In August 1965, and again in December 1967 Nutritional Status Surveys were conducted in Kisarawe district by the National Nutrition Unit. As a corollary to [illegible] a Dietary Survey was conducted in the same area in September 1968.

The dietary survey was carried out in Kidugalo village, Masaki V.D.C., a village which had been in both previous surveys and in which a monthly nutrition clinic has been functioning since the time of the first survey.

All the houses situated on the right-hand side of the main road when approaching from Dar es Salaam were involved in the Survey. This involved a total of 36 households.

A record of all food consumed in the 36 households was kept during the 7 day period Friday 20th - Thursday 26th September. Food was weighed as purchased (A.P.) before preparation, and any waste was weighed later and recorded. So that the weight of the edible portion (E.P.) was known. For any food bought in a cooked state the content of all the raw ingredients was calculated.

The age and sex of each member of the family was recorded and, in addition, the details of any guests to the house during this period. A record was kept of all meals eaten by guests and those missed by family members.

Various facts concerning background information such as food-habits and customs, agricultural practise and economy were recorded. A medical and anthropometric examination was made of all members of the survey households.

A general discription of the district can be found in the report of the 1965 survey. (Tanzania Nutrition Committee Report Series 1 B & 2 B).

The results of the dietary survey have been analysed on the basis of consumption units (for method see Kibaigwe dietary survey report. - Regional Nutrition Surveys Report No.3A).

Sources of livelihood

In a total of 36 heads of house hold involved in the survey only three were employed . Two as shop assistants and one as a labourer.

All the families, except for that of one of the shop assistants, farmed land. This was generally owned by the family themselves or by their parents. Only one family hired land.

Work on the shamba is done by the families themselves without the use of hired labour. The tools used are:- Jembe (hoe), Panga (bush-knife), Shoka (axe) and Scythe (mundu). Manure, fertilizers, insecticide and irrigation are not used.

Crops & livestock

The four major crops grown in this area are cashew nuts, coconuts, cassava and maize.

Cashew nuts have recently become the most important source of income for the people. They are sold to a local cooperative society. It is likely that over 40% of the cash income of the community is derived from sales of this crop. Another 30% appears to come from the sale of coconuts. This forming the second major source of income for the community.

As well as being an important source of income coconuts are used almost daily in food preparation.

Cassava is the main food crop and staple of the community. Because of the ease with which it can be grown and the relative ease of preparation cassava tends to be used more than maize as a staple food.

...Cont...2.

Signs and symptoms indicating adequacy of dietary protein are discussed on page 24

Food stuff	% of total-animal-protein consumed		% by weight total - proteing consumed:
Dried fish	=54.7	80.5	29.7
Dagaa	=14.9		
Dried shark	= 9.6		
Dried shrimps	= 1.3		
Beef	=13.4	18.5	6.8
Chicken	= 2.9		
Intestines	= 2.2		
Condensed milk	= 1.1		0.4

	% of total vegetable Protein consumed.
Pulses and legumes	=37.6 =23.1
Maize	=29.6 =18.7
Cassava flour & fresh	=11.8 = 7.4
Rice	=11.8 = 7.4
Bread & wheat	= 6.4 = 4.1
Other starchy roots, vegetables fruit	= 3.8 = 2.4

Food stuff	% of total reference protein contributed
Dried fish	38.2
Meat & chicken	9.6
Milk	0.6
Pulses & legumes	18.5
Maize meal	15.8
Cassava flour & fresh	4.8
Rice	7.4
Bread & wheat	3.4
Other starchy roots, veg.fruit etc.	1.8

C A L C I U M:

Average Calcuim intake per day/ c.u. = 429 mg
Maximum " " " " = 835 mg
Minimum " " " " 98 mg
Recommended intake /adult person/day = 450 mg

Average % of requirements satisfied = 89%
Maximum " " " = 183%
Minimum " " " = 22%

Number of families with an intake below 100% of that recommended =21 (i.e. 58% of the families)

The calcuim intake is, on the whole, fairly adequate. Most of the calcuim is derived from dried fish, especially dagaa, the bones of which are consumed. Cassava flour, and pulses and legumes (especially kidney beans) are also important sources of calcuim.

