Economic Analysis of Food Consumption of Farm Families in Ratnagiri District (MS)

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Abstract

The availability of adequate and balanced diet holds the key to all economic developments through its effects on growth and efficiency of the human being. The information about consumption pattern of the people in the Ratnagiri district was undertaken with the sample consisted of two tahasil, eight villages and 120 households. The study revealed that the total income from all sources in the study area was found to increase with increases in size of holding. The per day per capita consumption of cereals, pulses, other vegetables, fruits, milk and milk product, nuts and oilseed, spices increased with increase in the size of holding and the consumption of flesh foods and eggs was decreased while the consumption of pulses was higher than recommended daily allowances in all the groups. The cost of diet per day per adult unit was Rs.34.48, Rs.40.47 and Rs.44.76 for small, medium and large groups respectively while the cost of diet on overall farms was 39.89 indicated that as the size of holding increased, the cost of diet per day also increased. The regression analysis both in respect of calorie and protein intake showed that size of family has negative influence for calorie and protein and the land holding has direct influence on the calorie and protein intake. Similarly, the food grain production had significant contribution in intake of both calorie and protein.

Introduction

Adequate and nutritious foods are necessary for good physical and mental health. Health and nutrition are important contributory factors in human resource development of any country. Among Indian population, about 40 per cent in rural and 30 per cent in urban areas are estimated below poverty line. Income, expenditure, family size and educational status are the most important factors which influence the dietary pattern and nutrition status of households. For improving the nutritional status are the improvement in households, literacy levels, improved agricultural technology for increasing the purchasing power of the households can improve the households nutritional status. Besides access and availability of food, preference and health awareness towards different food sources also played significant role in determining the food consumption pattern and overall. When the enough food is not consumed for satisfy the nutritional requirement of an individual over a long period of time, under nutrition results.

Under nutrition is a complex and multi-dimensional issues, affected mainly by a number of generic factors including poverty, inadequate food consumption due to access and availability issues, inequitable food distribution, improper maternal infant and child feeding and care practices, inequity and gender imbalance, poor sanitary and environmental conditions; and restricted access to quality health, education and social care services. A balanced diet is important because your body's organs and tissues need proper nutrition to work effectively. Without good nutrition, your body is more prone to disease, infection, fatigue, and poor performance. This estimate is corroborated by a high prevalence of anthropometric indicators that accompany undernourishment, such as being underweight. Even though there is overwhelming evidence that a large share of the Indian population does not have adequate access to food, quantifying the extent of the problem and its change over time remains problematic not only in India, but also in other developed and developing countries. Ratnagiri district which is one of the districts of konkan region of Maharashtra is selected for the present study. Latest information about the dietary pattern and nutritional status of farmers of this district is not available.

Therefore, the present study was undertaken with the following objectives:

- To estimate cost of diet and proportion of income spent on food.

- To identify factors affecting variation in nutritional level of sample respondent

Materials and Methods

The sampling method used in the present investigation consists of three stages of random sampling, namely selection of tahasil, selection of villages and selection of households. The study was conducted in Ratnagiri district. Ratnagiri district consist of nine tahasils. Out of these, two tahasils namely Dapoli and Lanja were selected randomly for the present study. From the selected tahasils, four villages were selected randomly and from each selected villages; list of farmers along with their size of holding was obtained from the concern village revenue officers (Talathi). The farmers were classified in three size groups of holding viz. small (up to 2ha.), medium (2.01-4ha.) and large (above 4ha.). A sample of 15 farmers from each category was selected randomly from each village. Thus, the final sample consisted of two tahasil, eight villages and 120 households. The data were collected by survey method by personally interviewed selected farm families. The data on prices of different raw food materials were collected from the local shopkeeper. The information and data for the present study was pertain to the agricultural year 2012-13. The data were analyzed by using simple tabular analysis and statistical tools like arithmetic means, percentages; frequency distribution was used in this study to draw desired conclusions. The balance diet, calories and protein was estimated by using conversion table in the book "Nutritive value of Indian Foods" written by C. Gopalan of NIN, Hyderabad [1]. The multiple regression analysis is carried out to estimate the influence of various factors on the intake of calories and proteins. Separate regression equation was fitted for calorie and protein intake.

The following form of linear function is used-

$$Y = f(X_1 \ X_2 \ X_3 \ X_4 \ X_5 \ X_6)$$

Where,

Y= Per capita calorie (Kcal) /protein (g) consumption.

