THE COST OF BALANCED DIETS AT THE HOUSEHOLD LEVEL

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Summary

Most programmes designed to ensure food security at the regional and national levels fail to examine the major obstacles in guaranteeing access to enough, good quality and safe food at the household level. An obvious strategy for feeding expanding populations would no doubt be to produce more food. But, it must also be ensured that people can afford the food that is available so that food security for families becomes a reality. It is therefore necessary to determine the least it would cost to feed families adequately in order to help planners in tackling food production, distribution and general health goals as well as determining income levels for the population. The balanced diet concept was used to plan diets for different age groups in the family and the family as a whole. Food composition tables were used to calculate the amounts of nutrients and energy supplied by the ingredients used. All the meals were planned to meet FAO's daily recommended nutrient and energy allowances and the portion sizes were also adequate. The ingredients used were the least expensive alternatives among the Ghana six food groups. The meals were costed and the results revealed that if one should use the minimum wage as a reference, then most families especially those in the low income bracket are able to consume only one adequate meal per day. This indicates that low income, is still a serious obstacle to feeding families adequately.

Introduction

Food security has been defined in several ways. Finney (1984), summarises it to include a guarantee of adequate supplies of food through production; a guarantee of stability of those supplies; and a guarantee of accessibility to the supplies for the hungry people who need the food.

In December 1992, a Declaration and Global Plan of Action was adopted at the International Conference on Nutrition (ICN) to ensure that all people in all countries are able to meet one of their most basic needs, that is, the consumption of a healthy, nutritious diet. This noble objective recognizes the fact that the human body will only attain and maintain a healthy condition if it receives a supply of food that provides adequate amounts of all the nutrients and an appropriate amount of energy. Such a diet is known as a balanced diet. Inadequate or imbalanced intakes of nutrients have been found to be detrimental to the health of individuals which may retard national development efforts if the majority of a nation's population is affected.

Like many other researchers, Schafer *et al.*, (1980) have found that family income among other socio-demographic factors affect dietary adequacy.

Generally, families allocate money for food according to their respective incomes. Many families in Ghana have limited funds to spend on food and this factor makes it extremely difficult to purchase enough food to eat to meet their needs. Although it is possible that with sufficient knowledge of how to plan balanced diet, a competent homemaker could stretch the food budget to obtain reasonably good diets, there is a limit below which it becomes impossible to acquire adequate nutrition for the family.

Considering the problem of low incomes nation-wide, and the increasing rise in the cost of living, one wonders how the global plan of action to ensure consumption of healthy, nutritious diets by all people could materialize under the present circumstances. The objectives of the present study are:

i) to investigate how much a daily balanced diet would cost to feed selected vulnerable individuals in the family and the family as a whole at current food prices in Ghana;
ii) to compare the daily cost of meals with the minimum wage to determine what chances families on low incomes have of consuming balanced diets.

Methodology

The balanced diet concept was used to plan and prepare a number of meals for various individuals at different physiological stages in the life cycle.

As Fox and Cameron (1989) point out, this concept makes it possible to develop an analytical and chemical approach to food and diet. It is based on using food composition tables and calculating the amount of different nutrients and energy supplied by a given quantity of food.

The three-meal pattern (plus snacks for children, adolescents, pregnant and lactating women) was used for planning the diets. The least expensive varieties of food items among each of the Ghana six food groups were used to reduce cost. The food items were weighed using dietary scales before preparing the meals or snacks. The Ghana Food Tables (in ounces) by the Ghana Food Research Institute were used to analyse the diets for their Energy, Protein, Calcium, Iron, Vitamin A, Thiamin, Riboflavin, Ascorbic acid and Niacin contents. The International Recommended Nutrient Allowances compiled by FAO (1980), were used as standard reference data for judging adequacy of the diets.

All the diets planned met 100% or at least 66% of the Recommended Dietary Allowances (R.D.A) of energy and the nutrients appropriate for the age, sex and physiological state.