In the medical examination of the families involved in the survey no signs of deficiency were found.

Cont.. 15

FOODSTUFF:
Foodstuff.

Dagaa.....
Dried fish.....
&
Dried shark

Cassava flour.
" fresh.
" leaves

Kidney beans..
Cowpeas.....

Pigeon peas...
Others .....

Maize meal....
Condensed milk

Othercereals,
vegetables fru

Average iron i

Maximum .....

Minimum .....
Recommended in
Average percen

Maximum.....

Minimum .....

Number of fami
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58% of the sch

64% " " pre

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Adult Mer
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Mango, immature	5.9
Banana	2.0
Orange	1.8
Lemon	1.6
Tomato	1.6
Pawpaw	1.4
Other vegetables	2.3

25.

The above diagram page indicates the eaten percentage of the requirements for each nutrient in vestigated. This shows that although iron and vitamin C requirements are fulfilled the other nutrients fall short of the suggested minimum requirements.

Since vit. A intake varies during the year and as vitamin A can be stored in the liver a low intake at some periods in the year may not be accompained by signs of deficiency. With the coming of the mango season in November and December the vitamin A intake is likely to rise considerably.

The B vitamins, although falling short of the recommended allowances are not accompaired by clinical signs of deficiencies.

Calorie and protein intake is slightly below the recommended values.

Signs of protein calorie Malnutrition observed during clinical examination were as follows:

Percent with signs of muscle wasting:

Adult men	11 %
Adult women	4 %
School children	4 %
Preschool children	13 %

In the school children dyschromotricia was noted in 8 % of the children.

Further signs of P.C.M. in preschool-children were:

dyschromotricia	50%
moon face	4%
fisswed pinnae	4%
hepatamegaly without splenomegaly	4%

The average % of standard weight for height for men is 91 % for women it is 99 % it is possible that some of the women could have been pregnant, however this should not have increased the overall result very much as many of the women were over child bearing age so that the number likely to have been pregnant is fairly small.

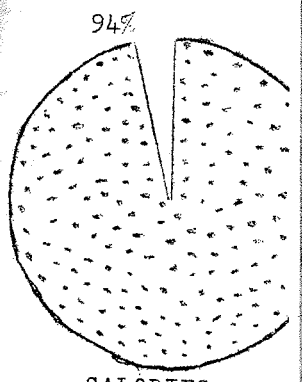
Because of the small numbers and lack of knowledge concerning age it was not possible to establish any correlation between age and weight for height.

For the preschool children weights, heights and ages were plotted against standard figurs:

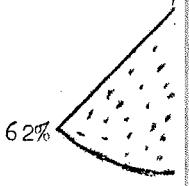
Cont.... 26

DIAGRAMS TO SI

Complete circle



CALORIES



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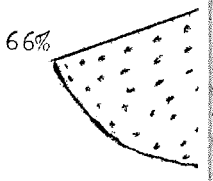

NICOTIN

Contribution by various foodstuffs to Nicotinic acid intake:

Foodstuff	Percentage of total nicotinic acid contributed:	
Cassava flour	24.8	29.4
" fresh	2.6	
" leaves	2.0	
Dried fish		17.8
Maize flour		13.8
Pulses & Legumes		12.7
Beef	8.7	12.1
Chicken	3.4	
Rice		7.4
Wheat flour, Sweet potatoes, Banana, Tea		6.8

VITAMIN C

Average intake of vitamin C per c.u per day = 31 mg
Maximum ..... =102 mg
Minimum ..... = 0 mg
Recommended intake / adult person / day ... = 20 mg

Average percentage of requirements fulfilled = 194 %
Maximum ..... = 730 %
Minimum ..... = 0%

Number of families consuming less than 100 % of their requirement = 19 (i.e. 53 % of the families).

The average family consumed nearly 200 % of their requirements for vitamin C. However, intake varies considerably from family, some having a very high intake, others on exceedingly low one:

It is likely that the vitamin C intake fluctuates with the season, and would probably be higher still a few weeks after the survey when many more fruit would have come into season.

On the whole it is the children who tend to eat the fruits rather than the adults.

