FOOD AVAILABILITY AND CONSUMPTION PATTERN IN FARM AND AGRO-INDUSTRY WORKERS' FAMILIES OF SIDAMO AGRICULTURAL DEVELOPMENT ENTERPRISE

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ABSTRACT

Household food consumption patterns of farm worker families (rural) and agro-industry worker families (urban) of Sidamo Agricultural Development Enterprise were studied. The objectives were: to determine the types of food eaten and calories available to the families relative to calories needed; to examine differences between the two occupational groups in food consumption; and to test adequacy of food intake in relation to money, sources of food, facilities, family constellation, housing and food related practices. An inadequate intake of below 80% of the required was observed in 70% of the sample, 16% were below 40% of required, with a significantly lower intake for the agro-industry group. Comparison of the groups revealed that the farm families were better off in education, salary, reliance on many different sources of food, and in having less storage food loss; and agro-industry group in facilities, nutrition education, and housing. From the six sets of determinant variables salary positively, and family size negatively were significantly associated with level of food intake. At middle levels of per capita salary, the farm worker families had a significantly higher intake than the agro-industry families, whereas at lower and higher per capita levels, they consumed equal amounts. Reasons for this difference were discussed and recommendations made.

INTRODUCTION

Undernutrition is a state arising from an inadequate intake in quantities of food, and hence of energy over an extended period time (1). Decreased body weight is its principal manifestation. The amount of energy required is basically determined by the person's body size, composition, and level of physical activity; intestinal worm infestation or other infections generate high nutrient requirements (2). There are three types of food inadequacy, namely malnutrition, seasonal hunger, and famine. Nutritionists are also concerned with specific deficiencies such as vitamins and minerals, but their primary concern is for adequate energy intake.

The number of undernourished people is increasing on a worldwide basis, and particularly in developing countries (3). In Ethiopia a survey conducted in 1980 by the Ethiopian Nutrition Institute found 26.7% of the children under 5 years to be below 80% of the median reference of weight for age using the Harvard standard (4). For comparison purposes, Keller and Fillmore (5). reported the percentage of under-fives who were wasted, stunted, and underweight (for age) in many African countries, taken from surveys conducted in the late 1970's. For Ethiopia, the figures were 6.4% wasted, 18.50% stunted, and 28.6% underweight (i.e. less than 80% of the standard). In comparison, Sudan had less malnutrition for the different age categories, figures ranged from 9.0% to 22.0% underweight. Within Ethiopia, data for 11 administrative regions showed that Wollega, Keffa, Wollo and

Hararge were worse than the national average of 26.7% underweight; whereas Sidamo, Shoa, Arsi, and Gojam were better with rates between 20% and 25% (4). A more recent study (6) reported prevalence of malnutrition in different regions of Ethiopia; the lowest was 27% underweight in Addis Ababa and Hararge, and the highest was 46% underweight in Wollo. Sidamo had a rate of 28%. Low food intake is thought to account for these prevalence rates of malnutrition (7). In summary, Ethiopia has a serious problem of under-nutrition, and the region of Sidamo appears to be on a level with or slightly better than the national average.

Potter (8) outlines three outcomes of malnutrition: low anthropometric scores, physical and/or mental impairment, and in severe untreated cases death. Food intake is significantly related to anthropometric measures. Hagga et al.(9) have shown that food intake has a direct linear relationship to weight and height for age. Sigman et al.(10) have shown that a child's food intake and anthropometric scores are directly correlated with type of play behaviour, verbalization, and intelligence. Furthermore, food intake remained related to these outcomes even when family education and home-rearing variables were considered. Therefore, food intake has important consequences for nutritional status activity level, physical and intellectual development.

In order to pursue a productive and healthy life, the amount of food eaten must meet the person's energy needs(11). The under-nourished child may become a failure at school, condemned to low-paid casual labour for the rest of his/her life. Among adults,

poor nutrition leads to poor health and low economic productivity. Thus, malnutrition aggravates the poverty that causes it as the under-nourished worker can not produce as much as the well-fed one.

Nutritional status is directly related to food consumption (10), which in turn depends on what is available at the household level (12). Although it is possible to find data on food availability at the national level, there is too little at the household level. Food availability at the household level is dictated by three types of factors (12,13,14):

a. Local agriculture (production, storage, distribution, price, and availability in markets).
b. Socio-economic factors such as income, expenditure on food, ownership of vegetable gardens and domestic animals, facilities such as market, flour-mill, and transportation.
c. People's likes, dislikes, and cultural beliefs about food.

Agriculture is the mainstay of the Ethiopian economy where about 86 percent of the population relies on farming for its livelihood with the vast majority of peasants engaged in subsistence agriculture. Drought in Ethiopia has been a major cause of food shortage and hunger in much of the country in recent years. However even in good years there is shortfall of some 250,000 tons of cereals annually due to low productivity among traditional farmers (12). A second problem is population growth which has increased at a faster rate than the growth of the economy, with the result that per capita income and per capita food availability and other services have declined.

State farms are one means of improving agricultural productivity by rationalizing labour and technology. They occupy 3% of the total cultivated area, and contribute 6% of the combined production of cereals and pulses (12). The Sidamo Agricultural Development Enterprise (SADE) is a state farm employing 2,181 workers at the farms and 343 workers at its agro-industries. An initial look at the food supply situation and other environmental factors indicated the potential for low food intake (15). Low wages and the small quantity of subsidised grain purchase suggested an inadequate supply of food for families. The absence of market facilities hindered families from buying the necessary additional food items at the level they need. Further, families are not encouraged by the administration to engage in income generating activities which could greatly enhance food supply and significantly improve their nutritional status. In addition, the farm sites were devoid of wild fruits or edible plants, and thus nutritional supplementation from such sources was absent.

Choice and use of food depends on what is at hand and people may rely on a single staple, such as rice, maize or cassava At SADE, the staple food is maize, made into unleavened bread, or mixed with tef and/or other cereals to make enjera. Maize is sold to workers at the subsidised rate of Birr 31.00/quintal (25 kg for a worker, with an extra 5 kg for every additional member of the family but not exceeding 60 kg).

The purpose of this research project was to estimate the magnitude of under-nutrition on this state farm and its underlying

causes, and come up with recommendations. People with poor nutritional status can not be expected to perform their tasks efficiently. This harms the enterprise as much as it does the workers, as its production targets can not be met.

General Objective

The general objective of this study was to determine the adequacy of the level of food intake among Sidamo Agricultural Development Enterprise farm and agro-industry workers' families and its relation to social and economic factors.

Specific Objectives

1. To determine the types of food eaten and calories available to the families relative to calories needed by family members.
2. To examine differences between agro-industry and farm workers in terms of:
   a. Demography
   b. Social and economic situations
   c. Food consumption in terms of level of food intake and types of food eaten.
3. To examine adequacy of food intake in relation to:
   a. Income and purchasing power
   b. Families' sources of food
   c. Availability of facilities like a market and mill
   d. Family constellation
   e. Housing conditions
   f. Food related practices in the family

LITERATURE REVIEW

The diets of local communities, different groups of people such as mothers and children, and various occupation groups such as industry and farm workers are of interest to those studying malnutrition. In such studies, there are three aspects to be considered (14) :

a. Assessment of the extent and severity of the nutritional problem,

b. The factors that lead to the problem, and

c. The means of prevention.

I. ASSESSMENT OF NUTRITIONAL PROBLEM

Assessment of the magnitude and seriousness of the nutritional problem can be made using one or a combination of indicators(1,16). In a community based survey a strict choice of indicators must be made to save time and money and avoid undue complexity. The selection is based in the first place on the relevance of the indicator to the local situation, and secondly on the feasibility of gathering information in a satisfactory manner. Indicators conventionally used are: clinical signs, anthropometry, biochemical data, indirect nutritional assessment, and food consumption at the household level.

The assessment of clinical signs is a relatively cheap method, since it does not require elaborate field equipment or a costly laboratory, but has two disadvantages. Firstly, actual clinical signs of malnutrition may be absent, although body measurements may show malnutrition to be widespread. Secondly,

clinical signs often lack specificity which makes recognition of signs difficult, contrary to the assumption that clinical examination is simple and can be mastered even by beginners.

Selected body measurements or anthropometry can give valuable information concerning certain types of malnutrition in which body size and gross body composition are affected. Indices used such as weight, height, arm and chest circumference give information on past consumption only. The major limitation is that anthropometric measures are not usually taken of adults because reliable standards are not available for adolescents or adults.

Biochemical methods in their simplest form include blood and urine examinations, requiring some form of laboratory set-up and trained personnel, which makes it costly and time-consuming.

Indirect nutritional assessment methods require the existence of an efficient recording and registry system. The method employs vital statistics, age-specific mortality rates, morbidity and cause-specific mortality rates, and nutritionally relevant diseases. Because of their indirectness, these methods do not give a timely picture of current nutritional problems.

Food consumption at the household level is useful both for assessing current nutritional status and discovering causative factors that can be corrected. This form of assessment measures variations of food by source, and by season, with consumer characteristics and geographical areas. Furthermore, it provides the only basis for measuring the relationship among these variations (17).

There are two kinds of measurements used in food consumption surveys (18). One relies on inquiry with a group of people being asked about their diet, and the other on direct observation of the types and weight of food consumed over a given period of time. Neither method takes account of past food consumption or distribution within the family. Though crude and simple, these methods provide data that clearly indicate if anything is wrong with the diet.

1. Diet Inquiry and Recall

Inquiry cannot give very accurate information on amount of energy or nutrients consumed. However it can give an indication of the frequency of meals, the methods of food preparation and cooking, as well as providing details of the amount of each food eaten. In developing countries where the level of education is not high and where communication facilities are not well-developed it is usual for a survey worker to go to households, ask the wife questions about the diet (14). With a 24-hour recall interview, the respondents are asked to describe in as much detail as possible the food intake for the previous 24-hour period. The greatest drawback of the method is the questionable reliability of a single day's intake as a measure of habitual intake(1). The 24-hour recall is not the instrument of choice to assess individual dietary status but does yield a fairly accurate group profile particularly when daily meals do not vary much.

2. Direct Observation

Assessment of food consumption is usually carried out by

visiting households and recording the quantities of all foods eaten during a set period, by weighing and measuring them in the raw state, and also if methods of cooking are fairly standard, by weighing cooked food portions. At the same time, details of who consumes the food (age and gender) are collected. Home visiting usually covers a period of not less than three days, preferably seven days. Often however, a shorter period of observation may be sufficient in developing regions, where the diet tends to be limited in the types of food consumed.

The energy value of the foods weighed is calculated using food composition tables containing references to local foods (1). Energy intake is then calculated per capita per day. Most surveys use the family as a basic unit (14). The number of visitors eating occasional meals and number of meals eaten outside the home by members of the family are noted and arbitrary correction made. Data on food distribution within the family are scarce, because most food consumption studies report only on the aggregate consumption at household level. Qualitative evidence indicates that distribution is generally related to hierarchial position with the head of the household and its income earning members receiving preference (19). In the Ethiopian situation, the traditional system of sharing food from one common plate makes the calculation of consumption for specific family members difficult (20).

A comparison of the nutritive values of food with standard nutritional requirements, corrected for age and sex, laid down by FAO and similar bodies, is calculated (21). Caloric intake can

then be expressed as a percentage of the requirement.

In agricultural societies such studies are repeated to cover seasonal variations. In such countries, seasonal climatic changes determine the production and availability of food-stuffs. Studies (22,23) have shown that nutritional status changed significantly by month of year.

II. DETERMINANTS OF MALNUTRITION

Six sets of variables socio-economic, agricultural, facilities for food acquisition and processing, growth in population, housing, and cultural factors are all believed to have impact on food availability and consumption.