Gibson (1991) draws attention to the fact that a nutrient intake below the recommended level does not necessarily mean that the individual intake is inadequate to meet his own requirements. This is because the recommended levels for nutrients exceed the actual requirements of most individuals because they are generally set at the mean requirement plus two standard deviations.

However, habitual intake by an individual of values below the recommended intake is not safe since it increases the individual's risk of developing deficiency symptoms.

The meals were planned, prepared and costed between March and May 1993 and were evaluated as adequate with respect to quantity, taste, appearance, texture and flavour by at least 8 experienced Home Economists. The costs of the meals represent only the costs of ingredients as purchased from Madina market (a suburb of Accra).

Results

For the purposes of this study, the results will illustrate a complete day's menu including 2 snacks for each of two age groups namely, the pre-school child and the adolescent as well as two different main meals for a family of five of a given composition. The two age groups highlighted represent the youngest and the oldest among the children, the cost of whose diets could be used to estimate that of other members of the family, which one can use to compute the cost of the daily diet of a family of any given number and composition.

Tables 1 and 2 give the cost, energy and nutrient values of a day's balanced meals plus snacks for a 4-5 year old pre-school child and a 16-19 year old adolescent male respectively.

Tables 3 and 4 give the cost, energy and nutrient values of two different main meals each representing ⅓ of the R.D.A. for a family of five comprising of a father, a lactating mother, a 17 year old boy, an 8 year old girl and a 5 year old pre-school child. Assuming that the family would consume 3 meals a day in order to meet its requirements, one could then compute the cost of the whole day's meals. The menu for each illustration is given below each table.

All the meals met the daily energy and nutrient requirements except for riboflavin in all the diets and also iron and niacin in the whole family meals. However, the affected values met at least 66% of the requirements.

TABLE 1

Cost, Energy and Nutritive values of a day's menu for a pre-school child (4-5yrs)

Food Items	Cost ¢	Weight (oz)	Energy Kcal	Protein (gm)	Calcium (mg)	Iron (mg)	Vitamin 'A' (IU)	Thiamin (mg)	Riboflavin (mg)	Ascorbic Acid (mg)	Niacin (mg)
Breakfast											
Millet flour	12.00	1½	158	5.0	12	1.7	0	0.14	0.06	0	0.90
Fish Meal	22.00	1/5	20	3.8	150	0.6	0	0.01	0.02	0	0.35
Akala	40.00	1	107	2.1	8	0.6	0	0.11	0.02	0	0.20
Dried Skim Milk	20.00	½	50	5.1	175	0.2	5	0.05	0.25	1	0.15
Onion	1.00	⅛	2	0.1	1	-	2	0	0	0.4	0.01
Total	**95.00**		**337**	**16.1**	**346**	**3.1**	**7**	**0.31**	**0.35**	**1.4**	**1.61**
Snacks											
Orange Juice	30.00	1	15	0.3	3.0	0.1	60	0.02	0.01	14	0.10
Corn Flour	2.00	⅓	35	0.9	0.7	0.2	43	0.04	0.01	0	0.20
Sugar	3.00	1	29	0	0	0	0	0	0	0	0
Cooking oil	8.75	¼	63	0	0	0	0	0	0	0	0
Banana	6.30	1½	36	0.6	4.5	0.2	-	0.02	0.02	5	1.30
Roasted Groundnuts	5.50	1/4	42	1.8	4.0	0.1	3	0.06	0.01	0	1.20
Total	**55.55**		**220**	**3.6**	**12.2**	**0.6**	**106**	**0.14**	**0.05**	**19**	**1.80**
Lunch											
Yam	23.20	4	124	2.8	24	0.8	-	0.12	0.04	12	0.40

