

Part 3.

**Consumption versus acquisition
approaches for deriving food
security statistics**

Food data collected using acquisition and consumption approaches with daily diaries in Armenia's ILCS 2004

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ABSTRACT

National Statistical Service (NSS) of Armenia collected food data in the 2004 Integrated Living Conditions Survey (ILCS 2004), based on two distinct approaches: food acquisition and food consumption. Daily diaries were used to collect both the quantity and the monetary value of each food item acquired for consumption or consumed from acquisition from various food sources, recorded in separate sections of the diaries. Food acquisition consisted of all daily purchases and other daily food items acquired from non-purchased sources, such as own production in the case of perishable food, own stock, which may be piled up from production or purchases, and received free or as aid. Food consumption consisted of all food items actually used for daily consumption by the household and obtained from sources such as purchases, own stock from production or purchases, received free or as aid. The two datasets were processed and analysed separately using the FAO Food Security Statistics Module (FSSM) for deriving the same set of food security indicators at national and sub-national levels.

This paper discusses the derivation of food security statistics using the acquisition and consumption approaches, and analyses the impact of any observed differences in the two approaches on the assessment and monitoring of food deprivation at national and sub-national levels.

Keywords: food acquisition, food consumption, undernourishment, food deprivation, critical food poverty

BACKGROUND

Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. Food insecurity exists when people do not have adequate physical, social or economic access to food as defined above. Armenia's national household Integrated Living Conditions Survey (ILCS) represents an important source of data on private household consumption expenditure for assessing food insecurity at national level and for sub-national population groups.

The United Nations Statistics Division manuals on conducting household surveys indicate that food can be collected using both acquisition and consumption approaches. Food acquisition refers to food acquired by households during the household reference period, regardless of when it was actually consumed, while food consumption refers to food consumed by households during the household reference period, regardless of when it was actually acquired. International Labour Organization (ILO) resolutions on household income and expenditure surveys at the Seventeenth International Conference of Labour Statisticians in Geneva 2003 indicated the use of household surveys for the purpose of assessing food insecurity.

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National Statistical Service (NSS) of Armenia has collected food data using food acquisition and food consumption approaches since ILCS 1996. Food consumption data are useful for assessing the food security situation in the country, and food acquisition data provide inputs to national account system, among other uses.

OBJECTIVES

The main objective of this paper is to discuss any observed differences between the food security statistics derived from acquisition and those derived from consumption data. The reason for doing so is that most household surveys worldwide collect food data using the acquisition approach, on the understanding that households not acquiring food during the household reference period would be counterbalanced at national level by households reporting food acquisition, regardless of when the food is actually consumed. Many criticisms of the acquisition approach as a method of food insecurity assessment are related to the fact that high-income households have more chance of acquiring bulk amounts of food for consumption for longer periods than low-income households. Hence, it is important to understand the behaviour of food security statistics based both on food acquisition and food consumption.

METHODS AND DATA

ILCS 2004 collected food data from the separate sections of the diaries, using the food acquisition approach, requesting food purchases during the household reference period, and the consumption approach, requesting food consumption data during the same reference period. ILCS 2004 data collection took place in the period from 1 April 2004 to 31 March 2005 (shifted year). The survey was conducted with monthly rotation of households and settlements.

Armenia's NSS has developed two survey tools: a questionnaire and a diary. The questionnaire is completed by an interviewer during visits to a surveyed household within a month. During face-to-face interviews with the head of the household or another adult member, the interviewer collects information on composition and housing conditions of the household, level of education, health status and employment status of household members, landownership, availability and utilization of cattle and agricultural equipment, and other information.

The diary is completed every day for a month by the household key informant, who records all expenses on food, non-food products and services, with detailed descriptions of what was bought, such as the name of the product, its quantity, cost and place of purchase. In addition, the key informant records the consumption of products that were bought and/or received and utilized from own farms, as well as products that were received from other households. At the end of the month, information on rarely used food products is also recorded. The records in the diary are verified by the interviewer during his/her visits to the household within the same month. The sections in the diary are: 1) food products purchased during the day; 2) food consumed at home during the day; 3) food consumed outside; 4) non-food products purchased and services received; 5) all other non-food products and services received free of charge; 6) household income and revenues; 7) food that is usually consumed daily in small quantities; and 8) real estate, durable goods and ritual services.

ILCS provides a wealth of information on the welfare of households and individuals and on annual changes in the situation of poverty. A consumption aggregate is used to approximate well-being in Armenia. It is assumed that consumption is better declared and is less sensitive to short-term fluctuations than income, especially in transition countries. The consumption aggregate is estimated based on ILCS. It comprises the following components: the value of food and non-food consumption, including consumption from home production, aid received from humanitarian organizations and other sources; and the rental value of durable goods.

Food consumption includes food consumed at home and outside the household (in restaurants, etc.). Food consumed may be from purchases or from non-purchases (in-kind food consumption), as well as own food production from own farm or home garden, food received as gifts and food transfers (in-kind as food) and humanitarian food aid.

ILCS provides information on household purchases of 195 food items and on household food consumption during the 30 days of the household reference period. The ILCS reference period is annual. In order to express food consumption in monetary values, the estimated prices of purchased items are used. The information collected on household food purchases includes the value, quantity, unit of measurement and location of purchase. Using the value and (standardized) quantities, unit values for all items at the household level are estimated.