1. Socio-economic

Food intake inadequacy could result from unequal distribution of food and/or lack of education and nutrition unawareness (2), but nutrition awareness in the absence of economic means has little efficacy. This is supported by Kurth (24) who states that while women are the main recipients of nutrition education, they do not necessarily control household income allocation and thus may be unable to actualize this education in their purchase of food for the family. Maternal illiteracy as a cause of malnutrition is not supported by a WHO report (2). Hagga et al.(9) have however shown a positive correlation between the illiteracy rate among women and prevalence of child malnutrition. They also found that the distribution of income within countries influenced the prevalence of malnutrition. They showed that in a country with great inequality in the distribution of income, malnutrition would be

more prevalent, given a certain level of food availability. In another study (24), the author compared the nutritional status of those living inside and outside a Development Project to determine whether those inside fared better. the result was although the project children were better off with regards to village environment and family income, their nutritional status was not significantly higher than children who lived outside.

Huntsman (25) found that misallocation of income within the family and poor dietary practices contributed more to malnutrition than did low income amongst the labourers' families she studied. Similarly, Bryceson (2) blamed misallocation as the main cause of malnutrition in an urban situation where often the earner, usually male, spends the bulk of the money himself rather than handing it over to the person in charge of food preparation, namely women. Men are less likely than women to spend their money on food, as the food requirement of the family is seldom their primary concern.

2. Agricultural/Food Acquisition and Production

Insufficient production is a chronic problem and arises from a multitude of causes: climatic irregularities, soil erosion, inefficient farming and war (14). Rain-dependent African agriculture can not stand climatic variations, and even one year of drought can lead to famine and reliance on foreign aid (26).

Absence of proper storage facilities diminishes the amount of available food for families due to storage losses. An estimated 25% of all food produced in Africa may not be consumed by man, but gets spoiled or eaten by insects, rats and other pests (27).

3. Facilities for food acquisition and processing

Foods can be obtained through purchase and production. The proximity of market places, shops and the food items found in them have an impact on food intake (1). Facilities for processing and preparing foods also influence nutrition of households (28). In Ethiopia, foods for local consumption are processed mainly by housewives and stored in individual homes (29). Processing includes drying, cleaning, roasting, and/or grinding of grains, and the baking of enjera and bread. The presence or absence of a flour-mill in any community affects the amount of time and energy required to process grains, and therefore what one can eat.

4. Growth in Population

The population explosion is among the most discouraging of all the problems that the developing countries face. The situation would not be so alarming if the production of consumer goods and above all of foodstuffs was expanding at a faster rate. Growth rates of production however are negligible when compared with the extraordinary leap forward in population size. Moreover the population is growing most rapidly in the areas that are experiencing the greatest nutritional difficulties (30).

The phenomenon of underdevelopment lies essentially in the large gap between a fast population growth rate and a stagnant economy. This pattern repeats itself in every country that has been only partially influenced by the modern industrial revolution. The arrival of doctors and missionaries to these countries before agronomists has enabled children to survive epidemics but not to

eat enough food to lead decent lives (31). More people have been allowed to live to an older age but not enough employment has been created for them. Too rapid growth affects every problem, even where it is not itself the main cause of the problem. It accelerates land fragmentation and the exhaustion of soils. It raises the number of labourers looking for work and migrants into cities(32). It boosts inequality, increases landlessness, pulls wage levels down and keeps rents high. It helps keep the poor in poverty, as the poor tend to have larger families, and there is less food for each member. Therefore adults can not work well and children fail at school because of malnutrition and disease.

Potter (8), reported that although the average number of children does not appear to affect nutritional status in many cases, some studies have found a positive correlation between the number of children in a family and the incidence of malnutrition. Others have demonstrated that the critical factor was not the number per se but the close birth spacing (less than 2 years) frequently seen in large families.

5. Housing and sanitation

Housing conditions included variables such as ownership, kitchen facilities and sleeping area, water supply, waste and garbage disposal. Water related health problems especially diarrhoeal diseases are major contributors to malnutrition in the young, and frequent diseases inhibit proper utilization of available food (14,26). Without adequate water, it is impossible to control malnutrition and the many diseases responsible for high

morbidity and mortality (12). The environmental sanitation situation in Ethiopia is among the worst in the world, with less than 7% of the total population using adequate latrines (12). Eleven percent use safe water (33), most homes do not have separate kitchen facilities or bedrooms. Housing condition may not be directly related to food consumption, but it is an indirect index of economic status and infectious diseases.

6. Cultural Factors

Culture in most of the third world influences distribution within families, with the vulnerable categories of women and children receiving the least food. Hierarchial distribution of food is a vital family variable that affects the nutritional status of women and children (8). A study conducted in a farm worker community in Zimbabwe (34) showed rates of undernutrition ranging from 30% to 60.7% for different age-sex groups. There were more wasted females than males, and more malnourished children than adults. The impact of socio-cultural practices on food intake has also been shown in a study of dietary pattern among the rift valley Arsi Galla (35) where 30% of the adults were found to be grossly malnourished only in the season of scarcity, whereas in children under 3 years of age the 30% prevalence was observed in both the scarcity and harvest seasons. Religion prohibits the consumption of some foods and others are eaten during certain periods only. Taboos could lead to the exclusion of some foods for certain groups of people, particularly women and children. In one region in Ethiopia, children were not allowed to eat eggs, and shepherds

avoided milk from cattle because they believed they could loose their teeth (36). The Ethiopian Orthodox community have to observe about 135 fasting days each year (14) during which they should strictly avoid any food of animal origin.

MATERIALS AND METHODS

Study Design

This was a cross-sectional survey of permanent employees and their families concerned with the agro-industry and state farm, residing in Awassa town and 10 farm villages, respectively. The method used was a combination of observation and inquiry.

Source Population

The source population consisted of 1521 farm workers employed at Awassa-Wondo Tika and Bilito-Sinkille farms, and housed in 10 villages; and 343 agro-industry workers working inside Awassa town.

The Ministry of State Farms is made up of seven corporations that are directly accountable to it, with each corporation supervising more than one enterprise. An enterprise coordinates the activities of several farms within a given administrative region or defined geographical area. The Southern Agricultural Development Corporation (SADC) is one of such corporations and has under it three enterprises, one of which is Sidamo Agricultural Development Enterprise (SADE), with its head office located in Awassa town 273 km south of Addis Ababa.

SADE consists of Awassa-Wondo Tika (4765 hectares), and Billito-Sinkille (600 hectares), rain-fed farms that produce mainly

corn, sunflower, and sisal; and two small agro-industries, namely sisal and oil processing plants in Awassa town. Agro-industry workers live in Awassa town, and have access to facilities of the town such as asphalt roads, horse-drawn carts for local transport, postal and telephone services, piped water and electricity. In contrast, farm workers work and live on the farms outside of Awassa town, and have few such facilities available to them. The distance of farms from the town ranges between 5 and 90 km with a median of 35 km. The means of communication within the corporation, enterprise and farms is by radio. There are no roads linking farm villages with main roads; tracks cleared for four-wheel drive and farm vehicles are not useable by public transport.

There are no markets on the two state farms or nearby, and the absence of public transport has made shopping for families less frequent. The enterprise encourages the opening of communal shops by providing capital and facilities in an attempt to ease the problem. There are no formal schools; health service is rendered through three poorly-equipped and poorly-staffed clinics that have referral arrangements with the central clinic located at the head office. The referral system is however not functioning properly due to the lack of transportation and communication.

Study Population

The source population was stratified into two occupational groups, farm and agro-industry workers, and equal numbers were selected from each groups regardless of gender. Farm workers were chosen randomly from a list of households by house numbers and

agro-industry workers from the enterprise's master list. The selection was made by simple random sampling procedure using a table of random numbers (see figure 1). Administrative workers and employees in senior positions were excluded.

Sample Size Estimation

The required sample size (n) was estimated using the sample size calculation formula for a proportion. According to surveys described previously, prevalence of malnutrition in Sidamo ranged between 25 and 30 percent (2,3).

$$n = Z^2 \frac{P(1-p)}{L^2}$$

Z for alpha 0.05 = 1.96

p (Proportion) = 0.30

L (margin of error) = 0.07

$$= 3.84 \frac{0.3\ (0.7)}{(0.07)^2}$$

$$= 165$$

A sample of 201 households, 101 from and 100 from agro-industry groups, was taken to account for a 15% potential loss to follow-up or non-response. Of these, five were unable to be contacted because of their absence for many weeks. Therefore, the data for 196 households were analyzed, 95 from the agro-industry group and 101 from the farm worker group.

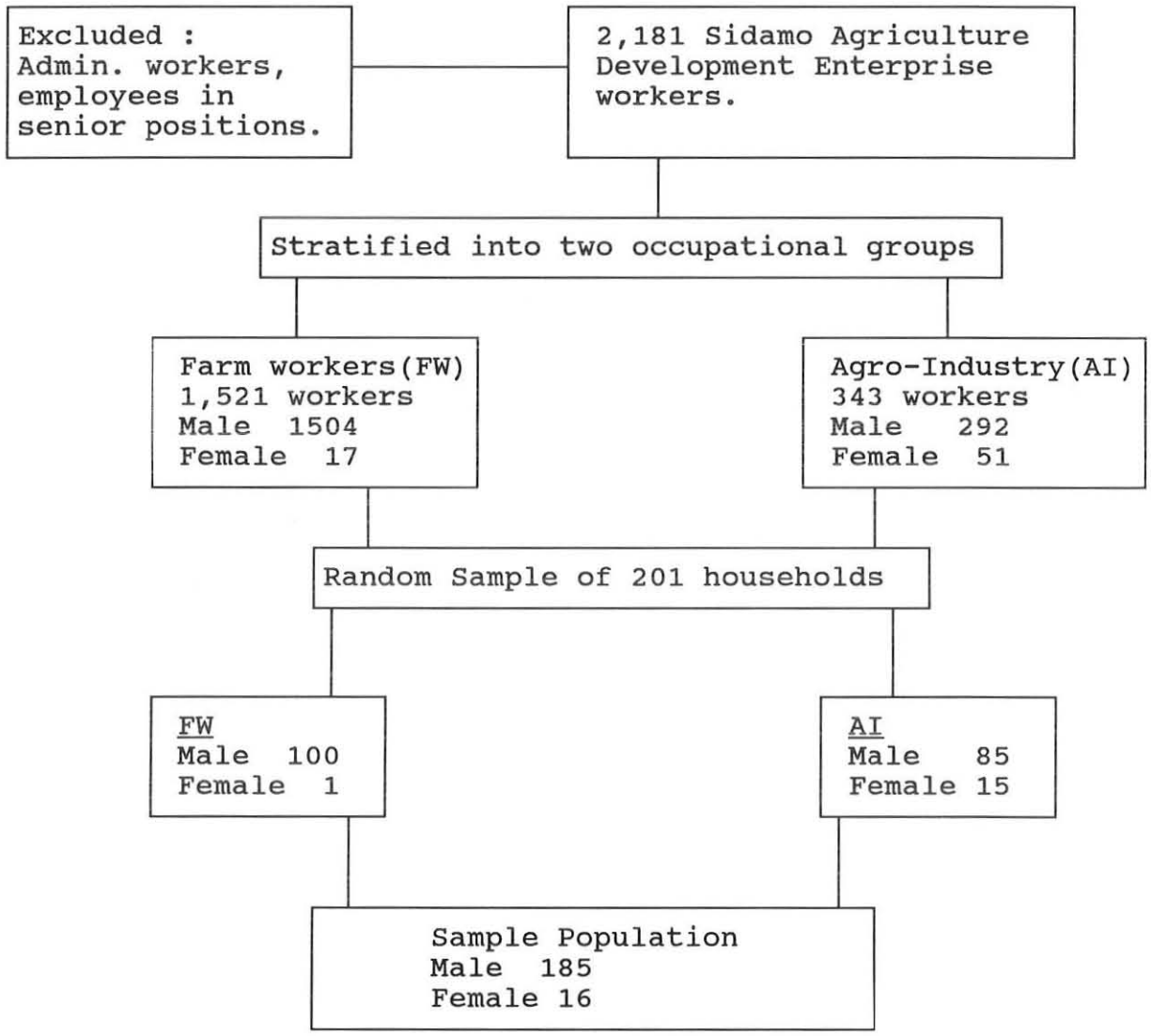


Figure 1. Sampling frame and selection hierarchy.