During the survey the main sources of vitamin C in the diet were cassava leaves and fresh cassava. The vitamin C content of these are for the raw foods: however, the preparation of cassava leaves involves pounding and boiling for a relatively long period of time, and the loss of vitamin C in this process may well be considerable. The loss can be as high as 90 % for foods boiled open for more than 30 min.

Contribution of foodstuffs to vitamin C intake:

Foodstuff	Percentage of total vitamin C contributed by foodstuff:
Leaves	45.2 %
Cassava fresh	26.5
Sweet potatoes	11.7

Cont... .

OOL CHILDREN

965 survey
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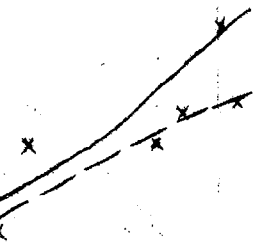

100 cms. 110 120

VARIATION IN NUTRIENT INTAKE WITH FAMILY SIZE:

For most of the nutrients there does appear to be a decrease in % of requirements fulfilled with increasing family size (see graphs on next page) except for vitamin C where there appears to be an increase in intake with increasing family size. This may be due to fruit being eaten by the children of the family, (the larger families are the ones likely to have more children in the).

Daily variation of calorie and protein intake

The chart showing variation of calorie and protein intake on the seven days of the survey reveals a slight increase in consumption on day 1, possibly an attempt to impress the observers, but perhaps because day 1 was Friday, a special day for the Moslems.

The next highest intake was recorded for Wednesday, and the lowest on Tuesday, but no reason forthis was apparent. Besides this there was little fluctuation in intake. Apart from Friday the worshiping day, there are no special funtions which involve all the villagers on the same day of the week. The market is a daily small function permanently occupying a few people and the rest are hardly affected. Infact the market is a modified shop.

COST OF LIVING.

The average value of food cost per family / week is Shs.20/90 giving an avemage of sh.4/98c per comsumption unit per week. Of this foo comparatively little comes from the shamba, most of it being bought daily from the shops, Cassava flour, fresh casaava, and all the leaves and fruit, and most of the coconuts tend to be home - grown, but some of the maize and beans are bought. All the fish and meat (except chicken), wheat flour, bread and cakes, milk, tea sugar and curry powder are bought as required.

The daily variation of cost reveals that the most costly day was saturday and the least castly Thursday. The fluctations in price are small and do not seem to c rrelate with the daily variations in calorie an protein intake.

Daily variation of cost

day	cost /c.u.
1, Friday	3/11
2, Saterday	3/31
3, Sunday	2/92
4, Monday	3/16
5, Tuesday	2/93
6, Wednesday	2/93
7, Thursday	2/54

Variation of cost with family size:

family size	cost / c.u.
2	5.36
3	4.67
4	4.81
5	4.45
6+	4.60

There does seem to be a slight decrease in cost per c.u. with increasing family size. This may be due to the fact that less food is eaten/ head in the larger families (revealed by the decrease in Nutrient intake with increase in family size)

Cont.... 30.

The average expenditure as revealed by the questionnaire is :

	Per annum Per family Shs.	Cts.
Clothes.....=	96	30
Utensils.....=	9	41
School fees for supporting - relatives.....=	30	19
	15	80
Subscriptions..=	9	98
Taxes .....=	18	44
Rent.....=	N I L	
Food .....=784	75	(gross value according to dietary analyis = 1086/80)
Alcohol.....=	N I L	
Soft drinks....=	7.	30
Other items....=	3	65
	975 .	82

The cost of living in this area is very much higher than in many parts of Tanzania, this has probably occured because of the high price commanded by cashewnuts which have brought the people sufficient money to buy their food instead of growing it themselves. This is a very negative use of the income and does not lead to an increased standard of living. Encouragement of growth of all the commonly used foodstuffs which will grow-in the area would leave the in habitants with sources to use of other projects.

In recent years there has been a definite tendancy for young people to go to the town to live and work. This has left the village with many old people who become progressively less able to fend for themselves and more reliant on money sent back from the towns. The shambas of many of these older people yield little but cassava. Incentives for the younger people to stay and / or return to the village to undertake intensive faming projects would be a great advantage to the community.