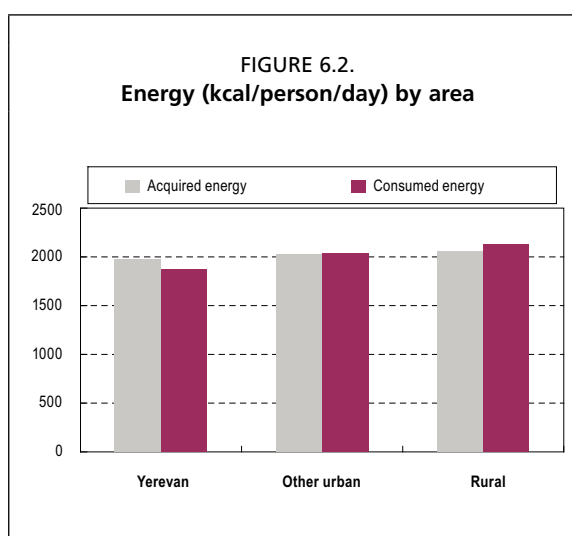
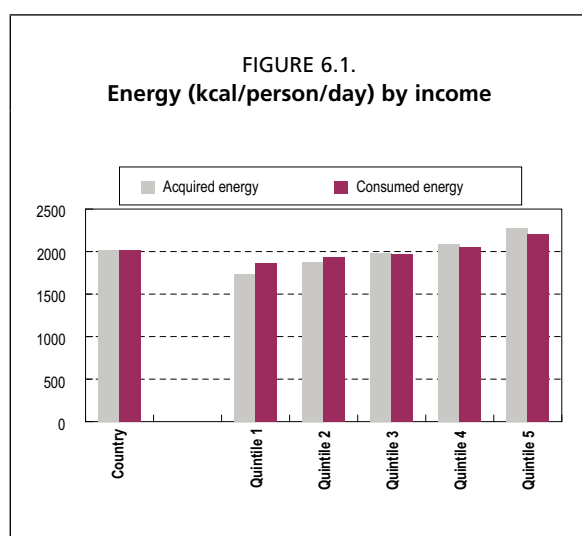
Total country expenditures on food are obtained by summing household expenditures for all households in the sample. Household expenditures on all food items are calculated using the value of every food item purchased for each household (including imputed consumption in kind, i.e., food consumption that is not purchased, received as gifts and humanitarian aid). The average cost of one calorie in Armenia is calculated by dividing total country expenditure on food by total country calorie consumption.

FOOD SECURITY STATISTICS FROM ILCS 2004

Food security statistics using the acquisition and consumption approaches at national and sub-national levels regarded dietary energy value, monetary value and energy unit value, inequality in access to food due to income, share of food in total consumption, food deprivation, and critical food poverty. These estimates were derived from food data provided by households and recorded in separate sections to facilitate the necessary calculations using the acquisition and consumption approaches.

Dietary energy

The estimates of dietary energy using food data based on acquisition or consumption at the country level were the same in quantity, at 2020 kcal/person/day. However, households in the two lowest income quintiles registered less energy from acquired than consumed food quantities. The contrary - more energy from acquired than consumed food - was observed in households of the two highest income quintiles (Figure 6.1). The differences were higher in low-income than high-income households, and sampling weights balanced both estimates at the country level.

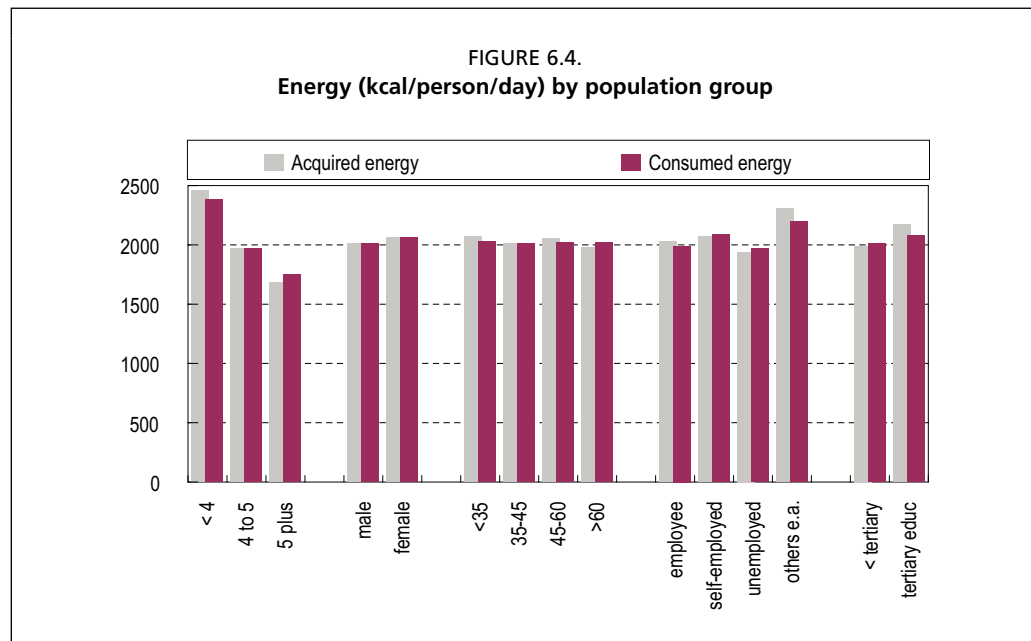
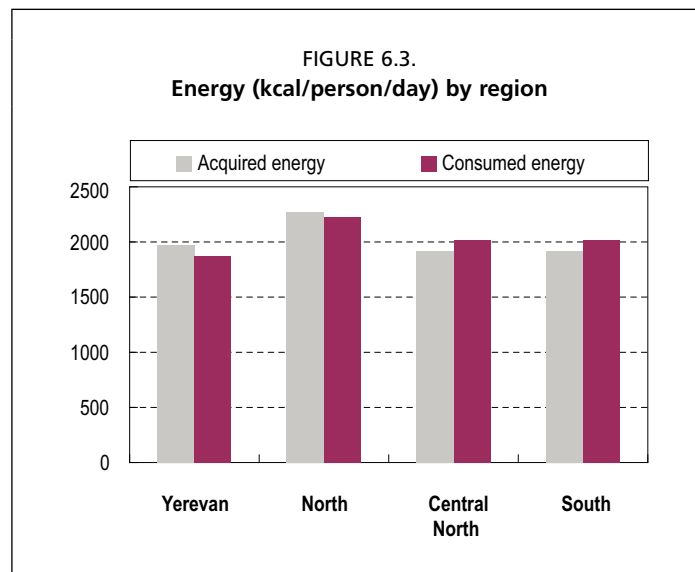


Households in rural areas registered less energy from acquired than consumed food, while households in Yerevan registered more energy from acquired than consumed food (Figure 6.2).