Palm Oil	80.00	1	255	0	0	-	17,000	-	-	-	-
Onion	3.00	¼	3	0.1	2	0.03	4	0.00	0.00	1	0.03
Tomatoes	20.00	1	7	0.3	3	0.2	200	0.02	0.01	7	0.20
Margarine	8.00	¼	128	0	0	0	850	-	-	-	-
Leaves	23.52	2	20	1.8	92	1.6	340	0.06	0.01	40	0.40
Agushie	10.00	¼	45	2.3	3	0.3	-	0.01	0.01	-	0.13
Fish meal	11.00	⅛	10	1.9	75	0.3	-	0.00	0.01	-	0.20
Dawadawa	3.00	1/16	9	0.6	9	0.6	-	0.00	0.01	-	0.02
Total	**181.72**		**601**	**9.8**	**208**	**3.8**	**18,394**	**0.21**	**0.18**	**60**	**1.38**
Supper											
Rice	40.00	3	297	5.7	9	0.9	-	0.6	0.03	-	0.15
Groundnut Paste	36.00	1½	251	11.0	23	0.8	15	0.4	0.05	-	6.90
Tomatoes	15.00	1	7	0.3	3	0.2	200	0.0	0.01	7	0.20
Onion	3.00	¼	3	0.1	2	0.0	4	0.0	0.00	0.8	0.03
Sm. Salmon	31.00	1	90	20	1	-	120	1.1	0.05	2.2	0.17
Dawadawa	3.00	1/6	19	0.6	9	0.6	-	0.0	0.01	-	0.02
Total	**128.00**		**667**	**38**	**47**	**2.5**	**339**	**2.1**	**0.15**	**10**	**7.5**
Total for all meals	**460.27**		**1825**	**68**	**613**	**10.0**	**846**	**2.76**	**0.73**	**90**	**12.3**
R. D. A.			1830	20	400	10	1,000	0.7	1.1	20	12.1

Menu: Breakfast : Millet Porridge, Fish meal, Akala
Lunch : Mashed Yam, Leaves & Agushie Stew
Supper: Boiled White Rice, Groundnuts Soup.

Mid-morning Snack: Banana, Roasted Groundnut
Mid-afternoon Snack: Cornflour Sticks, Orange Juice

TABLE 2

Cost, Energy and Nutritive values of a day's menu for an adolescent male 16-19 yrs.

Food Items	Cost ¢	Weight (oz)	Energy Kcal	Protein (mg)	Calcium (mg)	Iron (mg)	Vitamin 'A' (IU)	Thiamin (mg)	Riboflavin (mg)	Ascorbic Acid (mg)	Niacin (mg)
Breakfast											
Corn	15.00	3	312	8.1	6	2.1	390	o,39	0.09	0	1.80
Bread	30.00	2	146	4.4	8	0.4	0	0.06	0.02	0	0.04
Groundnut Paste	12.00	½	84	3.7	0.8	0.3	5	0.12	0.02	0	2.30
Sugar	6.00	½	57	0	0	0	0	0	0	0	0
Total	**63.00**		**599**	**16.2**	**15**	**2.8**	**395**	**0.57**	**0.13**	**0**	**4.14**
Snacks											
Ripe Plantain	30.00	3	105	0.9	6	0.6	270	0.6	0.06	15	0.60
Palm Oil	40.00	½	128	0	0	0	8500	0	0	0	0
Ginger		⅛	0	0	0	0	0	0	0	0	0
Pepper	10.00	¼	25	0.8	5	0.5	250	0.01	0.03	0	1.25
Wheat flour		¼	25	0.8	1.3	0.1	0	0.01	0.03	0	0.01
Onion	6.00	½	7	0.2	5	0.1	7	0.01	0.01	1.5	0.05
Roasted Groundnuts	22.00	1	197	6.2	13	1.2	0	0	0	0	0
Pineapple	30.00	8	120	0.8	72	0.8	240	0.16	0.08	80	0.80
Total	**138.00**		**607**	**9.7**	**102**	**3.3**	**9267**	**0.79**	**0.21**	**97**	**2.71**
Lunch											
Kenkey	70.00	11	429	11	11	2.2	0	0.33	0.11	0	2.2