The average family has 3 meals a day, the first meal of the day consisting generally of tea with sugar and bread, mandazi, vitumbua or mkate wa kumimina. Those who can afford it have sweetened condensed milk in their tea. The average family during the week of the survey spent -

1/56	on	sugar
-/34c	on	tea
-/38c	on	bread
-/23c	on	tinned milk
-/55c	on	mandazi
-/80c	on	vitumbua
-/ 7c	on	mkate wa kumimina -
3/93c		

This gives an average of 6858 cals and 82.6g protein per family per week.

i.e. 233 cals and 2.8g protein, / c.u. / day.

The prestige value of tea in the momings appears to be an important factor, and to try to convince people that this is an unnecessary expense would be difficult. However, it may be possible, and useful to try to persuade the families to give the young children uji and dried skimmed milk instead of tea and bread etc. at no extra cost. For example:

Cont..

50g Cass
15g Suga
30g Drie
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Supply 487 c
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If the dried cassava and cocon sugar or salt.

The main wea this is fed is no to find out at wh what extent the t If as may be the some time this co is made from cass teach the parents could be a great

Up until the village has conce though some fathe survey that it is the food every-da parents would be 2% of the populat would have to tak rather than the f propose it would the fathers to ac

The attitude one of extreme ap is no attempt to Fruits grow at re to have been made Similarly with th

The most poj grow, In a numb the shamba. Fro for maize to repl greater quantiti staple with a hi Also it would sav use maize flour of pulse and legu for consumption.

Encouraging

of mchicha may b intake which is

Encourage

for not only the and Nicotnic aci

It seems th a valuable sourc the moment. It cheap local chic source for presc and easy to prep

50g Cassava flour
15g Sugar, or salt (optional)
30g Dried skimmed milk
milk of ¼ Coconut

Supply 487 cals and 12.7g protein with an NDp cals of 7.7%, and would cost less than 1/- a week.

If the dried skimmedmilk is obtained from the clinic and the cassava and coconuts homegrown the only item that has to be bought is sugar or salt.

The main weaning food appears to be uji. The extent to which this is fed is not revealed by the survey. It would be of value to find out at what age adult foods are fed to the child and to what extent the toddlers special nutritional needs are catered for. If as may be the case, children on weaning are fed uji only for some time this could be a dangerous practise especially if the uji is made from cassava flour. Work at the child welfare clinics to teach the parents more about how to feed their young children and this could be a great advantage to the society.

Up until the present time the child welfare clinic at Kidugalo village has concentrated on teaching the mothers about Nutrition, though some fathers do go along too. However, it appears from this survey that it is not the mother, but the father who chooses and buys the food every-day. Therefore an educational programme aimed at both parents would be of greater advantage to the people. Since only about 2% of the population have had any form of schooling this campaign would have to take the form of verbal and pictorial educational methods rather than the form of written work. For this purpose it would seem to be advantageous to encourage more of the fathers to accompany the mothers and children to the clinic.

The attitude towards agriculture in the village appears to be one of extreme apathy. Although the area appears to be fertile there is no attempt to harness the resources available for crop production. Fruits grow at random in the uncultivated land and no attempt appears to have been made to cultivate them intensively or plant them specially. Similarly with the main cash crop, cashew nuts.

The most popular crop is cassava which is proverbially easy to grow. In a number of families it is the only crop planted out on the shamba. From a nutritional point of view it would be advantageous for maize to replace cassava to a centain extent (or to be grown in greater quantities along with the existing cassava crop) as maize is a staple with a higher protein quality, and quantity than cassava. Also it would save people having to buy their sembe when they want to use maize flour instead of cassava flour for cooking. In addition, growing of pulse and legumes by more intensive methods would result in more for consumption. Any excess could be used as a cash crop.

Encouraging the use of fruit and vegetables and pehaps the growth of mchicha may be of importance in increasing the vitamin A & iron intake which is very low at present.

Encouragement of the use of liver occasionally would be valuable for not only the protein, but also the iron, vitamin A, riboflovin, and Nicotnic acid it would add to the diet.

It seems that encowaging the use of eggs in the diet would add a valuable source of protein, however eggs are a very expensive item at the moment. It is hoped to increase production by introducing a cheap local chicken food. At the moment eggs are the best protein source for preschool children - clean, easy to keep, produced at home and easy to prepare.

Cont....