Households in the South and Central-North regions registered less energy from acquired than consumed food quantities, while those in the North region registered more acquired energy than consumed energy (Figure 6.3). These results compensate estimates among regions and national-level estimates of dietary energy using both consumption and acquisition.

Large size households, with older, unemployed or less educated heads registered less energy using the acquisition approach than from the estimates derived using the consumption approach (Figure 6.4).

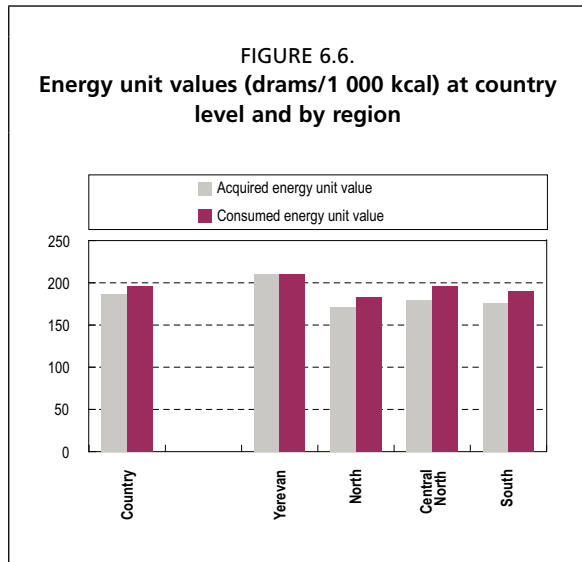
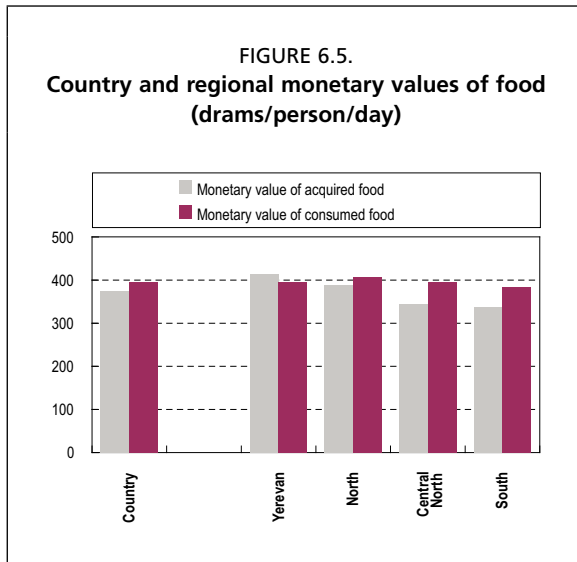
No difference was observed between acquisition and consumption estimates of energy according to gender of household head.



In Armenia, the use of energy acquired rather than energy consumed would result in overestimation of food deprivation in low-income groups, rural areas and South and Central-North regions, among others, while underestimation would result in high-income groups, such as in Yerevan.

Monetary value of food and energy unit value

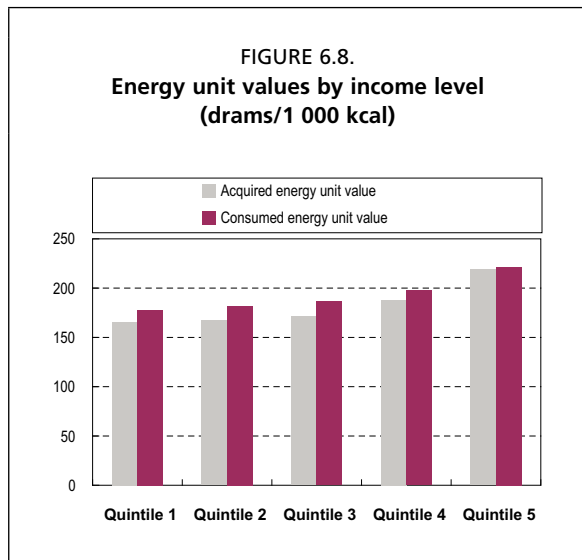
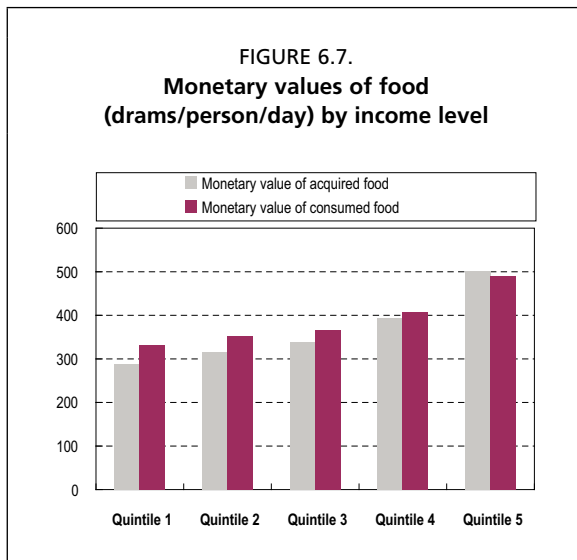
At country level, the monetary value of food was lower using the acquisition than the consumption approach (Figure 6.5).