X_1= Number of adult units

X_2= Size of holding (ha)

X_3= Annual income from all sources (Rs.)

X_4= Foodgrain production (Kg/ha)

X_5= Educational level (Scores)

X_6= Foodgrains purchased (Kg.)

Results and Discussion

Cropping Pattern

Cropping pattern is important factor influencing the dietary pattern of farming households because; there is a natural tendency among cultivators to consume those commodities in greater quantities which are grown on the farm. Table 1 gives the area under different crops. The table showed that the 2.86 hectares of gross cropped area, 0.55 (19.23 per cent) was under kharif rice and 0.05 hectares (1.75 per cent) was under nagli, 0.08 hectares (2.80 per cent) was under pulses, 0.09 hectares (3.15 per cent) was under rabi vegetables crops. The remaining 23.08 per cent and 50.35 per cent area was under fruit crops and nut crops respectively. The proportion of area under Kharif rice and nagli decreased with the increase in the size of holding while an opposite trend was observed in case of nuts crops. The area under fruit crops and nuts crops was found to maximum in large size group 22.05 per cent and 57.09 per cent respectively.

Groups	Kharif (ha)		Rabi (ha)		Perennial (ha)		Gross cropped area (ha)
	Rice	Nagli	Pulses	Vegetable crops	Fruit crops	Nut crops	
I	0.34 (29.06)	0.04 (3.42)	0 (0)	0.02 (1.71)	0.34 (29.06)	0.43 (36.75)	1.17 (100)
II	0.59 (25.21)	0.05 (2.14)	0.09 (3.85)	0.10 (4.27)	0.51 (21.79)	1.00 (42.74)	2.34 (100)
III	0.72 (14.17)	0.05 (0.98)	0.15 (2.95)	0.14 (2.76)	1.12 (22.05)	2.90 (57.09)	5.08 (100)
Overall	0.55 (19.23)	0.05 (1.75)	0.08 (2.80)	0.09 (3.15)	0.66 (23.08)	1.44 (50.35)	2.86 (100)
(Figures in the parentheses are percentages)							

Table 1: Cropping Pattern.

In Group I, the area under food grain crops was 32.48 per cent and area under perennial crops was 65.81 per cent. In Group II, the area under foodgrain crops was 31.20 per cent and area under perennial crops was 64.53 per cent. In Group III, the area under foodgrain crops was 18.10 per cent while area under perennial crops was 79.14 per cent. Thus, the percentage of area under foodgrain crops decreased with the size of holding.

Income from Different Sources

Income from various sources such as agriculture, service, business, wage earning and other source is presented in Table 2. The total income from all sources was found to increase with increases in size of holding. The total income from all sources was found to maximum in Group III (Rs.120900) and minimum in Group I (Rs.66912.5). Overall average income was Rs.97045.83. The proportion of income from agriculture was highest in all size groups, ranging from 39.90 per cent in Group I to 89.27 per cent in Group III with overall proportion of 63.66 per cent. The income from service was highest in Group I (Rs.19750) and lowest in Group III (Rs.5600) with an overall average income of Rs.14616.67 (17.35 per cent). The overall income from business was Rs.7275 (7.99 per cent). And it was highest in Group II Rs.8950 (8.66 per cent) followed by Group I Rs.7000 (10.46 per cent) and Group III Rs.5875 (4.89 per cent). The income earned from wage earning was the highest in Group I Rs.12625 (18.87 per cent) followed by Group II Rs.10750 (10.40 per cent) and Group III Rs. 1500 (1.24 per cent). The overall income from wage earning was Rs.8291.67 (10.17 per cent). The overall income earned from other source was Rs.704.17 (0.83 per cent). It was highest in Group II Rs.1275 (1.24 per cent). The per capita income of Group I, Group II, Group III were Rs.13711.58, Rs. 19870.19 and Rs.22682.93 with overall per capita income Rs. 18880.51.

Groups	Agriculture	Service	Business	Wage earning	Other	Total	Per capita income
I (small farmers)	26700 (39.90)	19750 (29.52)	7000 (10.46)	12625 (18.87)	837.5 (1.25)	66912.5 (100)	13711.58
II (medium farmers)	63850 (61.80)	18500 (17.90)	8950 (8.66)	10750 (10.40)	1275 (1.24)	103325 (100)	19870.19
III (large farmers)	107925 (89.27)	5600 (4.63)	5875 (4.86)	1500 (1.24)	0 (0)	120900 (100)	22682.93
Overall	66158.33 (63.66)	14616.67 (17.35)	7275 (7.99)	8291.67 (10.17)	704.17 (0.83)	97045.83 (100)	18880.51
(Figures in parentheses indicate percentages) (Fig. in Rs.)							

