasoning | 58 | 77.33 | 63 | 84.00 | 121 | 80.67 |
| Steaming | - | - | 3 | 4.00 | 3 | 2.00 |
| Boiling | 17 | 22.67 | 6 | 8.00 | 23 | 15.33 |
| Total | 75 | 100.00 | 75 | 100.00 | 150 | 100.00 |

A - Families of male agricultural labourers
B - Families of female agricultural labourers

Contd.

Cooking methods applied on pulses

| Methods | A | | B | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Steaming | 5 | 6.67 | 1 | 1.33 | 6 | 4.00 |
| Boiling and seasoning | 56 | 74.67 | 56 | 74.67 | 172 | 74.67 |
| Steaming and frying | 6 | 8.00 | 15 | 20.00 | 21 | 14.00 |
| Roasting | 8 | 10.66 | 3 | 4.00 | 11 | 7.33 |
| Total | 75 | 100.00 | 75 | 100.00 | 150 | 100.00 |

Cooking methods applied on roots and tubers

| Methods | A | | B | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Steaming | 71 | 94.67 | 61 | 81.33 | 132 | 88.00 |
| Steaming and straining | 4 | 5.33 | 14 | 18.67 | 18 | 12.00 |
| Total | 75 | 100.00 | 75 | 100.00 | 150 | 100.00 |

Contd.

Cooking methods applied on animal foods (fish)

| Methods | A | | B | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Frying | 19 | 25.33 | 21 | 28.00 | 40 | 26.67 |
| Boiling and seasoning | 36 | 48.00 | 31 | 41.33 | 67 | 44.67 |
| Boiling | 20 | 26.67 | 23 | 30.67 | 43 | 28.67 |
| Total | 75 | 100.00 | 75 | 100.00 | 150 | 100.00 |

# FOOD CONSUMPTION AND ENERGY EXPENDITURE PATTERN OF AGRICULTURAL LABOURERS OF TRIVANDRUM DISTRICT

By

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**ABSTRACT OF A THESIS**

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## ABSTRACT

The study on the "Food consumption and energy expenditure pattern of agricultural labourers of Trivandrum District" comprises the socio-economic and food consumption profile of the families of agricultural labourers with specific reference to their actual food intake, energy expenditure and nutritional status.

Families surveyed were nuclear type families belonging to underprevilaged communites. Family income was directly proportional to the number of persons employed in the family. As the income increased, the percentage of income spent on food decreased. Majority of the labourers were free from debt and were conscious of saving for future.

Families surveyed were non vegetarians by habit. Rice, tapioca, fish, coconut, locally cultivated vegetables, milk, cooking oils and sugar were the main items included in their daily diets. Home porduction of food articles helped to improve the consumption pattern of the families qualitatively but not quantitatively. Majority of the labourers followed unscientific culinary practices in cooking and storage of food articles.

Unbalanced, monotonus meal pattern was observed among the families. Compared to other stages of life, special attention for feeding were given only during infancy and preschool period.

No special foods were given during adolescent period or for women during pregnancy and lactation. Irrespective of the nutritional requirements of the family members, first preference was given to the head of the family while serving food.

The labourers selected were getting employment for 24 days in a month and health status were also satisfactory. Besides outside employment, female labourers were fully responsible for household tasks and child care practices. Compared to female labourers, unhealthy habits were prevalent more among males. Because of the outside employment of the mother, growth of the children were adversely affected.

Consumption of food quantitively and availability of nutrients from the meal were not satisfactory in the two groups surveyed. The nutrients like energy, retinol, thiamine and riboflavin were deficient in the diets of male agricultural labourers, while iron, retinol and riboflavin were deficient in the diets of female agricultural labourers. In the two groups energy expenditure was more than energy intake. Haemoglobin level was better among male labourers. The data when statistically analysed, indicated a significant correlation between height and weight and Nutritional Status Index (NSI) and Body Mass Index (BMI) for male labourers and BMI and weight and BMI and energy expenditure for female labourers. Significant correlation developed in the Nutritional Status Index ([redacted]) of male agricultural labourers.