Consequently, the acquired energy unit value (drams/1000 kcal) was lower than the consumed energy unit value, because the amounts of energy (kcal/person/day) were similar in both acquisition and consumption approaches (Figure 6.6).

This difference was mainly due to households in Yerevan reporting higher unit monetary values from acquisition than from consumption (Figure 6.5), even when consumption unit values were priced from purchases in other regions.

Households at the highest income level reported higher acquired than consumed monetary food values, while the opposite was observed in the other income levels (Figure 6.7). Energy unit value as food acquisition was lower than as food consumption for all income levels, with the difference increasing in low income levels (Figure 6.8).

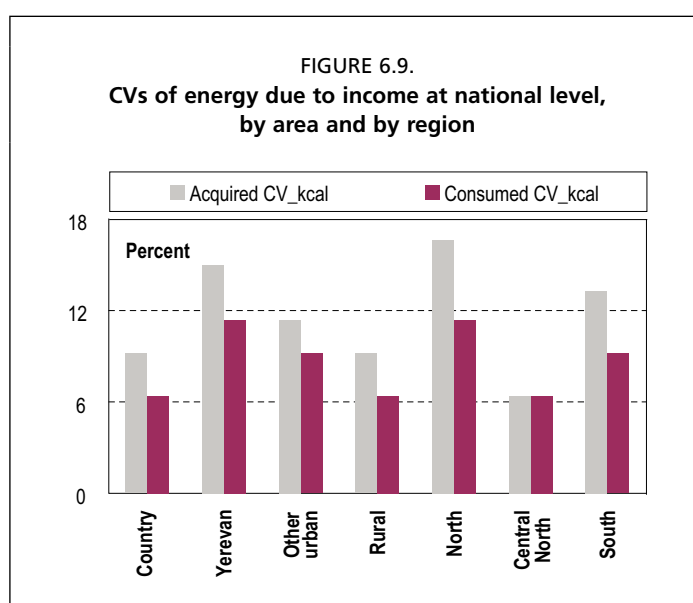


In assessing critical food poverty, if higher energy unit values from consumption data were used, then the critical food poverty line (cost of MDER) would increase compared with that based on acquisition data.

Inequality in access to food due to income

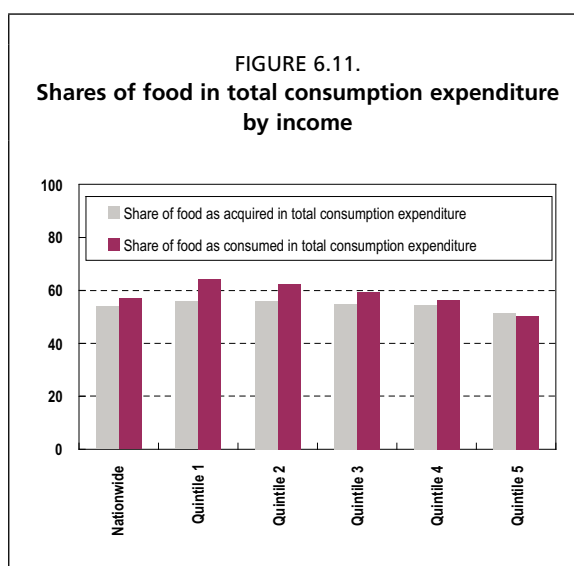
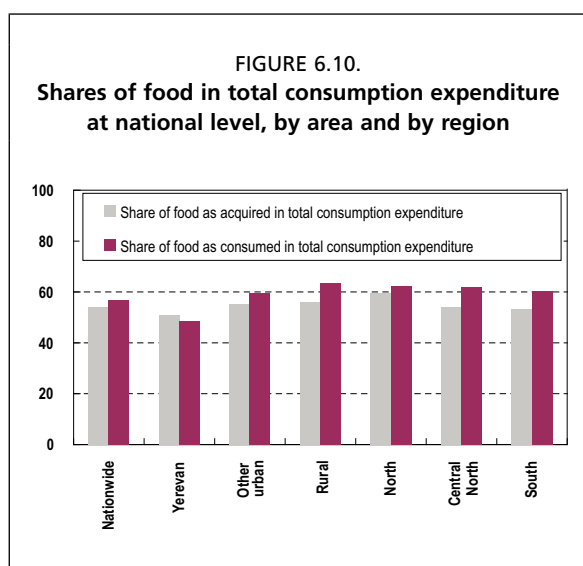
The inequality in access to food measured as the coefficient of variation (CV) of energy due to income based on food acquisition was higher than that based on food consumption, at country level and for all population sub-groups, except in Central-North region, where the two approaches yielded the same value (Figure 6.9).

With the exception of Central-North region, the consequence of higher inequality in access to food in all population groups would be a higher estimate for the prevalence of food deprivation. This would be true if food acquisition data were used, keeping the other parameters fixed in all these population groups.