Table 2: Income from different source.

Food-stuff Consumption

Per capita per day consumption of food item by the sample farm households is given in Table 3. It is observed from the Table 3 that per day per capita consumption of cereals, pulses, other vegetables, fruits, milk and milk product, nuts and oilseed, spices increased with increase in the size of holding and the consumption of flesh foods and eggs was decreased while consumption of leafy vegetables was highest in Group I and lowest in Group II. The consumption of pulses was higher than recommended daily allowances in all three groups. Also in the consumption of fats and oils highest in Group III and lowest was Group II and in the consumption of sugars it was observed that the highest was Group I and lowest was Group II. It was observed that the consumption of fruits was higher than minimum requirements in Group III whereas the consumption of all other food items was much lower than the needed minimum on sample farmers [2].

Food-stuff	Groups			Overall	Recommended daily allowances
	I	II	III		
1. Cereals					
a) Rice	163.93	196.15	208.26	189.45	NA

b) Other cereals and millets	141.39	146.15	161.35	149.63	NA
c) Total	305.32	342.3	369.61	339.08	460
2. Pulses	51.23	57.69	60.04	56.32	40
Total food grain	356.55	399.99	429.65	395.40	500
3. Leafy vegetables	45.08	40.38	45.03	43.50	50
4. Other vegetables	45.08	59.62	61.91	55.54	60
5. Roots and tubers	36.89	34.62	37.52	36.34	50
6 Fruits	22.54	26.92	31.89	27.12	30
7. Milk and milk product	75.81	92.31	140.71	102.94	200
8.Fats and oil	24.59	23.08	26.67	24.78	30
9. Flesh foods and eggs	10.35	9.62	9.38	9.78	30
10. Nuts and oilseed	4.10	5.19	5.63	4.97	NA
11. Spices	40.98	42.31	48.78	44.02	NA
12. Sugars	28.69	26.92	28.14	27.92	40
(NA- Not Available) (Fig. in gms)					

Table 3: Per day per capita quantities of foodstuffs consumed.

Income and Calorie-protein Intake

The total number of 120 households was divided into 4 groups according to their total annual income from all sources, and per capita protein and calorie intake was estimated according to income levels to study the relationship between income and calorie-protein intake.

Per capita average income increased from Rs.11668.67 in Group I to Rs.25214.72 in Group IV. The calorie and protein intake were also found to increase with increases in income. The calorie intake increased from 1643.69 calories to 2079 calories and protein intake increased from 43.22 grams to 51.07 grams from income Group I to income Group IV. This indicated that income of family is an important factor influencing nutritional status considerably Table 4. Adequate income, therefore, is necessary to ensure good nutrition [3].

Income groups (Rs.)	No. of households	Average family size (No.)	Per capita average income (Rs.)	Calorie intake (Kcal)	Protein intake (gms)
I. Up to 50000	10	3.9	11668.67	1643.69	43.22
II. 50000-100000	62	5.12	15524.74	1914.14	48.07
III. 100000-150000	37	5.22	23113.98	2047	49.32
IV. Above 150000	11	6.35	25214.72	2079	51.07
Overall	120	5.14	18880.52	1920.95	47.92

Table 4: Per capita protein and calorie consumption according to income level.

Cost of Diet

Costs of diet per day per adult and per family per year worked out taking into consideration all foodstuffs consumed by sample farmer. The prices of different food items are given in Appendix III. The cost of diet according to size groups of holding and for overall sample farmers is given in Table 5.

Food stuff	Groups			Overall
	I	II	III	
1. Cereals	5.78	7.05	6.97	6.6
2. Pulses	2.52	3.18	3.07	2.92
3.Leafy vegetables	1.67	1.67	1.70	1.68
4. Other vegetables	1.15	1.72	1.61	1.49
5. Roots and Tubers	0.70	0.74	0.74	0.73
6. Fruits	1.12	1.50	1.60	1.41
7. Fats and oils	6.49	8.28	11.70	8.82
8. Milk and milk product	3.00	3.07	3.24	3.10
9. Flesh foods and eggs	0.86	0.95	0.87	0.89
10. Nuts and oilseeds	0.40	0.58	0.60	0.53
11. Spices	9.36	10.30	11.25	10.30
12. Sugars	1.43	1.43	1.41	1.42
13. Cost of diet per day per adult unit	34.48	40.47	44.76	39.89
14. Cost of diet per adult unit per year	12585.20	14771.55	16337.40	14559.85
15. Adult units/ households	4.88	5.2	5.33	5.14
16. Cost of diet/ households/year	61415.77	76812.06	87078.34	75102.06
17. Family income	66912.5	103325	120900	97045.83
18. Percentage share of expenditure on food of family income	91.78	74.34	72.03	77.39
(Fig. in Rs.)				