Fresh Fish	80.00	4	192	22.8	44	1.2	120	0.08	0.24	0	3.2
Cooking Oil	12.00	1	255	0	0	0	0	0	0	0	0
Fresh Pepper	12.50	¼	3	0.1	1	0.1	93	0.01	0.01	8	0.08
Tomatoes	60.00	3	21	0.9	9	0.6	600	0.06	0.03	21	0.60
Onion	6.00	½	7	0.2	5	0	7	0	0	1	0.06
Total	**240.00**		**907**	**35.0**	**70**	**4.1**	**820**	**0.48**	**0.39**	**30**	**6.16**
Supper											
Cassava flour	33.36	8	736	3.2	128	8.8	0	0	0.08	0	1.60
Okro	72.00	4	48	2.0	84	1.2	400	0.12	0.08	24	1.20
Tomatoes	60.00	3	21	0.9	9	0.6	600	0.06	0.03	21	0.06
Onion	6.00	½	7	0.2	5	0	7	0	0	1	0.05
Sm. Salmon	72.72	2	180	40.0	240	2.2	0	0.10	0.34	0	4.40
Dried Pepper	12.50	¼	25	1.5	5	0.5	254	0.01	0.02	0	1.25
Total	**256.58**		**1017**	**47.8**	**471**	**13.3**	**1257**	**0.29**	**0.55**	**46**	**8.56**
Total for all meals	**705.58**		**3130**	**1081**	**658**	**23.5**	**11739**	**2.13**	**1.28**	**173**	**21.6**
R.D.A.			**3070**	**38**	**600**	**18**	**2500**	**1.2**	**1.8**	**30**	**17.0**

MENU: **Breakfast:** Corn Grits Porridge, Bread, Groundnut Paste
Lunch: Ga Kenkey, Fried Fish, Fresh Pepper Sauce
Supper: 'Kokonte', Okro Soup
Mid-morning Snack: Tatale, Roasted Groundnuts
Mid-afternoon Snack: Cut Pineapple

TABLE 3

Cost, Energy and Nutritive values of a main meal for a family of five

Food Items	Cost ¢	Weight (oz)	Energy kcal	Protein (gm)	Calcium (mg)	Iron (mg)	Vitamin 'A' (IU)	Thiamin (mg)	Riboflavin (mg)	Ascorbic Acid (mg)	Niacin (mg)
Cassava flour	200.00	32	2944	12.8	512	35.2	0	0	0.32	0	6.4
Groundnut Paste	125.00	5	835	36.5	75	2.5	50	1.2	0.15	0	23.0
Tomatoes	100.00	8	56	2.4	24	1.6	1600	0.16	0.08	56	1.6
Onion	12.00	1	13	0.4	9	0.1	14	0.01	0.01	3	0.1
Pepper	20.00	½	50	1.6	10	1.0	500	0.02	0.06	15	0.1
Sm. Salmom	170.00	5 ¾	518	115	690	6.3	0	0.29	0.98	0	12.6
Kuka	20.00	1	80	7.2	780	5.4	3000	0.04	0.07	10	0.3
Dawadawa	10.00	¼	35	2.5	38	2.3	0	0.00	0.05	0	0.1
Salt	2.00	0	0	0	0	0	0	0	0	0	0
Pineapple	50.00	10	150	1.0	90	1.0	300	0.20	0.10	100	1.0
Total for meal	**709.00**		**4681**	**179**	**2228**	**55.4**	**5464**	**3.12**	**1.82**	**174**	**45.2**
1/3 R.D.A			**4280**	**55.3**	**933**	**66**	**3773**	**1.7**	**2.60**	**50**	**28.3**