Share of food in total consumption

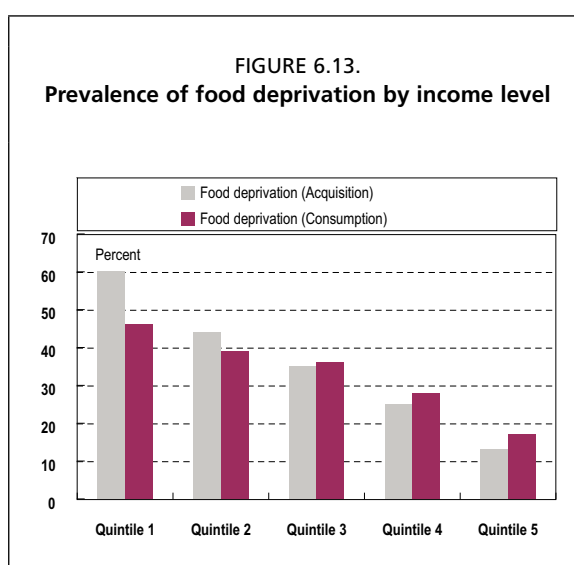
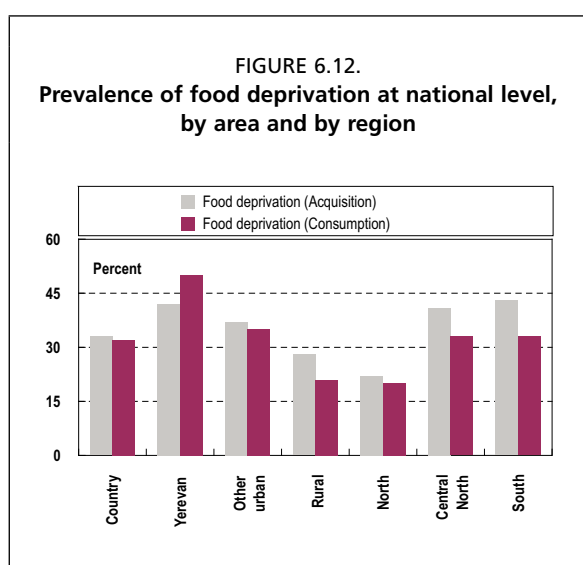
The shares of food monetary value to total consumption expenditure (Engel ratios) were higher using data on food consumption than on food acquisition data, except in Yerevan. The country results reflected the same pattern of difference as in the regions. The Yerevan overestimate was small. Urban and rural populations showed similar patterns to national level (Figure 6.10). Engel ratios were higher using data on consumption in all quintiles, except the highest (Figure 6.11). Given that the purpose of the food insecurity assessment is to achieve estimates of food deprivation, it is clear that using food data based on acquisition would yield underestimates of Engel ratios.



These findings are based on food monetary values; if the food insecurity analyses were instead based on the Engel ratios and food monetary values from food data on acquisition, the results would underestimate the importance of income devoted to food in low-income households.

Food deprivation

Given that the different estimates of access to food due to income, in both the acquisition and the consumption approaches, reported the same energy quantity, the prevalence of food deprivation (using acquisition) would be higher at country level (Figure 6.12). However, in the North region, a lower acquired than consumed energy quantity would yield higher food deprivation, as the inequality in access to food would be the same.

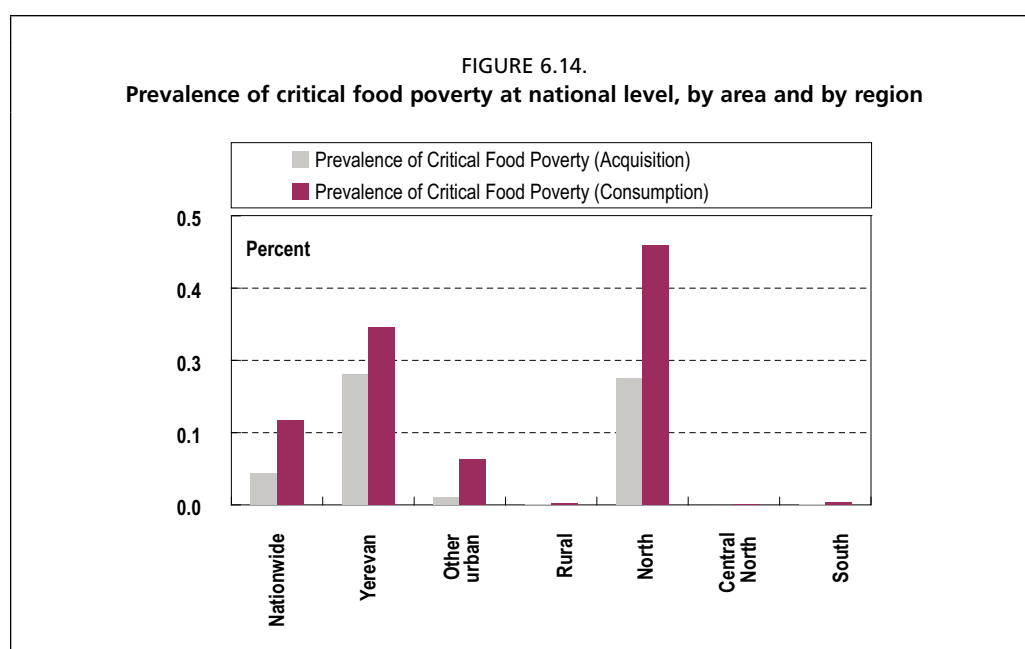


It is important to note that the results on food deprivation show an opposite trend compared with the Engel ratios, particularly in low-income households, that is, the acquisition approach would underestimate the Engel ratio and overestimate the prevalence of food deprivation. A similar pattern was observed for all household income levels.

As inequality in access to food due to income within a quintile is null, prevalence of food deprivation results only from differences in energy quantities. Therefore, for the first two quintiles, food deprivation would be higher using acquisition than using consumption, as food acquired was lower than food consumed for these two quintiles. The reverse is observed for the three highest income quintiles (Figure 6.13).

Critical food poverty

Even though critical food poverty was very low in Armenia (Figure 6.14), the fact that the acquired energy unit value was lower than the consumed energy unit value means that the food acquisition approach would yield a lower critical poverty line, resulting in a lower prevalence of critical food poverty than when using the food consumption approach.



CONCLUSION AND REMARKS

For the purpose of food insecurity assessment, it is important to consider collecting food data using the consumption approach.

For the purpose of national accounts, it is important to consider using the acquisition approach.

If food acquisition had been used instead of food consumption, even if the energy quantities were the same at country level, food deprivation at national level would have been slightly overestimated, at 33 versus 32 percent; however the over and underestimation for sub-national population groups would have been higher. For non-geographical population groups, food deprivation derived using the acquisition approach would yield overestimates in low-income groups and underestimates in high-income groups, for example.