Level of Intake Estimation and Types of Food Eaten

The level of intake by household members was calculated in calories, relative to what is needed. A household is defined as one or more persons living together in the same dwelling or part of a dwelling and sharing common living arrangements. Food intake for the current day was assessed by weighing with a Salter scale all the food present in the house that was to be used for the day's meals. Each type of food (eg. maize flour) and its weight in grams were recorded. If any food was to be bought from the market, the respondent was asked how much money she expected to spend, and that amount of money was used by the investigator to determine the quantity in grams (i.e. the same amount was purchased, weighed and recorded). These were converted int calories using food composition table for use in Ethiopia (37). The calories for each type of food were totalled to produce the calories available for family consumption. Also any expected guests or family members absent for the day's meals were noted.

The required intake for a family was based on the WHO recommendation (38), given in appendix B, also used by Ethiopian Nutrition Institute, considering age, gender, and a level of physical activity set at a constant of moderate. Calculation of daily required energy of 10 families is shown in appendix C to demonstrate how it was worked out. Because of the low number of absent or additional people for meals, the original number of family members was used to calculate calories needed. The level of energy intake was then estimated by taking calories available

as a percentage of calories needed. Families were then classified into three ranges: 0 - 39.9% grossly deficient, 40% - 79.9% deficient, and ≥ 80% reasonably good, according to Selinus et al.(36).

The proportion of calories coming from each food group was calculated by dividing the number of calories from that food group by the total number of daily calories available to that family.

Information on the types of food eaten was obtained using the method of 24-hour recall. The housewife was asked what foods were eaten the previous day, for each meal or snack. It was assumed that the number of meals during which a particular food was eaten gave a crude estimate of its quantity. Common foods were listed in the questionnaire, and the woman was asked to give food items consumed starting from breakfast and continuing through all the meals of the day. If any food that was not in the list was mentioned, it was written down, and all the food items reported were ticked (see appendix A). For each food group, families were classified according to the number of meals during which they ate that food: none, low (1 or 2 times), and high (3 or more times).

Assessment of Family Characteristics

Information on demography, socio-economic conditions, food acquisition and processing, facilities, housing, and prior education on nutrition were obtained with a structured questionnaire for housewives (see Appendix A).

i. Data on demography i.e. age, sex, marital status, ethnicity, and religion were collected.

ii. The six major determinant variables were assessed in relation to the components that formed them and these were:

a. Socio-economic variables included income, expenses for food and non-food items (not analyzed because unreliable data), savings, and education of the employee. Nutrition education reported by the housewife was also assessed. Data on general education was obtained from the enterprise's master list and salary from payrolls. Total income consisted of salary plus any additional income. Savings is money gone on 'ekub' and bank deposits. Expenses were amounts of money spent on non-food items like bills, fees, and contributions.

b. Sources of food items were the open market, subsidized purchase and/or home production i.e. vegetable gardens and animals owned by the household. Subsidized food purchase consisted of maize (25 to 60 kg depending on family size) and 4 litres of oil that could be bought at a price below the market value. Also, the problem of rats and insects in food stores was studied.

c. Facilities were examined in terms of market accessibility, enough fuel for cooking, availability of a flour-mill, and need for transport for household activities. Need for transport was reported as yes if the family lived far away or had heavy load to carry. Each variable was scored as 0 (absent), and 1 (present), except for transport need where yes was scored as 0 and no as 1. The composite scores ranged from 0 - 4.

d. Family Constellation refers to family size and number of under-five children.

e. Housing condition refers to the physical characteristics of the house and its environment; namely ownership, roof, wall, floor, partition, windows, lighting, water supply, waste and garbage disposal. A score of 1 was given to each answer indicating good and 0 poor conditions.

f. Practices of food avoidance and taboos as they related to certain foods and certain individuals or groups were examined.

Data Collection

Data were gathered in June/July, 1990, by interviewing housewives using a structured questionnaire. The questionnaire was first developed in English and then translated into Amharic. It was given in the Amharic language though the interviewers also needed to speak a second local language (Oromigna, Wolayita, Kembata, Sidama). Five interviewers were selected and trained for a week before the survey started. Candidates were all female, with 12th grade education, residents of Awassa town, and above 20 years of age. The questionnaire was pretested using a sample of 20 families not in the actual survey, and problems were discussed. Based on this, necessary modifications were made to the quest ionnaire content and to recording data.

Interviewers were assigned to previously selected households according to the language spoken by the respective families. They were accompanied by the principal investigator on many occasions, especially on their first visits. Visits to households were started around 6:30am whenever possible, and latest by 8:00am when a long drive was necessary. The interviewers asked the wife to

show what food she intended to cook for that day, which was accurately weighed, and the number, sex, and age of the people in the household were recorded. The housewife was also asked questions about foods consumed in the previous 24 hours and related factors. At the end of each day, data were inspected for completeness by the researcher and problems discussed. In cases where housewives were absent, a return visit was made; other adult members were interviewed in situations where the housewife was absent for longer than three days. Supervision was done by the researcher: (a) go to houses picked at random and ask them if they had been interviewed, (b) interview a few families every now and again to compare with that of the interviewers.

Data Analysis

Data was analyzed using the SPAS/PC+ statistical package on single and composite variables, in the following sequence:

1. Frequency distributions of variables to examine overall characteristics of the study sample, and differences between the worker groups with respect to adequacy of energy intake.
2. Bivariate analyses to study the association between determinant variables and levels of energy intake using the chi square statistic and odds ratios (with 95% confidence intervals). This analysis was made for the sample as a whole and separately for each of the two occupational groups.
3. Multivariate analysis: Analysis of variance was performed on the variables that showed significant association, t-test was conducted to compare the two groups.

RESULTS

1. Characteristics of the Study Population

Demography The sample consisted of 196 Sidamo Agricultural Development Enterprise workers (180 men, 16 women), aged between 24 and 55 years, with a mean age of 39.3 years and their families. Of these 101 were engaged in farm work (FW) and 95 in agro-industrial(AI) jobs, such as oil pressing and sisal processing. Males predominated in both groups, 84.2% in the (AI) and 99% (FW) group are men. Most were married with only 9.6% in the (AI) and 2.0% in the (FW) group widowed or divorced. Both groups were predominantly Wolayta. The majority were Christians with only 9.7% Moslems and other religions.

Education The number of illiterates was low at 1.0% of the total sample but those with formal schooling were only 19.5%. The remaining reported that they could read and write, implying that they learned literacy skills in literacy campaign classes. Only 2 workers from the (AI) group had formal schooling, in contrast to 36 from the (FW) group.

Salary Most were low paid with 46.9% of the workers getting below Birr 100.00/month, and only 8.3% getting above 150.00/month. More (FW) group were found within the low and higher salary ranges, whereas more (AI) group were found in the medium salary range. Mean salary for (AI) group was 106.49 and for (FW) group 116.11. The latter group had a significantly higher salary according to the results of a t-test performed on uncategorized salary data.

Table 1. Frequency Distribution on Demographic Information

Variables		Totals (n=196)	Agro-Ind. (n=95)	Farm (n=101)	X^2
Age	24-35 yrs	56(29.3%)	14(14.9%)	42(43.3%)	18.70
	36-45 "	96(50.3%)	56(59.6%)	40(41.2%)	***
	46-55 "	39(20.4%)	24(25.5%)	15(15.5%)	
Sex	Male	180(91.8%)	80(84.2%)	100(99.0%)	12.39
	Female	16(8.2%)	15(15.8%)	1(1.0%)	***
Marital	Married	185(94.4%)	86(90.5%)	99(98.0%)	3.87
	Widowed/ divorced	11(5.6%)	9(9.5%)	2(2.0%)	
Ethnicity	Amhara	36(18.4%)	21(22.1%)	15(14.9%)	13.97
	Oromo	17(8.7%)	7(7.4%)	10(9.9%)	***
	Kembata	35(17.9%)	8(8.4%)	27(26.7%)	
	Wolayta	88(44.9%)	50(52.6%)	38(37.6%)	
	Sidama	6(3.1%)	2(2.1%)	4(4.0%)	
	Other	14(7.1%)	7(7.4%)	7(6.9%)	
Religion	Christian	177(90.3%)	82(86.3%)	95(94.1%)	6.22
	Moslem	10(5.1%)	5(5.3%)	5(5.0%)	*
	Other	9(4.6%)	8(8.4%)	1(1.0%)	
Education	Illiterate	2(1.0%)	0(0.0%)	2(1.0%)	6.17
	Read&Write only	155(79.5%)	93(97.9%)	62(62.0%)	
	Grade 1-6	25(12.8%)	1(1.1%)	24(24.0%)	
	" 7-8	5(2.6%)	0(0.0%)	5(5.0%)	
	" 9-12	8(4.1%)	1(1.0%)	7(7.0%)	
Salary	51-100	92(47.7%)	37(38.9%)	55(56.1%)	10.9
	101-150	85(44.0%)	53(58.8%)	32(32.7%)	*
	151-449	16(8.3%)	5(5.3%)	11(11.2%)	

* $p < .05$ *** $p < .001$

2. Food Intake

a. 24-hour Recall

The main variables of interest here were the kinds of food eaten in a 24-hour period and the number of meals/snacks during which these foods were eaten. Only 13 respondents indicated that 1 or 2 members were absent for a meal on the previous day. In addition, 25 families (12.8%) had one or more guests (mostly 1 or 2 guests) on the previous day. The number of meals for which a type of food was eaten was classified as none, low (1-2 times) and adequate ($\geq$ 3 times) per day. The categories of foods eaten were: carbohydrates (cereals, tubers and stems), proteins (legumes, animals), fats, fruits, vegetables and beverages.

Findings from the 24-hour recall survey (table 2) show that most of the meals consist of carbohydrate-rich foods, followed by proteins particularly legumes. Fat consumption was minimal, only a few families ate more than 40 gm of oil per day. Of the whole sample, 11.3% ate less than three meals a day, 87.7% ate three meals or more a day. The vegetables consumed consisted of kale, potatoes and sweet potatoes; no fruit was consumed.

Although the data on energy intake reveal more precisely the quantity of food eaten, these data show how many meals consist of each type of food. Compared to the agro-industry worker families, farm worker families ate more meals consisting of proteins both of animal and plant origin; the number of meals at which vegetables were eaten was also higher for farm workers. Only beverage consumption was significantly higher in AI worker families.