MENU: Kokonte - Groundnut soup; Cut Pineapple

TABLE 4

Cost, Energy and Nutritive values of a main meal for a family of five

Food Items	Cost ¢	Weight oz)	Energy kcal	Protein (gm)	Calcium (mg)	Iron (mg)	Vitamin 'A' (IU)	Thiamin (mg)	Riboflavin (mg)	Ascorbic mg)	Niacin (mg)
Corndough	150.00	26	1664	41.6	52	10.4	0	1.04	0.26	0	5.2
Cassavadough	50.00	8	336	2.4	72	1.6	0	1.16	0.08	0	1.6
Palmnuts	100.00	40	2400	4.0	400	16.0	192000	1.20	0.40	0	8.0
Mushrooms	100.00	2	16	1.4	4	0.6	0	0.06	0.26	4	3.0
Sm. Salmom	66.00	2	210	40.0	480	2.2	48	0.04	0.18	0	2.8
Snails	134.00	3½	105	20.0	210	20.3	0	0.04	0.39	0	2.5
Dried Okro	25.00	1¼	100	5.0	250	3.5	138	0.05	0.11	1	2.0
Red Pepper	20.00	¼	3	0.1	1	0.1	94	0.01	0.01	8	0.1
Tomatoes	100.00	8	56	2.4	24	1.6	1600	0.16	0.08	56	1.6
Onion	15.00	1½	20	0.6	14	0.2	21	0.02	0.02	5	0.2
Salt	2.00	0	0	0	0	0	0	0	0	0	0
Total for Meal	**762.00**		**4910**	**117**	**1507**	**56.5**	**193901**	**3.78**	**1.79**	**74**	**27.0**
1/3 R.D.A.			**4280**	**55.3**	**933**	**66**	**3773**	**1.70**	**2.60**	**50**	**28.3**

MENU: Banku - Palmnut Soup

With respect to the costs of the diets, the results reveal that it costs about ¢460.00 to feed the pre-school child whilst it costs about ¢700.00 to feed the adolescent daily. From the investigations the cost of feeding the school-aged child was about ¢500.00, that of the pregnant, lactating mother and a normal adult male was about ¢600.00 each. A rough estimate of the daily cost of adequately feeding a family of five would then be as follows:

Father	-	¢ 600.00
Mother	-	¢ 600.00
Adolescent	-	¢ 700.00
School child	-	¢ 500.00
Pre-school child	-	¢ 460.00
Total cost	=	**¢2,860,00**

The results show that the cost of a major meal is roughly between ¢700.00 and ¢760.00. Using these values, a rough estimate of the cost of meals for the whole day for the given family of five would then be between ¢2,100.00 and ¢2,280.00.

The estimate using the cost of the individual diets is higher than when the family meal is prepared at a time due to the overhead costs involved in preparing individual meals. This cost, however may not be too far from being true for families which resort to obtaining individual meals from food vendors, a practice which is on the increase these days.

Discussion

The results of this study have revealed that it is possible to obtain balanced diets at the household level using cheaper varieties of local food items. A few nutrients including riboflavin, iron and niacin were lower than the recommended allowances. However, the values which met 66% or more of the recommended allowances are acceptable levels of adequacy since recommended levels for nutrients usually exceed the actual requirements of most individuals. But, it is also possible to increase or incorporate foods rich in these nutrients at additional cost when the budget can accommodate it.

The estimates of the cost of the diets suggest that at least ¢63,000.00 a month (¢2,100.00 x 30 days) is needed by a family of five of the composition given above in order to consume daily adequate meals. Since a family of five may not be typical of the average size of families in Ghana, a larger family would certainly need more money to provide adequate meals for all members.

The current minimum wage (University of Ghana and the Civil Service of Ghana) is ¢21,950.46 per month. According to the Ghana Living Standards Survey Report of 1989, as much 66% of all expenditures were on food, the proportion being highest for low income families (69.8%).

The situation since 1989 seems to have changed a great deal because it appears that the minimum wage earner now receives only enough to feed himself with little or nothing left for the family or for other expenses. The question then is whether most individuals and families even after what appears like spending all their income on food manage to obtain the dietary quality and variety they need for a healthy, productive life?

To change the situation, the low income earner needs more than three times his monthly income to feed his family and a lot more to cover the cost of other basic necessities.

Conclusion

The study has provided information which no doubt gives useful directions for planners and policy makers towards food production, distribution, pricing, determining income levels and the need to control family sizes in the country. It will be a giant step in the right direction if Ghana is to succeed in ensuring food security at the household level which is the real issue when we talk about feeding people. Low income, bordering on poverty must be seriously tackled so that levels of food consumption will improve to bring about better nutritional status for many vulnerable families in Ghana who just manage to survive.

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