The increase in food deprivation resulting from using acquisition rather than consumption would be due to an overestimation of the CV of energy due to income, of nine versus six percent.

The decrease in critical food poverty is driven by the lower energy unit value obtained from using acquisition rather than from using consumption. At sub-national levels, the overestimation would be of even greater magnitude in geographical population groups.

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Food data collected using acquisition and consumption approaches with a seven-day recall method in Kenya's KIHBS 2005/2006

Josiah Kaara and Seevalingum Ramasawmy¹⁷

ABSTRACT

The Kenya National Bureau of Statistics (KNBS) collected food data in the 2005/2006 Kenya Integrated Household Budget Survey (KIHBS 2005/06) based on two distinct approaches: food acquisition and food consumption. A seven-day recall questionnaire collected the monetary and quantity values of food purchases during a seven-day period. The questionnaire also collected the quantities of consumed food obtained from purchases, own production, own purchased stocks, received free, etc. Food details were available for 154 food items, including those consumed away from home. The two sets of data were processed and analysed separately using the Food Security Statistics Module (FSSM) to derive the same set of food security indicators at national and sub-national levels.

This paper discusses the derivation of food security statistics using the acquisition and consumption approaches and analyses the impact of any observed differences in the two approaches on the assessment and monitoring of food deprivation at national and sub-national levels.

Keywords: food acquisition, food consumption, undernourishment, food deprivation, critical food poverty

BACKGROUND

The Kenyan economy enjoys relatively advanced agricultural and industrial sectors and substantial foreign exchange earnings from agricultural exports and tourism. After decades of low economic growth, Kenya has seen economic recovery since 2003, registering about 6.1 percent growth in gross domestic product (GDP) in 2006. In monetary value, the main agricultural products are tea, coffee, sugar cane, horticultural products, maize, wheat, rice, sisal, pineapples, pyrethrum, dairy products, meat and meat products, hides and skins, which represent 16 percent of national GDP. The majority of Kenya's land is arid or semi-arid and is home to pastoral and nomadic people living on the margins of subsistence. The country lacks robust food production and is vulnerable to unstable rain patterns, which greatly affected food production in 2005/2006. Subsistence farming is very high in rural Kenya, and probably the primary source of livelihood for about 70 percent of women in rural areas. Although the poorest of the poor are found in sparsely populated arid zones, mainly in the north of the country, more than 80 percent of rural poor people live in higher-potential areas around Lake Victoria and in Mount Kenya region.

More than half of the country's estimated 36 million people live in rural areas where there are high proportions of poor people with low standards of living and

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limited access to social services. Almost 75 percent of the Kenyan labour force is in the agriculture sector. Poverty remains an enormous challenge for Kenya, and progress towards hunger reduction is a major policy issue and a government priority.

OBJECTIVES, METHODS AND DATA

KIHBS 2005/2006 collected household food acquisition and consumption data, which allowed the derivation of food security statistics at national and sub-national levels using the FAO FSSM methodological approach. This analysis compares these two sets of estimates of food security indicators and evaluates the best possible use of them for the assessment and monitoring of food deprivation in Kenya.

KIHBS 2005/2006 is one of the most comprehensive budget surveys ever conducted in Kenya. Its sample design is based on the sampling frame from the 1999 Population and Housing Census. KIHBS selected survey clusters from a pool of 540 urban and 1240 rural clusters, and took place over a 12-month period on a sample of 13430 households. The randomizing of visits to selected clusters within each district throughout the year permitted the capture of seasonal effects on food consumption estimates.

The ten households selected in each cluster were each visited only once during the year. The aim of the survey instruments was to capture the total annual consumption, expenditure and income of each household, by combining the factual observation of food consumption (and some other frequent expenses) using two-week diaries, and the purchases of other items by recall, with reference periods ranging from three to 12 months. At the beginning of the survey, recall permitted the capture of food consumption over the previous seven days. It was intended that the combination of both methodologies would provide the necessary empirical basis for their comparison, and provide the basis for the formulation of simplified survey instruments for poverty monitoring in the future.

The survey collected food details according to the food acquisition and consumption approaches in section I of the main KIHBS questionnaire for the previous seven days. Food acquisition consisted of all daily purchases and other daily food items acquired from non-purchased sources, such as own production, own stock from production or purchases, received free or as aid. Food consumption consisted of all food items actually consumed daily in households, from acquisitions recorded as purchases own stock from production or purchases, received free or as aid, etc. FSSM processed and analysed the two sets of data separately to derive one set of food security indicators at national and sub-national levels.

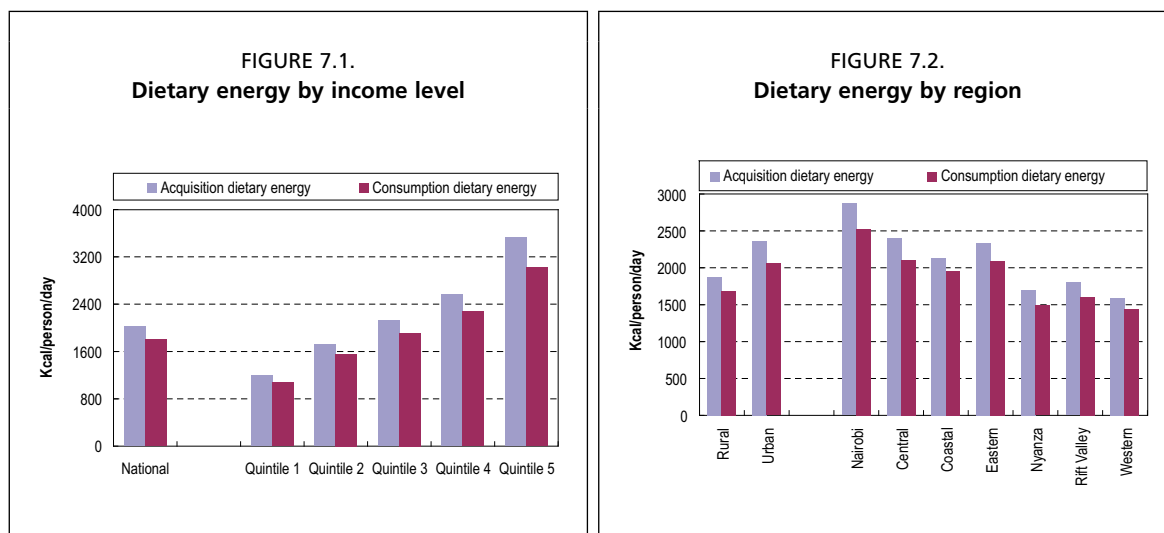
FOOD SECURITY STATISTICS FROM KIHBS 2005/2006