Table 2. Frequency Distribution for Types of Food Eaten (24-hour Recall)

	Totals (n=196)	Agro-Ind (n=95)	Farm (n=101)
Carbohydrates			
None	0	0	0
1-2 meals	22(11.3%)	12(12.8%)	0(9.9%)
≥ 3 meals	173(88.7%)	82(87.2%)	91(90.1%)
Proteins			
None	50(25.5%)	27(28.8%)	23(22.8%)
1-2 meals	111(56.9%)	54(57.4%)	57(56.4%)
≥ 3 meals	33(16.9%)	12(12.8%)	21(20.8%)
Legumes			
None	51(26.2%)	28(29.8%)	23(22.8%)
1-2 meals	111(56.9%)	54(57.4%)	57(56.7%)
≥ 3 meals	33(16.9%)	12(12.8%)	21(20.8%)
Animal Protein			
None	184(94.4%)	91(96.8%)	93(92.1%)
1-2 meals	11(5.6%)	3(3.2%)	8(7.9%)
≥ 3 meals	0	0	0
Vegetables			
None	77(39.5%)	42(44.7%)	35(34.6%)
1-2 meals	100(51.3%)	46(49.0%)	54(53.5%)
≥ 3 meals	18(9.2%)	6(6.4%)	12(11.9%)
Beverages			
None	154(79.4%)	67(70.5%)	87(86.1%)
1-2 meals	36(18.6%)	24(25.5%)	12(12.0%)
≥ 3 meals	4(2.0%)	3(3.2%)	1(1.0%)

The staple food for 99.5% of the families was cereals mainly maize, the others ate Kotcho as a staple. Maize was eaten in all households, tef eaten by 80%, wheat by 31%, sorghum and barley by 8% each. Legumes mainly peas were eaten by (73.5%). Tubers and stems were eaten by less than 10% of the households.

b. Preparation and Serving of Food

The response to the question whether food was cooked separately for different members of the household, or the same for everyone revealed that children and adults ate the same food. The manner of serving was that 39% ate from one common plate and 61% from multiple common plates. No one ate from his/her own plate, which made individual food intake estimation impossible.

Comparison of agro-industry and farm worker groups shows that more farm worker families are served from one common plate, and more agro-industry worker families ate from multiple common plates.

c. Level and Adequacy of Food Intake

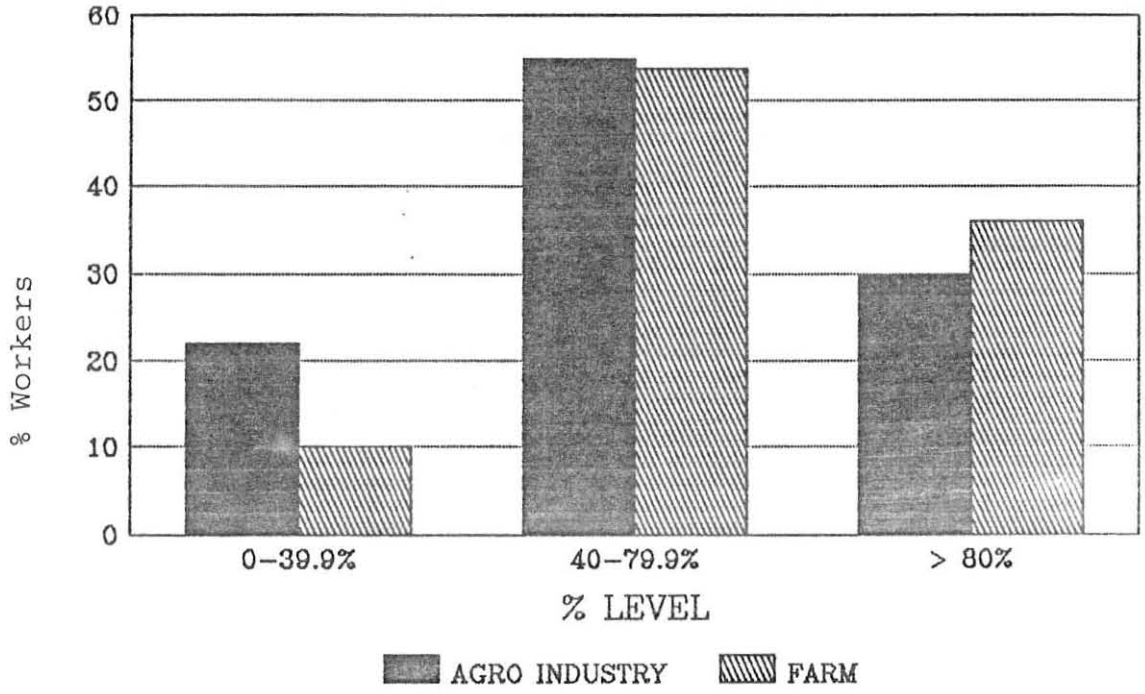
Family intake was classified as grossly deficient 0 - 39.9%, deficient 40 -79.9%, reasonably good $\geq$ 80% The mean level of intake was 69.24%, with a standard deviation of 35.71%. Only 29.8% of the total sample had a reasonably good level of intake. Of the two groups, agro-industry families were significantly worse off: 22% of them consumed less than 40% of their required calories. The odds of being severely undernourished were 3.37 times higher in the agro-industry worker families than in families of farm workers (see table 3 and figure 2).

Table 3. Frequency Distribution in terms of Level of Food Intake

Level	Totals (n=171)	Agro-Ind. (n=82)	Farm (n=89)	X^2	OR (95% CI)
low - 39.9%	27(15.8%)	18(22.0%)	9(10.1%)	6.13*	3.4(1.14,10.16)
40 - 79.9%	93(54.4%)	45(54.9%)	48(53.9%)		1.6(0.74, 3.37)
≥ 80%	51(29.8%)	19(23.1%)	32(36.0%)		

* $p < .05$

Fig.2 Adequacy of food intake



Carbohydrates (cereals, tubers and stems) constituted the majority of the energy supplied -- 82% for agro-industry and 83.3% for farm workers. Fats provided only a very small proportion -- 1.7% for (AI) and 2.6% for (FW) groups. Calories from proteins made up 10.7% the total for AI and 8.43% for FW groups. Animal protein constituted 1% for AI and 0.03% in the FW workers. Vegetables provided 5.8% and 6.0% of the calories for agro-industry and farm workers, respectively. Neither group ate fruits.

3. Family Characteristics Indicative of Nutritional Status

a. Socio-economic Variables These included education, salary, total income (salary plus other), and savings. Comparison between the groups (table 4) shows that there is a significant difference in the two with respects to education, salary, and total income. The odds of being less educated was 26 times higher in the agro-industry group; the odds of having a low total income was 2.86 times higher in the agro-industry group. A t-test was done on the salary difference. The mean salaries of agro-industry and farm workers were 106.49 and 116.11, respectively. There was no difference seen with respects to saving between the groups.

b. Sources of food Sources of food for 70.4% of the households were the open market and subsidised purchase from the enterprise. Production of food for consumption was minimal with only 10.2% growing vegetables. Animal ownership was observed in 94 families mostly in the farm villages. Agro-industry families relied more on subsidised food and farm families on both. Storage loss encountered from rats was 59.2% and from insects 12.2% in both

Table 4. Frequency Distribution for Socioeconomic Variables

Variables	Totals (n=196)	Agro-Ind. (n=95)	Farm (n=101)	OR (95% CI)
Education				
grade 0 - 6	157(80.5%)	93(97.9%)	64(64.0%)	26.20(5.80,163.1)
grade 7 - 12	38(19.5%)	2(2.1%)	36(36.0%)	
Salary				
51 - 100	92(47.7%)	37(38.9%)	55(56.1%)	ns
101 - 150	85(44.0%)	53(58.8%)	32(32.7%)	3.64(1.04, 13.4)
150 - 449	16(8.3%)	5(5.3%)	11(11.2%)	
Additional Income				
0 - 50	179(94.2%)	88(96.7%)	91(91.9%)	ns
50 - 100	11(4.2%)	2(2.2%)	6(6.1%)	ns
101 - 180	3(1.6%)	1(1.1%)	2(2.0%)	
Total Income				
51 - 150	167(87.0%)	88(92.6%)	79(81.4%)	2.86(1.06, 8.02)
151 - 450	25(13.0%)	7(7.4%)	18(18.6%)	
Savings				
0 - 25	166(84.7%)	70(73.7%)	96(95.0%)	ns
26 - 50	26(13.3%)	23(24.2%)	3(3.0%)	ns
51 - 85	4(2.0%)	2(2.1%)	2(2.0%)	

groups, though it was higher for agro-industry families. The odds of encountering loss from either rats or insects was 1.27 times higher in the agro-industry group.

c. Facilities Each facility variable (market accessibility, enough fuel for cooking, availability of a flour-mill, transport need) was scored as 0 (absent) and 1 (present). The scores were summed to form a composite that ranged from 0 - 4. Only 9 people obtained a score of 4, 33.2% of the families had 0 or 1 facility only, implying few labour saving devices for acquiring and preparing food (see table 5). The difference between agro-industry and farm workers was significant showing that farm workers were less likely than agro-industry workers to have facilities.

d. Family Constellation The number of people in each household ranged from 1 to 15 persons. The figure for under-fives per family was between 0 and 5 with the majority having 1 or 2 youngsters. T-tests conducted on the continuous number for family size and under-fives revealed that neither comparison was significant. The mean family size and under-fives was 7.56 and 1.62 for agro-industry and 6.98 and 1.85 for farm worker families.

e. Housing condition This was examined using a composite of 10 scores, each item receiving 1 point for a good and 0 for a bad condition. The highest score was 10 and the lowest 2. The scores were categorised into three levels: poor (2 - 4), moderate (5 - 7), and good (8 - 10).

Table 5. Frequency Distribution for Facilities

Type	Totals (n=196)	Agro-Ind. (n=95)	Farm (n=101)	X^2	OR (95% CI)
Market Accessibility					
Poor	76(38.8%)	0(0.0%)	76(75.2%)		.00(0.0, 0.03)
good	120(61.2%)	95(100.0%)	25(24.8%)		
Fuel Availability					
No	145(74.0%)	83(87.4%)	62(61.4%)	15.84***	4.35(2.00,9.62)
Yes	51(26.0%)	12(12.6%)	39(38.6%)		
Flour-mill					
Absent	62(31.6%)	0(0.0%)	62(61.4%)		.01(0.00, 0.05)
Present	134(68.4%)	95(100.0%)	39(38.6%)		
Transportation need					
Yes	110(56.1%)	37(38.9%)	73(72.3%)	20.75***	0.24(0.13,0.46)
No	86(43.9%)	58(61.1%)	28(27.7%)		
Composite Facilities					
Few	65(33.2%)	0(0.0%)	65(64.4%)		.001(0.00, 0.04)
Adequate	131(66.8%)	95(100.0%)	36(35.6%)		

Note. Frequency of 0 replaced by 1 to calculate odds ratios.

*** $p < .001$

Although most people lived in moderate and good housing conditions, 23.7% lived in poor conditions especially farm workers. Agro-industry workers were more likely than farm workers to live in relatively good conditions. Odds ratios showed significant differences between the two groups in ownership, lighting, water supply, waste and garbage disposal, and composite housing variable.

f. Food Avoidance and Taboos Families were asked if any members of the household (categorized by age, sex, special circumstances - pregnancy and lactation), were prevented from eating certain foods and for what reasons. Of the whole sample, 57% reported avoidance. Table 7 shows foods avoided and by whom; table 8 the reasons for the avoidance. One can see from these, that the vulnerable groups of child-bearing women and children were expected to avoid certain foods. The foods avoided are from the more nutritious groups. The greatest consensus about food taboos was found for pregnant women where 33% of the respondents said that they should avoid milk and its products, and 23% should avoid fruits and vegetables. There was no avoidance reported for adolescent boys, adult men or sick persons. The reasons for the avoidance for all types of food included: "not good" (23%), causes abdominal cramps, discomfort, and soreness (23.4%), sticks on the foetus' skin (42.3%). However, none of the respondents believed that any food brought about serious bodily harm.

Within each family the total number of people who were expected to avoid certain foods produced a mean of 1.10 for agro-industry families and 1.40 for farm worker families (t-test ns).