Table 5: Cost of diet and percentage share of expenditure on food-stuffs.

It is observed from the table that cost of diet per day per adult unit was Rs.34.48, Rs.40.47 and Rs.44.76 for small (Group I), medium (Group II) and large (Group III) groups respectively while the cost of diet on overall farms was 39.89. This indicated that as the size of holding increased, the cost of diet per day also increased.

Average size of family i.e. Adult unit varied from 4.88 in small size group (Group I) to 5.33 in large size group (Group III) with 5.14 adult units on overall farms. On the basis of adult unit, the cost of diet per family per year was estimated and it was found that each family spent Rs. 61415.77 in Group I, Rs.76812.06 in Group II and Rs. 87078.34 in Group III with overall average of Rs. 75102.06 [4].

Regression Analysis

Multiple linear regression analysis was carried out to know the extent of contribution of selected factors in the calorie and protein intake. Multiple regressions were estimated expressing calorie intake and protein intake as dependent variables separately for each size group of holding and also for all size groups taken together. Calorie and protein intake (Y) are expressed as a function of family size (X_1), size of holding (X_2), family income (X_3), education level (X_4), food grain production (X_5) and food grain purchased (X_6). Estimated coefficients of regression for calorie and protein intake, their standard errors and coefficients of multiple determination (R^2) are given in Table 5.24 A and 5.24 B, respectively.

Regression analysis for calorie intake

It is seen from Table 6 that the regression coefficient for family size (X_1) in all size groups as well as for overall sample was negative and also statistically significant at 1 per cent level of probability. It is clearly indicated that as the size of family increased, calorie intake was found to be decreased. The regression coefficients for size of holding (X_2) were negative but non-significant for Group II. It was positive but non-significant for Group III. However, in case of Group I and overall sample, it was positive and significant at 5 per cent level and 1 per cent level of probability respectively. Regression coefficients for food grain production non-significant in Group I. It was negative in Group III and not significant. Regression coefficients for food grain purchased (X_6) were positive but not significant.

In general, it was found that the size of family has negative effect on calorie intake while the regression coefficient at overall level for land holding were found to be significant at 1 per cent level indicating positive influence on the calorie intake. Similarly, the food grain production has positive, but none significantly influence on calorie intake. In case of calorie intake, the variation explained by the explanatory variables were 62 per cent in Group I, 59 per cent in Group II, 71 per cent in Group III with overall

variation explained being 60 per cent. This indicated that the variables selected were important in influencing calorie intake.

Regression coefficients (b_1's)	Groups			Overall
	I	II	III	
a (intercept)	2143.39	2830.99	3081.77	2505.98
X_1 (family size)	-112.23** (37.48)	-244.64** (41.72)	-245.07** (41.87)	-212.32** (23.65)
X_2 (land holding)	348.36* (156.71)	-81.30 (325.91)	32.75 (68.66)	81.05** (29.71)
X_3 (family income)	-0.0029 (0.0039)	0.0008 (0.0034)	0.0042* (0.0020)	0.0015 (0.0016)
X_4 (education level)	-9.23 (14.68)	-1.44 (17.02)	-11.30 (12.75)	-9.03 (8.82)
X_5 (food grain production)	0.077 (0.15)	0.35* (0.11)	-0.045 (0.085)	0.19** (0.055)
X_6 (food grain purchased)	0.42 (0.98)	1.8 (1.32)	1.35 (1.36)	1.12 (0.68)
R^2	0.62	0.59	0.71	0.60
(Figures in the parentheses are standard errors of the coefficients) ** Significant at 1 per cent level of probability *Significant at 5 per cent level of probability				

Table 6: Regression coefficients of selected variables in respect of calorie intake.