The food security statistics obtained by the acquisition and consumption approaches at national and sub-national levels were: dietary energy value and relative food sources, monetary expenses, dietary energy unit value, inequality in access to food due to income, food deprivation, critical food poverty, and diet diversity.

Dietary energy

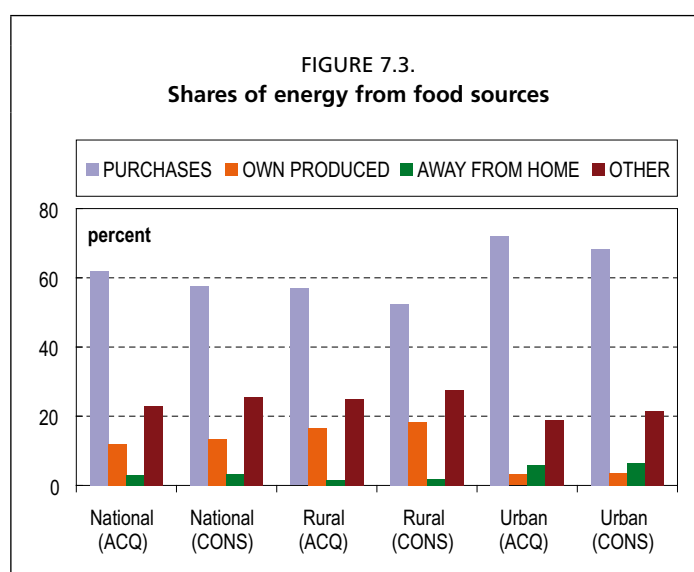
At national level, average daily dietary energy acquired per person was about 12 percent higher than that consumed. All population groupings showed higher acquired than consumed dietary energy (Figures 7.1 and 7.2).

Acquired energy in the lowest income group was ten percent lower than consumed energy. The highest-income population acquired 17 percent more energy than it consumed. The highest levels of acquired and consumed dietary energy were among populations in Nairobi and other urban areas and in Central and Eastern regions. The differences between acquired and consumed energy ranged from nine to 15 percent.



The difference between acquired and consumed energy lies in the purchases of food items (Figure 7.3). The higher acquired than consumed energy may reflect the energy acquired for stock or to give away to other people. The questionnaire did not collect information that differentiated between these issues. Purchase was the main dietary energy source, representing about 62 percent of total acquired dietary energy and 58 percent of that consumed at national level. Energy purchases under the acquisition approach were always higher than those under the consumption approach, at national and sub-national levels, but the differences varied in magnitude. The share of own production dietary energy was higher in consumed than acquired dietary energy, however.

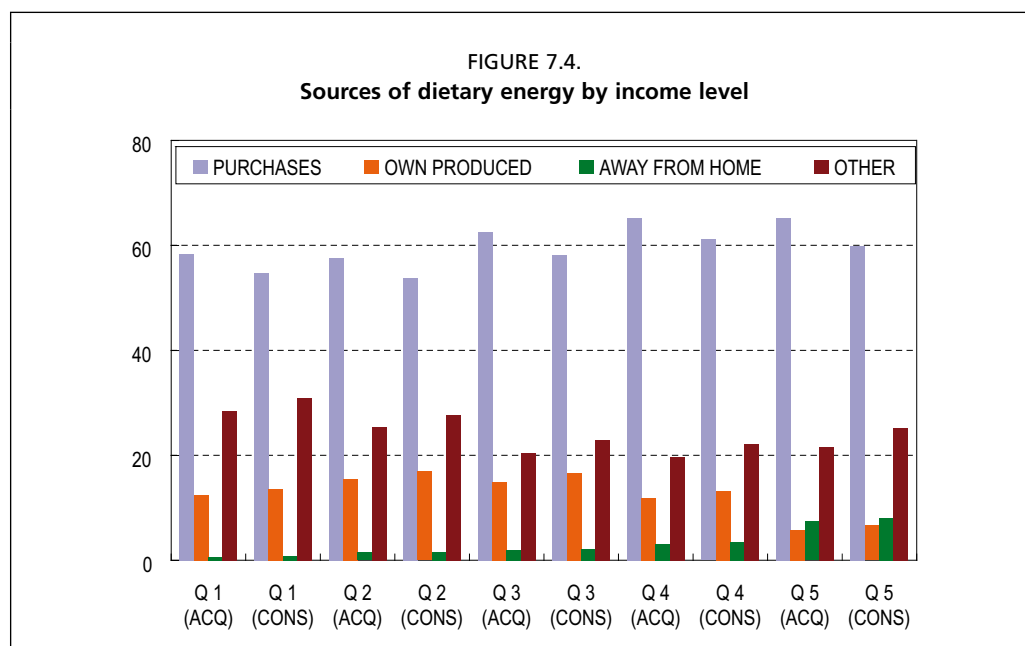
The other sources of dietary energy showed the same pattern, mainly from own food stock or received free. Away-from-home food was significant in urban areas only. The share of away-from-home food was highest in Nairobi, owing to the availability of a large number of restaurants, street vendors, snack shops and food courts. The population of the lowest income quintile had the highest dietary energy from other sources, probably food aid or received as payment at workplaces.