Table 6. Frequency Distribution for Housing and its Environment

Housing Variables	Total (n=196)	Agro-Ind. (n=95)	Farm (n=101)	X^2	OR (95% CI)
Ownership					
Rented/provided	147(75.0%)	46(48.4%)	101(100.0%)	66.7	.01(0.00, 0.07)
Own	49(25.0%)	49(51.6%)	0(0.0%)	***	
Roof					
Thatched	2(1.0%)	2(2.1%)	0(0.0%)	ns	
Tin	194(99.0%)	93(97.9%)	101(100.0%)		
Floor					
Earth	185(94.9%)	86(91.5%)	99(98.0%)	ns	
Concrete	10(5.1%)	8(8.5%)	2(2.0%)		
Wall					
Mud	196(100.0%)	95(100.0%)	101(100.0%)		
Mud & Sand	0	0	0		
Partitioned					
No	59(30.4%)	27(28.7%)	32(32.0%)	ns	
Yes	136(69.6%)	68(72.3%)	68(68.0%)		
Windows					
Not available	23(11.8%)	11(11.6%)	12(12.0%)	ns	
Available	172(88.2%)	84(88.4%)	88(88.0%)		
Lighting					
Kerosene Lamp	63(32.1%)	8(8.4%)	55(54.5%)	45.47	.08(0.03,0.19)
Electricity	133(67.9%)	87(91.6%)	46(45.5%)	***	
Water Supply					
Unsafe	64(32.7%)	0(0.0%)	64(63.4%)	85.52	.01(0.00,0.04)
Safe	132(67.3%)	95(100.0%)	37(36.6%)	***	
Waste Disposal					
Improper	79(40.3%)	17(17.9%)	62(61.4%)	36.69	.14 (0.07,0.28)
Proper	117(59.7%)	78(82.1%)	39(38.6%)	***	
Garbage Disposal					
Improper	116(59.2%)	45(47.4%)	71(70.3%)	9.72	.38(0.20,0.71)
Proper	80(40.8%)	50(52.6%)	30(29.7%)	*	
Composite Score					
Poor (2-4)	46(23.7%)	3(3.2%)	43(43.4%)	72.96	.00(0.0, 0.03)
Moderate (5-7)	99(51.0%)	46(48.4%)	53(53.5%)	***	.06(0.01,0.21)
Good (8-10)	49(25.3%)	46(48.4%)	3(3.0%)		

Note: Frequency of 0 replaced by 1 to calculate odds ratios.
* $p < .05$ *** $p < .001$

Table 7. Number of Respondents Stating Taboos

Foods	Categories of people			
	Infants & Children	Adolescent Girls	Pregnant Women	Lactating Mothers
Fruits & Vegetables	11	1	44	28
Meat	-	1	28	1
Milk & its Products	1	-	51	1
Cereals, Pulses and their products	8	1	15	30
Spices	2	13	2	3

Note. Excludes 3 pregnant women who were to avoid sugarcane, 2 who stated that infants should avoid honey.

Table 8. Reasons for Avoidance and their Frequencies

	Foods				
Reasons	Fruits and Vegetables	Meat	Milk & Products	Cereals/Pulses & products	Spices
No definite reason ("Not good")	22	4	7	17	1
Fattening to baby/mother	5	4	2	-	-
Brings about early menses	-	-	-	-	14
Abd. cramps, discomfort and soreness	23	1	1	24	3
Sticks on foetus' skin	24	20	45	5	-

Nutrition Education Information on the housewife's knowledge of nutrition was gathered and showed that housewives in the agro-industry families were more likely to have had nutrition education than housewives in the farm families (35.58% vs 13.9%).

4. Factors Associated With Level of Food Intake

Cross-tabulation of the variables (salary, education, family size, number of under-fives, housing condition, facilities, availability of vegetable garden and domestic animals, nutrition education) was done with the three levels of caloric intake, for the two groups combined, and for each group separately. For the two groups combined, family size was significant, higher family size being associated with a lower level of energy intake. This same relationship was also seen in the agro-industry group. However, for the farm group, none of the variables were relevant. For both groups combined, the odds of being grossly deficient was 4.5 times higher in medium size families (6 - 10), than those in small size families (1 - 5); and the odds of being deficient was 3.3 times higher again in families of (6 - 10) than in those of (1 - 5). For agro-industry group, the odds being deficient was 5 times higher in medium size families than in small size families. None of the other ratios were significant.

Mean salary for agro-industry group was Birr 106.5 and for farm group 116.1/month. The latter group had a significantly higher salary according to the results of a t-test performed on uncategorized data. Analysis of variance was performed to examine the relation between adequacy of food intake, occupational group,

salary and family size. Salary and family size were combined to form a new variable called per capita salary which is the employee's salary divided by the family size. Frequencies were worked out and based on this, three categories of per capita salary were formed: 0 to 12.99 Birr/month, 13 to 17.99 Birr/month, 18 Birr and above; and a 2 X 3 (occupation X per capita salary) analysis of variance was done. There were main effects for occupational groups, $\underline{F}$ (1,162) = 7.7, and for per capita salary, $\underline{F}$ (2,162) = 6.4, $\underline{p}$ <.01. The interaction was significant at the .07 level. The means are graphed in figure 3. Increasing per capita salary did not benefit agro-industry families until it reached 18 Birr and above per person; whereas farm workers showed an increase in intake at the middle per capita level. The biggest discrepancy between agro-industry and farm workers was found at the middle per capita level, where farm families were consuming on average 80% of their requirements whereas agro-industry families were consuming on average 51% of their requirements.

The relationship between food taboos and caloric intake was examined with Pearson Product Correlations between the level of intake and the number of people expected to avoid foods. This correlation was not significant ($\underline{r}$ = -.04).

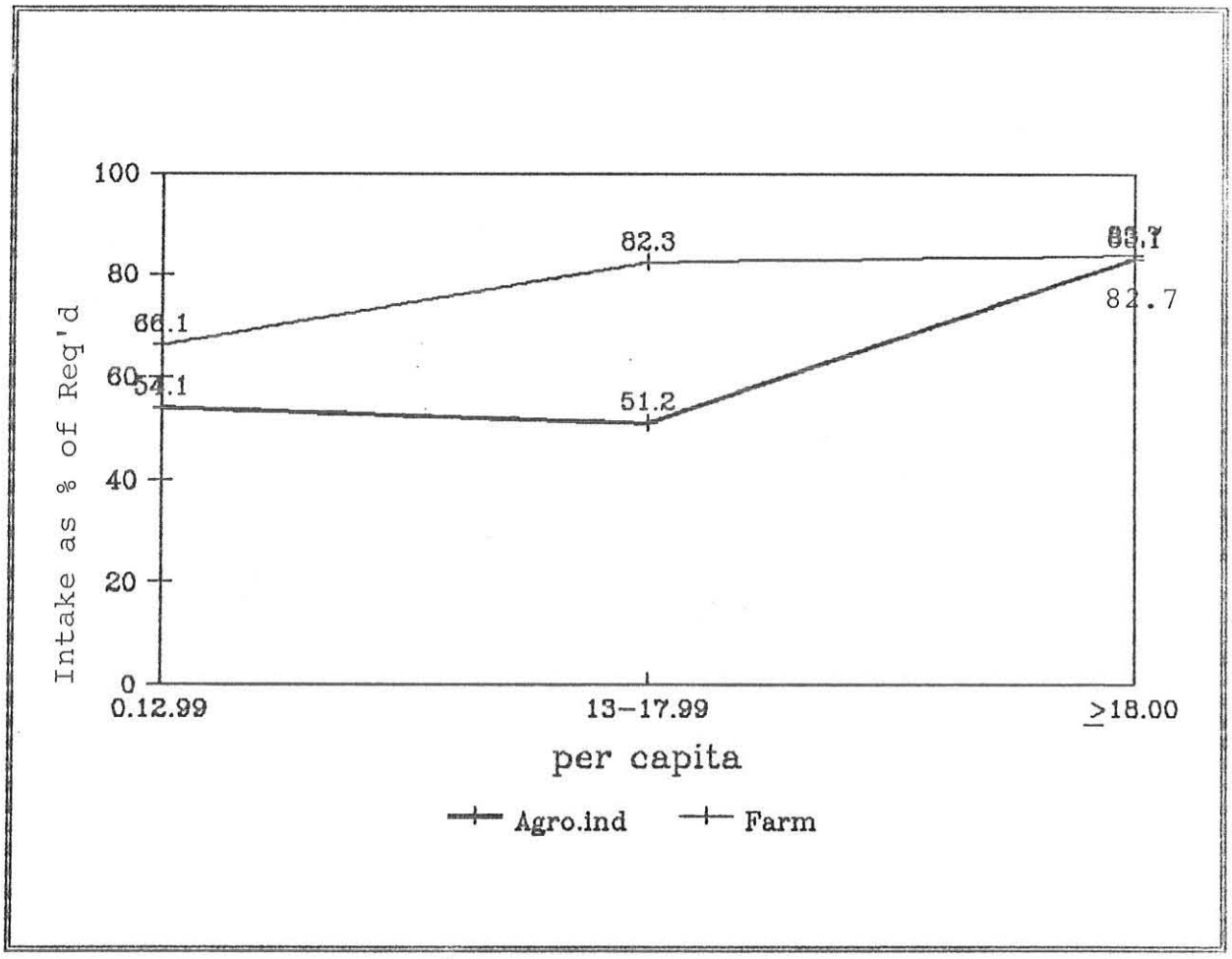


Fig.3 Mean level of intake at three per capita salary for the two occupational groups.

DISCUSSION

The major finding of this study was the presence of widespread undernutrition on the Sidamo State Farm. Of the whole sample, 70% consumed less than 80% of their required daily calories on the day the interview was conducted, and 16% consumed less than 40% of their requirements. If this was a typical day, these workers and their families were eating much less than they needed to maintain growth, health, and expected activity levels.

The very high rate of undernutrition (70%) suggests that the workers and their families are not getting enough energy to function at even a moderate activity level. As is usual during the peak agricultural season, employees have much physical work to perform. A study done in Gojam (39) showed more physical work to be done often up to 17 hours a day for men, 14 hours for women and 12 hours for children. It is also at this season that food supplies are at their lowest because supplies from the last harvest have been finished. Because the study was conducted only during this season, it presents the workers' level of nutrition at its yearly lowest. This may be one of the reasons why the level of undernutrition is so much higher than the 30% reported in other studies (2,4). The impact of seasonal variations on the levels of food intake for households have been reported by many researchers, such as Selinus et al. (20), Abdulla et al.(23). In Ethiopia, high levels of intake are associated with the season of plenty (December

- February), and low levels with the season of scarcity (July - September). If the study were to be conducted again during the months of December to February, food consumption would hopefully be much higher. Also, discrepancies between this and other studies could be due to the index of undernutrition used. The studies reporting figures of 30% or under used anthropometric measures of under-five children rather than food consumption of the whole family. Food consumption would have to be low for an extended period in order to register as low weight for age. Thus low food consumption may be seen as an early warning for subsequent health problems if it persists. Also nutritional status of under-fives may be heightened by the practice of breast-feeding children.

The second major finding was that the agro-industry families had a lower level of caloric intake than the farm worker families. Comparison of the two occupational groups revealed that farm workers fared better in education, salary, reliance on several sources of food, in encountering less food loss during storage. Agro-industry workers on the other hand had higher scores in facilities, nutrition education, and housing. From the six sets of determinant variables (money, sources of food, facilities, family constellation, housing, food related practices), only family size in the two groups combined, as well as in the agro-industry group were significantly associated with level of food intake.

Mean salary for the workers was 111.30 -- 106.49 for agro-industry, and 116.11 for farm groups. One of the reasons for this low pay is the enterprise's inability to make profits. The

enterprise in fact operates at a loss due to a multitude of causes which include(15):

a. Low yield due to low and uneven distribution of rain, limited budgets, obsolete machinery & implements, lack of spare parts, ill-equipped maintenance unit, shortage of skilled manpower in many areas, and excess of unskilled workers, inadequate infrastructure and facilities, poor social services to its workers especially for those on farms located far from towns.

b. The sale of farm produce to Agricultural Products Marketing Corporation (APMC) at a fixed price and which is below production costs.

c. Delayed cash payments for the goods sold making it impossible for the enterprise to make loan repayments on time, thus interest builds up.

d. Incompetent systems of collection of the crops sold to APMC which results in food deterioration at a considerable loss to the enterprise.