Regression analysis for protein intake

In case of protein intake (Table 7), the regression coefficients for family size (X_1) were found to be negative and significant at 5 per cent level in Group I and 1 per cent level in Group I, Group II and overall sample households. This indicated that per capita protein consumption decreased with increase in the size of family. Regression coefficients for land holding (X_2) were negative in Group II and not significant. Whereas it was positive in Group I and overall sample and significant at 5 per cent level. As regard the coefficients for family income (X_3), they were negative in Group I and Group II, and positive in Group III and overall sample but not significant. Regression coefficients for education level (X_4) were negative in all groups and overall sample except Group II but it is not significant. Regression coefficients for food grain production (X_5) were positive in all groups and overall sample except Group III and significant at 1 per cent level in Group II and overall sample. Regression coefficients for food grain purchased (X_6) were positive but non-significant.

The variation explained, as indicated by the value of R^2, was 52 per cent in Group I, 56 per cent in Group II and 70 per cent in Group III with overall value of R^2 as 55 per cent. This explains that selected variables were influence by 52 to 70 percent.

Regression coefficients (b_1's)	Groups			Overall
	I	II	III	
a (intercept)	46.37	69.25	73.42	57.64
X_1 (family size)	-2.23* (0.96)	-5.16** ((0.99)	-4.77** (1.21)	-4.37** (0.62)
X_2 (land holding)	9.11* (4.01)	-3.90 (7.70)	0.72 (1.98)	1.94* (0.78)
X_3 (family income)	-0.0000573 (0.0001)	-0.00001 (0.000080)	0.0000945 (0.000058)	0.0000184 (0.000041)
X_4 (education level)	-0.15 (0.38)	0.23 (0.40)	-0.21 (0.37)	-0.062 (0.23)
X_5 (food grain production)	0.003 (0.0038)	0.009** (0.0026)	-0.0032 (0.0024)	0.0046** (0.0014)
X_6 (food grain purchased)	0.0014 (0.025)	0.038 (0.031)	0.030 (0.039)	0.023 (0.018)
R^2	0.52	0.56	0.70	0.55
(Figures in the parentheses are standard errors of the coefficients) ** Significant at 1 per cent level of probability * Significant at 5 per cent level of probability				

Table 7: Regression coefficients (b_1's) for selected variable in respect of protein intake.

The regression analysis both in respect of calorie and protein intake showed that size of family has negative influence for calorie and protein. Therefore, the size of family must be kept minimum for better calorie and protein intake. Also, the land holding has direct influence on the calorie and protein intake. (Asha, L., et al.) [5] Similarly, the food grain production had significant contribution in intake of both calorie and protein. This means that farmers own production of food grain is more important. Selected variables were important in one way or the other in influencing variation in dietary intake as indicated by regression analysis.

Summary and Conclusions

Nutrition is taking consciously essential nutrients that body's main requirement adequately and in balance for preventing health and improving quality of life. A poor nutrition hampers health and productivity of labour, resulting in the retardation of agricultural

growth. The availability of adequate and balanced diet holds the key to all economic developments through its effects on growth and efficiency of the human being. The information about dietary pattern and the nutritional status of the people in Ratnagiri district was not available, therefore, present study was undertaken, and following conclusions were drawn from the study.

1. Per capita per day cost of diet varied from Rs.34.48 to Rs.44.76 and the per capita per annum cost of diet varied from Rs.12585 to Rs.16337. Overall per capita per day cost of diet worked out to Rs.39.89. The food expenditure on fats and oils, flesh food and eggs, spices and sugar were decreased as income increased. As it indicated that the farmers having more income who are may be health conscious.

2. Per capita average income increased from Rs.11668.67 in Group I to Rs.25214.72 in Group IV. The calorie and protein intake were also found to increase with increases in income. The calorie intake increased from 1643.69 calories to 2079 calories and protein intake increased from 43.22 grams to 51.07 grams from income Group I to income Group IV. This indicated that income of family is an important factor influencing nutritional status considerably. Adequate income, therefore, is necessary to ensure good nutrition.

3. The size of family has negative effect on calorie intake while the regression coefficient at overall level for land holding were found to be significant at 1 per cent level indicating positive influence on the calorie intake.

4. The regression analysis both in respect of calorie and protein intake showed that size of family has negative influence for calorie and protein. Therefore, the size of family must be kept minimum for better calorie and protein intake.

Implications

As size of family has negative influence for calorie and protein. Therefore, the size of family must be kept minimum for better calorie and protein intake. Also, the land holding has direct influence on the calorie and protein intake. Family income, education level and food grain purchased had no much influence on calorie intake and protein intake. Similarly, the food grain production had significant contribution in intake of both calorie and protein. This means that farmers own production of food grain is more important.

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