Many researchers Bryceson (2), Huntsman (25) have shown that misallocation even more than income influences the occurrence of undernourishment. In this study low income with large family seemed to explain the overall undernutrition and also the difference between the two occupational groups. The largest difference between the two groups was found at moderate per capita salary. Farm families in this salary range ate much better than agro-industry families in the same range. This could be because by virtue of their location, that is, being far removed from city

facilities, farm workers do not spend their money on many things other than food. Agro-industry workers in contrast can spend money on recreation and drinking that tempt men to misuse their income, bills like electricity and water, transportation fare, and house rent. Because there are no schools on farms, families are spared school fees and stationary expenses; this fact, by no means positive, nevertheless saves money. Though there are no supportive data, farm workers are more likely to hand their money over to their wives to be spent on food than are agro-industry workers. The agro-industry group have to meet all those expenses which compounds the already lower salary. This could be one of the reasons why even when per capita salary was at moderate level, the level of intake for agro-industry group did not increase as much as it did for the farm group. In addition, foods can be purchased at a relatively cheaper price on the farms.

This explanation does not fit in very well with that of Bryceson (2) in which she identifies several built-in safeguards for averting risk in African rural communities. These include multiple intercropping to maximize yield, hunting and gathering during famine which in some parts is an integral part of the regular dietary consumption. The farm families in this study do not have any of these options available to them. They live in a region devoid of all wild plants or animals, because it has been cleared for agriculture; they produce for the state and have no control over any aspect of production. Some do however have vegetable gardens and domestic animals though not enough to meet

all their needs. The agro-industry families live in town and do little farming.

Family size is an important denominator which determines availability of food for members of a household. Per capita salary was found to be higher in the farm group, primarily because mean salary was higher, but also because the number of people in each household was less. Growth in population unaccompanied by a fast economic development is an undisputed cause of malnutrition, reported in numerous documents presented by sociologists, medical professionals, food scientists, in addition to nutritionists. The results of this study only emphasizes a finding that has long been acknowledged. Agro-industry group enjoy better access to health care including family planning but their family size is higher. A couple of factors may have interacted to produce this contradictory phenomenon. Firstly, agro-industry workers are older than farm workers and thus had a longer period for reproduction, and their family size may have reached the maximum, whereas the farm worker's is still expanding. Secondly, the poorer housing and environmental condition of farm worker's families could have caused more deaths. Health problems arising from lack of clean water supply, poor housing, and environmental hygiene like diarrhoeal diseases though preventable prevail in the farm workers community. The reasons why the necessary preventive work has not been carried out in Sidamo Agricultural Development Enterprise are the shortage of appropriately trained manpower, the misplacement of priorities, more emphasis given to production, and lack of required financial

and material resources.

Nutrition education is higher in the agro-industry group, but still they suffer from lower level of intake because they are paid less, which supports Bryceson's statement that nutrition knowledge can not be interpreted into useful practice without economic capability.

There were some limitations of the study. The general limitation was in specifying calories needed. Activity level was set at moderate for all, Dejene Aredo says it varies between men, women and children and different occupations (39). It is likely that activity level of these employees would be more than moderate, which means the calories needed may have been underestimated. It may also vary between agro-industry and farm workers. The questionnaire omitted a question on pregnancy, and hence the extra requirement for pregnant women was not considered. This means that the total calories needed would have been more than was assigned, in which case the adequacy of intake was slightly overestimated.

The assumption that food intake is related to anthropometric measures was not tested, even though there is good reason to assume this. Reliance on food intake alone to determine nutrition status excludes the element of utilization by the body.

The consumption from a family common plate hinders the determination of individual intakes to see whether food is distributed disfavouring child-bearing women and children.

CONCLUSIONS AND RECOMMENDATIONS

The conclusions drawn from the findings of this research were:

1. There is a prevalence of undernutrition in Sidamo Agricultural Development Enterprise with a significantly lower level in the agro-industry group. This lower level was present despite the fact that the agro-industry families enjoyed better facilities and housing conditions. The important difference between the two groups was in terms of salary, with the agro-industry workers having lower salary.

2. In addition to occupation, the salary level per family member determined the adequacy of energy intake, with higher per capita salary being associated with higher energy intake.

3. The types of food eaten were similar for the occupational groups, though the sources differed slightly. The farm families obtained some food from the open market and home production, whereas agro-industry families relied more on subsidized purchase from the enterprise. The similarity in types of food eaten was seen in all three measurement techniques, namely 24-hour recall, weighing of food items, and questions on food eaten generally.

4. With direct observation (i.e. weighing), 70% were found to be consuming less than 80% of their energy requirements. In the agro-industry group, 22% were grossly undernourished, in comparison to 10% of farm worker families. Given that 89% of the families are eating 3 meals a day, one must infer that the quantities eaten at each meal are inadequate.

5. The foods consumed were mainly cereals, along with some legumes and vegetables. No fruits were eaten.

6. Food taboos were reported in 57% of the sample, affecting especially children and women during pregnancy and lactation. This means that even when food is available, consumption is not assured for all family members.

These conclusions lead to the formulation of the following recommendations.

1. Raising the quantity of rationed grain to workers would significantly improve the food intake for families, without the enterprise incurring too high a cost. The little storage cost that would be incurred, ie. for space and/or insecticide could be made up for by, the increased productivity that would result from improved nutrition of workers.
2. Promotion of vegetable gardening and small animal rearing should be treated with more zeal. Families should be encouraged to engage themselves in the above activities, both to generate income and improve food consumption. Capital could be obtained from the Workers' Association funds.
3. Poor market accessibility has been reported as one cause of inability to obtain the necessary food items for families on farms. This therefore must be improved by providing transport more frequently than once a month to the nearest town. Communal shops on the farm sites must be improved so that people are able to buy most of what they need at

reasonable prices.

4. Nutrition education must be conducted to make the community aware of the ill-effects of food avoidance and taboos, and the vulnerability of certain groups, such that food availability results in food consumption. Nutrition education should address the importance of preparing nutritious foods for the vulnerable groups (children, pregnant and lactating women), serving them on separate plates so that they get the amount and quality of food they deserve.

In addition, two general recommendations which have also been found to be relevant in this study have been put forward.

1. The employers' view may be that pay increases to workers can only be instituted if and when the enterprise exercises control over what it produces and becomes a profit making organization. But it is vital to note that workers need incentives to be more productive and this increased productivity will lead to profit. Thus employers should seriously consider increasing workers' salaries.
2. Family planning is a health service that should be introduced and promoted along with other primary health care services. Health manpower shortage has been the main obstacle for poor performance thus far. Therefore, the link with the Ministry of Health must be strengthened such that the enterprise would be able to effectively exploit resources that do exist in the Awraja.

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APPENDIX A

Questionnaire on Food Availability and Consumption Pattern

I. Demography.

1. Name of Worker _____ Age _____ Sex ____

2. Address: Farm _____ Unit No. _____

House No. _____
Or
Keftegna _____ Kebele _____ House No. _____

3. Marital Status:
____ Married 1
____ Single 2
____ Widowed 3
____ Separated 4

4. Occupation:
____ Agro-Industry 1
____ Farm Machinery 2
____ Farm Labourer 3
____ Miscellaneous 4

5. Ethnicity:
____ Amhara 1
____ Oromo 2
____ Kembata/Hdya 3
____ Wolaita 4
____ Sidama 5
____ Other 6

6. Religion:
____ Christian 1
____ Moslem 2
____ Other 3

7. Salary in Birr:
____ 51 - 100 1
____ 101 - 150 2
____ 151 - 450 3

8. Education level:
____ Illiterate 1
____ Barely read & write 2
____ Grade 1 - 6 3
____ " 7 - 8 4
____ " 9 - 12 5
____ " above 12 6

II. Family Size:

9.

No.	Name of house hold Member	Relationship to head	Age	Sex	Income
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

10. No. of under-fives: _____

III. Housing and its Condition (Economic Status)

11. Ownership: ____ Provided 1
____ Rented 2
____ Own 3

12. Material for the roof is:
    ____ Thatch 1
    ____ Tin 2
    ____ Other 3

13. The floor is: ____ Earth 1
    ____ Bamboo 2
    ____ Concrete 3

14. The wall structure is of:
    ____ Mud 1
    ____ Mud & Sand 2
    ____ Blocks 3
    ____ Bricks 4

15. Are the rooms partitioned for cooking, sleeping and living?
    ____ Yes 1
    ____ No 0

16. Are windows available:
    ____ Yes 1
    ____ No 0

17. What is the lighting like ?
    ____ Electricity 4
    ____ Candle 3
    ____ Kerosene lamp 2
    ____ Wood 1

18. What is the source of water ?
    ____ Piped 4
    ____ Dug-well and piped 3
    ____ Dug-Well(Protected) 2
    ____ Brought in tankers 1

19. What is the facility for waste disposal ?
    ____ Flushed toilet 3
    ____ Pit latrine 2
    ____ Open Field 1

20. How is garbage disposed ?
    ____ Pits 2
    ____ In the open 1

IV. Sources and Types of Food

21. What is your staple food ?
    ____ Cereals 1
    ____ Tubers and stems 2
    ____ Cereals, tubers and stems 3
    ____ Animal Products 4

22. Where does your food usually come from ?

____ Rationed 1
____ Bought 2
____ Rationed and bought 3
____ Home produced 4

23. Do you grow vegetables around the house ?

____ Yes 1
____ No 0

24. Do you sell any of your home produced vegetables

____ Yes 0
____ No 1

25. Do you own Animals ?

____ Yes 1
____ No 0

V. Level of Income and Purchasing Power

26. Amount of total income:

____ 51 - 150 1
____ 151 - 250 2
____ 251 - 350 3
____ 351 - 450 4

27. Expenses other than food each month in Birr: (House rent/bank loan, electricity, water, fuel wood, gas, associations, edir, ...etc.)

____ 5 - 45 1
____ 46 - 85 2
____ 86 - 120 3

28. Savings each month, (ekub, bank deposit etc...) in Birr

____ 0 - 25 1
____ 26 - 50 2
____ 51 - 85 3

VI. Facilities

29. How Accessible is the Market ?

____ There is no market in the locality 0
____ > 2 Hours waking distance 1
____ 1 - 2 Hours " " 2
____ 30 - 60 Minutes " 3
____ 15 - 30 Minutes " 4
____ < 15 Minutes " 5

30. Do you get fuel-wood as much as you require

____ Yes 1
____ No 0

31. Do you need transport for shopping and other activities?
____ Yes 0
____ No 1

VII. Storage and Processing

32. Do you have a flour-mill nearby ?
____ Yes 1
____ No 0

33. Do you encounter food loss from insects ?
____ Yes 0
____ No 1

34. Do you encounter food loss from rats ?
____ Yes 0
____ No 1

VIII. Preparation and Service of Foods.

35. With regards to type of food, how is food prepared for family members ?
____ Same type for all members 0
____ Different for different members 1

36. Do members of the household eat from ?
____ One common plate 0
____ Multiple common plate 1
____ Individual plates 2

37. In which order is food served to members of household ?
____ Man wife, then children 1
____ Man then Wife and Children 2
____ Man and wife then children 3
____ All adults then children 4
____ No defined order 5
____ Children then adults 6

IX. Knowledge on Nutrition

38. Have you ever had any education nutrition ?
____ Yes 1
____ No 2

X. Food Avoidance and Taboos

39. Which foods and drinks may not be consumed by the following people and why ?

- Children 0 - 5 years
  Foods _____
  Reasons _____
  _____

- Children > 5 yrs.
  Foods _____
  Reasons _____
  _____

- Adolescent girls
  Foods _____
  Reasons _____
  _____

- Adolescent boys
  Foods _____
  Reasons _____

- Pregnant women
  Foods _____
  Reasons _____
  _____

- Lactating mothers
  Foods _____
  Reasons _____
  _____

- Men
  Foods _____
  Reasons _____
  _____

- Women
  Foods _____
  Reasons _____
  _____

- Sick persons
  Foods _____
  Reasons _____
  _____

40. Are there foods you think are harmful ?

____ Yes 0
____ No 1

41. If yes what foods ? _____

_____

XI. 24 Hours Recall

What kind of food did you eat yesterday ?

Fill out the form on the following page one column for each household. Fill out one column for each household member wherever different foods have been cooked for different members of the family.

Ask the question, what did you eat yesterday ?

And on this page ask the following questions.

a. Did any of the household members stay away for a meal yesterday ?

b. If yes, How many ?

____ One
____ Two
____ Three
____ > Three

No. of Adults _____
No. of Children _____

c. Did you have guests for a meal yesterday ?

d. If yes, how many ?

____ One
____ Two
____ Three
____ > Three

No. of Adults _____
No. of Children _____

What foods did you eat yesterday ?

Key = B - Breakfast
L - Lunch
D - Dinner

Name of person Interview									
Kinds of food	B	L	D	B	L	D	B	L	D
Cereals & Legumes									
Enjera									
Bread									
Kita									
Kolo									
Nifro									
Genfo									
Animal foods									
Meat									
Fish									
Milk									
Cheese									
Eggs									
Roots & Tubers									
Kotcho or Bula									
Potatoes									
Sugarcane									
Others									
Wot									
Alicha									
Vegetables									
Tea or Coffee									
Tela									

XII. Direct Assessment of Food Intake

42. Weight in gm. of food items intended to be consumed for the day; and their energy supply.

No.	Food Item	Wt.in gms.	Cal/m	Cal/food Item
1	Maize on cob			
2	Maize flour			
3	Wheat flour			
4	'Tef' flour			
5	'Enjera' (corn)			
6	'Enjera' tef			
7	Engera (tef & corn			
8	Bread (Wheat Corn)			
9	'Kita'			
10	'Ambasha'			
11	'Kotcho' fermented			
12	'Kotcho' baked			
13	Misir kikk wot			
14	Yater Kikk Wot			
15	Shiro wot			
16	Meat wot			
17	potato wot			
18	Oil			
19	Butter			
20	Berbere			
21	Potatoes (raw)			

No.	Food item	Wt.in gm.	Cal/gm	Col/food item
22	Yater shiro			
23	Yater kikk			
24	Misir kikk			
25	Onion			
26	Chili			
27	Kale (raw)			
28	Maize 'Nefro'			
29	Broad bean seed			
30	Broad bean 'Nefr '			
31	Adenguare			
32	Yam			
33	Milk			
34	Cheese			
35				
36				
37				
38				
39				
40				

Total calories available =

Name of Interviewer _____

Signature _____

APPENDIX B

Recommended Daily Intake of Nutrients

Age	Energy	Protein	Vit.A	Vit.D	Vit B1	Vit.B2	Vit.pp	Folic acid	Vit.C	Calcium	Iron
	Cal.	gms.	m.gms.	Mic.gms.	m.gms.	m.gms.	m.gms.	mic.gms.	m.gms.	gms.	m.gms.
Children											
< 1	820	14	300	10.0	0.3	0.5	5.4	60	20	0.6	5-10
1-3	1360	16	250	10.0	0.5	0.8	9.0	100	20	0.5	5-10
4-6	1830	20	300	10.0	0.7	1.1	12.1	100	20	0.5	5-10
7-9	2190	25	400	2.5	0.9	1.3	14.5	100	20	0.5	5-10
Male adolescents											
10-12	2600	30	575	2.5	1.0	1.6	17.2	100	20	0.7	5-10
13-15	2900	37	725	2.5	1.2	1.7	19.1	200	30	0.8	9-18
16-19	3070	38	750	2.5	1.2	1.8	20.3	200	30	0.6	5-9
Female adolescents											
10-12	2350	29	575	2.5	0.9	1.4	15.5	100	20	0.7	5-10
13-15	2490	31	725	2.5	1.0	1.5	16.4	200	30	0.7	12-24
16-19	2310	30	750	2.5	0.9	1.4	15.2	200	30	0.6	14-28
Adult man (moderately active)	3000	37	750	2.5	1.2	1.8	19.8	200	30	0.5	5-9
Adult woman (moderately active)	2200	29	750	2.5	0.9	1.3	14.5	200	30	0.5	14-28
Pregnancy	+350	38	750	10.0	+0.1	0.2	+2.3	400	50	1.1	14-28
Lactation	+550	46	1200	10.0	+0.2	0.4	+3.7	300	50	1.1	14-28

From the Hand Book on Human Nutritional Requirements WHO, Geneva, 1974.

APPENDIX C

Caloric Requirement Estimation by Age, Sex, and Special Circumstances

Head of	Caloric Requirement per Person in each Family													
Household	Children				Male adolescents			Female adolescents			Adult	Adult	Lactating	TOTAL
(code)	< 1	1-3	4-6	7-9	10-12	13-15	16-19	10-12	13-15	16-19	male	female		family
20		1360(2)	1830(2)	2190	2600(2)	2900	3070	2350		2310(2)	3000	2200(2)		34,110
40			1830(2)	2190		2900	3070(2)	2350(2)			3000(2)	2200		21,650
60				2190(2)				2350	2490(3)	2310	3000	2200		27,850
80		1360		2190(2)	2600				2490		3000	2200(2)		18,230
100				2190(2)		2900					3000	2200		14,230
120		1360(3)	1830(2)	2190(2)	2600			2350			3000	2200	+550	18,640
140		1360(2)									3000	2200		8,470
160		1360(2)	1830(2)	2190(2)	2600		3070				3000	2200	+550	19,990
180		1360	1830	2190(2)	2600	2900			2490		3000	2200		21,310
196		1360	1830(2)								3000	2200		10,770

Note: Figures in parentheses indicate the number of people in each category.

APPENDIX D

Recruitment and Training of Interviewers

Five interviewers speaking the different languages spoken by the workers families, ie. Wolayta, Sidama Kembata/Hadya, Oromo and Amharic, were selected. In addition, the candidates were all, female, with 12th grade education, residents of Awassa town, and twenty years old and above.

The training which consisted of both theoretical and practical parts, was conducted for a week just before the survey started. The theoretical training took the form of lectures and discussions interspaced with written and some oral examinations on:

a. General introduction to the project
b. Communicating with people
   - Greet the family in a way that is traditional for that household
   - Address with respect
   - Try and fit in (identify oneself) with that particular community
   - Speak in their own languages
   - Ask for their cooperation in answering the questions on the questionnaire after dully explaining the purpose of the exercise
   - Speak clearly and plainly, in a voice that is easily audible but not loudly
   - Do not take too much of their time, but still stay long enough to do the job will
c. Explanation of the survey to families
   - Who the visitor is and the purpose of the visit
   - What exactly is wanted of the family
   - The value of accurate information to the
   - Insurance of confidentiality
d. Personality expected of the interviewers
   - Should be confident and decisive but no aggressive
   - Friendly but firm
   - Have respect for other people
   - Must be dressed as is common to most people
   - Avoid talking about interviews where they may be over heard
   - Show no sign of approval/ disapproval of the things they see or hear
   - Should not give advice about diet, or give food or money to families, during the survey, nor should the accept food from them.

Demonstration was done using people not in the actual study followed by group discussions of techniques which also served to pre-test the questionnaire.

APPENDIX E

Glossary of Vernacular Terms

Edir	A social gathering that has a joint fund component, money uedin emergencies.
Ekub	Money saving device similar to a build-up share in modern banksEnjera A fluffy honey-comb structured flat bread made from tef.
Tef	Eragrostis abissinica; a type of cereal grain grown for Food purposes only in Ethiopia.
Kita	Unleavened bread.
Kolo	Roasted grain.
Nefro	Boiled grain.
Genfo	Porridge.
Kotcho /bula	A carbohydrate-rich food obtained from the stem and corm of a false banana plant.
Wot	Stew
Alicha	Stew without chili powder.
Tela	Local alcoholic beverage similar to beer.
Ambasha	A special type of bread.
Shiro wot	Roasted and ground pea stew.
Berbere	Chili powder.
Shiro	Roasted and ground pulses.
Yater kikk	Split peas.
Misir kikk	Split Lentil.

የምግብ አቀርቦትና አበላለሰ ዘይቤ መጠይቅ

ቀን _____

I. የሠራተኛው ጠቅላላ ሁኔታ

1. የሠራተኛው ስም _____ ዕድሜ _____ ፀታ_____

2. አድራሻ = አርሻ _____ መንደር _____ የቤት ቁ._____

<u>ወይም</u>

ከፍተኛ _____ ቀበሌ _____ የቤት ቁ._____

3. የጋብቻ ሁኔታ _____ ያገባ 1

_____ ያላገባ 2

_____ በሞት የተለየ 3

_____ የተለያየ 4

4. የሥራ ዓይነት _____ አገር አቋራጭ 1

_____ የአርሻ መሣሪያ ያምጥ 2

_____ የአርሻ ወዘአደር 3

_____ ልዩ ልዩ 4

5. ዘር _____ አማራ 1

_____ ኦሮሞ 2

_____ ካምባታ/ ሃድያ 3

_____ ወላይታ 4

_____ ሲዳማ 5

_____ ሌላ 6

6. ሃይማኖት _____ ክርስተያን 1

_____ አስላም 2

_____ ሌላ 3

7. ደሞዝ በብር _____ 51 – 100 1

101 – 150 2

151 – 450 3

8. የትምህርት ደረጃ _____ መሃይም 1

_____ ማንበብና መጻፍ 2

_____ ከ1 እስከ 6ኛ ክፍል 3

_____ ከ7ኛ እስከ 8ኛ ክፍል 4

_____ ከ9ኛ እስከ 12ኛ ክፍል 5

_____ ከ12ኛ ክፍል በላይ 6

II. የቤተሰብ አባላት ብዛት

9.

ቁ.	የቤተሰብ አባል ስም	ለሠራተኛው ዝምድና	ዕድሜ	ፀታ	ገቢ
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

10. እድሜአቸው ከ5 ዓመት በታች የሆነ ህፃናት ቁጥር _____

III. የመኖሪያ ቤትና ደረሻው

11. ቢለንብረት ነት _____ የመንግሥት 1
_____ ኪራይ 2
_____ የግል 3

12. የጣሪያው ክዳን ዓይነት _____ ሣር 1
_____ ቀርቀር 2
_____ ሌላ 3

13. የወለሉ አወራር _____ አፈር 1
_____ ሲጠራ 2
_____ ሊሽ/ሲሚንቶ 3

14. የግድግዳው አወራር _____ ጥያ 1
_____ አሸዋ ግርፍ 2
_____ ብሎኬት 3
_____ ጡብ 4

15. የመኝታ የግብስያና የእንግዳ ቤት የተከፋፈለ ነው?
_____ አያ 1
_____ አይደለም 0

16. ቤቱ መስኮት አለው?
_____ አያ 1
_____ የለም 0

17. መብራቱ ምንድነው?
_____ ኤሌክትሪክ 4
_____ ሻማ 3
_____ ኩራዝ 2
_____ እንጨት 1

18. ቤሀ የሚገኘው ከየት ነው?

_____ ቧንቧ 4

_____ ጉድጓድ 3

_____ ምንጭ 2

_____ ቦቴ/በርሜል 1

19. የመነሳሻው ዓይነት ምንድነው?

_____ ቤሀ የሚለቀቅበት ዘመናዊ ሽንት ቤት 3

_____ ደረቅ ጉድጓድ 2

_____ ሜዳ ላይ 1

20. ቀሻሻ የሚደፋው የት ነው?

_____ ጉድጓድ ቤሰጥ 2

_____ ሜዳ ላይ 1

IV. የምገብ ዓይነቶችና ምንጫቸው?

21. አዘውትራችሁ የምትመገቡት ምንድነው?

_____ ጤፍ፣ በቆሎ፣ ስንዴ ..... ወዘተ 1

_____ መረት ሥር በቀል = /እንሰት ድንች ... ወዘተ/ 2

_____ ጤፍ፣ በቆሎ፣ ስንዴ ... ወዘተ እንዲሁም
መረት ሥር በቀሎችን 3

_____ ከከብት የሚገኙ የምገብ ውጤቶች 4

22. አብዛኛውን ጊዜ የምገብ አህል የሚገኘው ከየት ነው?

_____ ከመንግሥት አርሻ

_____ ከገበያ

_____ ከገበያም ከመንግሥት አርሻም

_____ አቤት አካባቢ ተመርቶ

23. የጋር አተከላተ አላቸሁ?

_____ አዎ 1

_____ የለም 0

24. ከጋር አተከላተ ምር ታቸሁ ለሽያጭ ታቀርቧላቸሁ?

_____ አዎ 0

_____ የለም 1

25. ከብቶቸ አሉላቸሁ?

_____ አዎ 1

_____ የለም 0

V. የገቢ መጠንና የመገዚት አቅም

26. ጠቅላላ የወር ገቢ መጠን

_____ 51 – 100 1

_____ 151 – 250 2

_____ 251 – 350 3

_____ 351 – 450 4

27. ምገብ ቧለሆነ ነገር ግለተም / የቤተ ኪራይ፣ የቧንከ ከፍያ፣ መብራት፣ ውኃ፣ ለግጇ ... ወዘተ/ የሚውለው የወጪ መጠን ስንተ ነው?

_____ 5 – 45 1

_____ 46 – 85 2

_____ 86 – 120 3

28. የወር ተቀጣጪቸሁ ስንተ ነው?

_____ 0 – 25 1

_____ 26 – 50 2

_____ 51 – 85 3

VI. አገልግሎት

29. የገበያው አር ቀቱ ምን ያህል ይሆናል?

_____ በአቅራቢያው ምንም ገበያ የለም 0
_____ ከ2 ሰዓት በላይ የእግር ጉዞ 1
_____ 1 እስከ 2 ሰዓት የእግር ጉዞ 2
_____ 30 እስከ 60 ደቂቃ የእግር ጉዞ 3
_____ 15 እስከ 30 ደቂቃ " " 4
_____ ከ15 ደቂቃ ያነሰ " " 5

30. ለምገብ ግብሰያ ግገደ እገደለብ ያገኛሉ?

_____ አዎ 1
_____ የለም 0

31. ለገበያና ለመሰሰሉ ጉዞያቸው ተራገስፖርቱ ያስፈልገያታል?

_____ አዎ 0
_____ የለም 1

VII. ምገብ ግደራጀት መከተተና ግብሰል

32. በአቅራቢያያ የአሀሉ ቁፍቢ አለ?

_____ አዎ 1
_____ የለም 0

33. ነቁዘና የመሰሰሉ ተባዩች አሀሉ ያበላሸብያታል?

_____ አዎ 0
_____ የለም 1

34. ለይጥ አሀሉ ይበላብያታል?

_____ አዎ 0
_____ የለም 1

VI. አገልግሎት

29. የገበያው እርቀቱ ምን ያህል ይሆናል?

______ በአቅራቢያው ምንም ገበያ የለም 0

______ ከ2 ሰዓት በላይ የእግር ጉዞ 1

______ 1 እስከ 2 ሰዓት የእግር ጉዞ 2

______ 30 እስከ 60 ደቂቃ የእግር ጉዞ 3

______ 15 እስከ 30 ደቂቃ " " 4

______ ከ15 ደቂቃ ያነሰ " " 5

30. ለምግብ ማብሰያ ማገዶ እንደልብ ያገኛሉ?

______ አዎ 1

______ የለም 0

31. ለገበያና ለመሳሰሉት ጉዞዎች ትራንስፖርት ያስፈልግዎታል?

______ አዎ 0

______ የለም 1

VII. ምግብ ማደራጀት መከተትና ማብሰል

32. በአቅራቢያዎ የእህል ወፍጮ አለ?

______ አዎ 1

______ የለም 0

33. ነቀዝና የመሳሰሉ ተባዮች እህል ያበላሹብዎታል?

______ አዎ 0

______ የለም 1

34. አይጥ እህል ይበላብዎታል?

______ አዎ 0

______ የለም 1

VIII. ምግብን ማብሰልና ለቤተሰብ አባላት ማከፋፈል

35. ለቤተሰብ አባላት ምግብ የሚዘጋጀው እንዴት ነው?

_____ ለሁሉም አባላት አንድ ዓይነት 0

_____ ለተለያየ አባላት የተለያየ ዓይነት 1

36. የቤተሰብ አባላት ምግብ የሚቀርብላቸው እንዴት ነው?

_____ ለሁሉም በአንድ ማዕድ 0

_____ በቡድን በእድሜ የተለያየ ማዕድ 1

_____ ለአንድ ሰው አንድ ማዕድ 2

37. ለ36ኛው ጥያቄ መልሱ አዎ ከሆነ የአቀራረቡ ቅደም ተከተል ምን ይመስላል?

_____ ቤል፣ ሚስት፣ ከዚያም ልጆች 1

_____ ቤል፣ ከዚያ ሚስትና ልጆች 2

_____ ቤልና ሚስት፣ ከዚያም ልጆች 3

_____ ሁሉም አዋቂ በልቶ ሲያበቃ ልጆች 4

_____ እንደአመጣጣቸው ይቀርባል 5

_____ ልጆች ከዚያ አዋቂዎች 6

IX. ስለሥርአት ምግብ አወሳሰድ

38. ስለሥርዓተ ምግብ ትምህርት ተሰጥቶት ያውቃል?

_____ አዎ 1

_____ የለም 0

X. የማይበሉ/ የተከለከሉ ምግቦች

39. ለመብላት የተከለከሉ ምግቦች የትኞቹ ና ቸው? ምክንያቱስ?

ከአራስ ነት እስከ 5 ዓመት እድሜ ላሉ ቸው ህፃናት

ምግቦች _____

ምክንያቶች _____

_____

ከ5 ዓመት እድሜ በላይ ላሉ ህፃናት

ምግቦች _____

ምክንያቶች _____

_____

ለልጓገረዶች

ምግቦች _____

ምክንያቶች _____

_____

ለወንዶች ሰዎች

ምግቦች _____

ምክንያቶች _____

_____

ለአርጉዞች

ምግቦች _____

ምክንያቶች _____

_____

ለአመጢቶች

ምግቦች _____

ምክንያቶች _____

_____

ለአየቷ ወንዶች

ምግቦች _____

ምክንያቶች _____

_____

ለአየቷ ሴቶች

ምግቦች _____

ምክንያቶች _____

_____

ለታመሙ ሰዎች

ምግቦች _____

ምክንያቶች _____

_____

40. ንፋት የሚያመጡ ምግቦች አሉ ብለው ያምናሉ?

_____ አዎ 0

_____ የለም 1

41. ለፅኖው ጥያቄ መልሱ አዎ ከሆነ የትኞቹ ምግቦች ናቸው?

_____

_____

_____

XI. ባለፉት 24 ሰዓታት ውስጥ የነበረ አመጋገብ

42. በሚቀጥለው ገጽ ላይ የቤተሰቡን አባላት በትናንትና አለት ምን እንደበሉ ጠይቀ በተዘጋጀው ሰንጠረዥ መሙላት፤ አባሉት የተለያዩ ምግብ ተመገበው እንደሆነ ለለንጉ አባል እንዱ ወንጠረዥ መሙላት ያስፈልጋል::

በዚህ ገጽ ላይ ደግሞ የሚከተሉት ጥያቄ መልሶቸ ይሞሊሉ/ ይሠፍራሉ::

ሀ/ በትናንትና አለት ከቤተሰብ አባላት መካከል እቤት ያልበሊ ነበር?

_____ አዎ

_____ የለም

ለ/ መልሱ አዎ ከሆነ ሰንት ሰው?

_____ አንዱ

_____ ሁለት የአዋቂዎቸ ቁጥር _____

_____ ሰስት የልጆቸ ቁጥር _____

_____ ከሰስት በሊይ

ሐ/ በትናንትና አለት እቤት ውስጥ እንግዶቸ አስተናግደዋል?

_____ አዎ

_____ የለም

መ/ መልሱ አዎ ከሆነ ሰንት ነው?

_____ አንዱ

_____ ሁለት የአዋቂዎቸ ቁጥር _____

_____ ሰስት የልጆቸ ቁጥር _____

በትናንትናው እለት ምን ተመገቡ

የተጠየቀው ሰው ስም									
የምግቡ አይነት	ቀ	ም	ራ	ቀ	ም	ራ	ቀ	ም	ራ
እህልና ጥራጥሬ									
እንጀራ									
ዳቦ									
ቂጣ									
ገፍሮ									
ገንፎ									
የከብት ውጤቶች									
ሥጋ									
አሳ									
ወተት									
አይብ									
እንቁላል									
መሬት ሥር በቀሉ									
ቅጪ/ቡላ									
ስኳር ድንች									
ለሉ ምግቦች									
ወጥ									
አልጫ									
አተክልት									
ቡና ሻይም ሻይ									
ጠላ									

መፍቻ = ቀ — ቁርስ
ም — ምሳ
ራ — ራት

XII. የመኖሪያ ቤቶች ተግኝቶ በአይን መመልከት

43. በአለቱ ሲበስሉ ሲበሉ የታዩት ምግቦችን መዘርዘር መመገብ::

ቁ.	የምግብ ዓይነት	ግራም	ካሎሪ/ግራም	ካሎሪ/በምግብ
1	ቦቀሉ እሸት			
2	ቦቀሉ ጭቱት			
3	የስንዴ ጭቱት			
4	የጤፍ ጭቱት			
5	የቦቀሉ እንጀራ			
6	የጤፍ እንጀራ			
7	ሳቦ/ስንዴና ቦቀሉ/			
8	እንጀራ/ጤፍና ቦቀሉ/			
9	ቲጣ			
10	አምባሻ			
11	ቂጣ			
12	የቂጣ ቲጣ			
13	ምሥር ክክ ወጥ			
14	አተር ክክ ወጥ			
15	ሽሮ ወጥ			
16	የሥጋ ወጥ			
17	የዶንቸ ወጥ			
18	ዘይት			
19	ቀቤ			
20	ቦርቦሬ			
21	ዶንቸ			

ቁ.	የምግብ አይነት	ግራም	ካሎሪ/ግራም	ካሎሪ/በምግብ
22	ያተር ሽሮ			
23	ያተር ከክ			
24	ምሥር ከክ			
25	ሽንኩርት			
26	ቃሪያ			
27	ያበሻ ጐመን			
28	የበቆሎ ገፍሮ			
29	አደንጊሬ			
30	የአደንጊሬ ገፍሮ			
31	ባቄላ			
32	ቦቆ			
33	ወተት			
34	አይብ			
35				
36				
37				
38				
39				
40				
		ጠቅላላ የካሎሪ ይምር		

የጠያቂው ስም _____

የጠያቂው ፊርማ _____

DECLARATION

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in this or any other University, and that all sources of material used for the thesis have been duly acknowledged.

Name Haregewoin Cherinet /Bsc. S.R.N.

Signature Cherinet

Place Addis Ababa University

Date of submission 11 March 1991

This thesis has been submitted for examination with my approval as a University advisor.

Dr. Tadesse Alemu

Advisor