Away-from-home dietary energy had the same percentage contribution to both acquired and consumed energy, and had high levels for income quintiles four and five. Away-from-home energy was insignificant for the two lowest income groups.

Figure 7.4 gives the comparative contributions of the four sources of dietary energy, by income level, for both approaches.

Purchases acquired were always higher than those consumed at all income levels. The highest income level also had the highest share of purchased dietary energy.



Away-from-home dietary energy was usually available only among the populations of the fourth and fifth income quintiles. Purchased acquisition of away-from-home food was similar to consumption. The two other food sources - own production and other sources - had higher shares of consumed than acquired dietary energy. Their levels were more significant among the populations of the three lowest income groups.

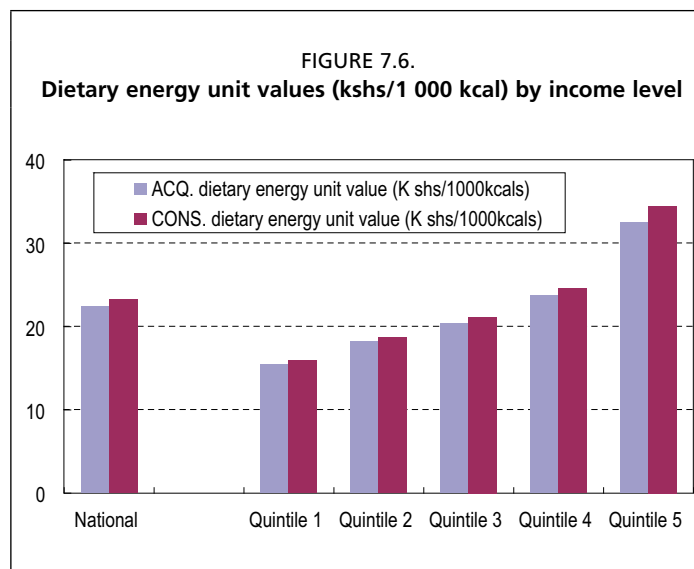
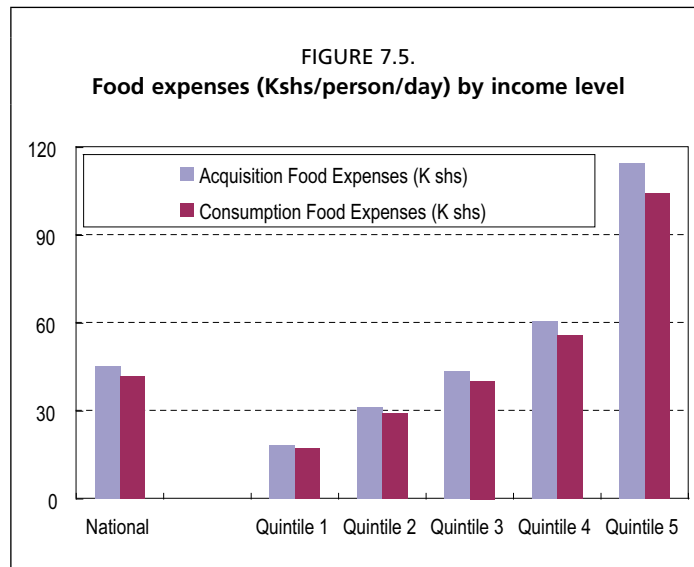
Monetary expenses and unit values of dietary energy

The average daily per person food expense at national level was 45.23 Kenyan shillings (Kshs) using acquisition, compared with Kshs 41.73 using consumption (Figure 7.5).

Households in the highest income quintile had the highest monetary expenditure for both acquisition (Kshs 114.71) and consumption (Kshs 104.33). The high-income population group usually bought more expensive food and in bulk, either for food stock or to give to other people such as workers or guests. On average, this group's food expenditure was more than six times that of the lowest-income population, in both the acquisition and the consumption approaches.

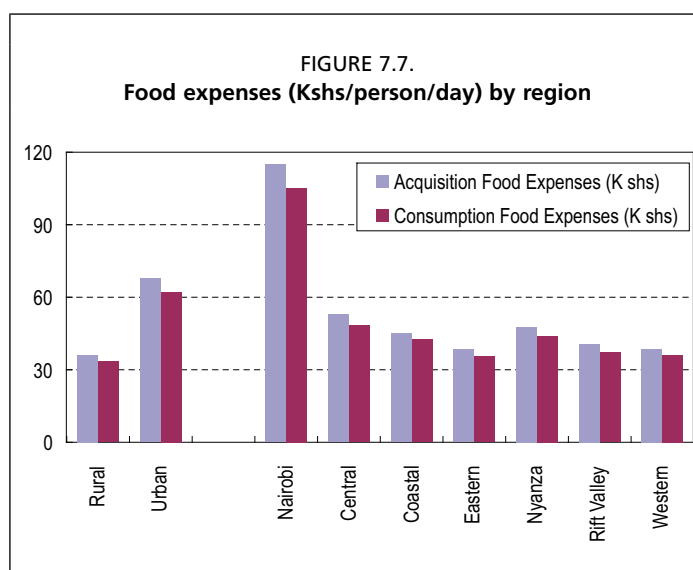
The dietary energy unit value gives a different picture (Figure 7.6). The dietary unit value from consumption was higher than that from acquisition at national level and at all income levels.

Dietary energy unit value increased with increasing level of income, with the highest-income population groups paying more than twice what the low-income population paid, in both consumption and acquisition. High-income groups paid six percent more for consumed energy.

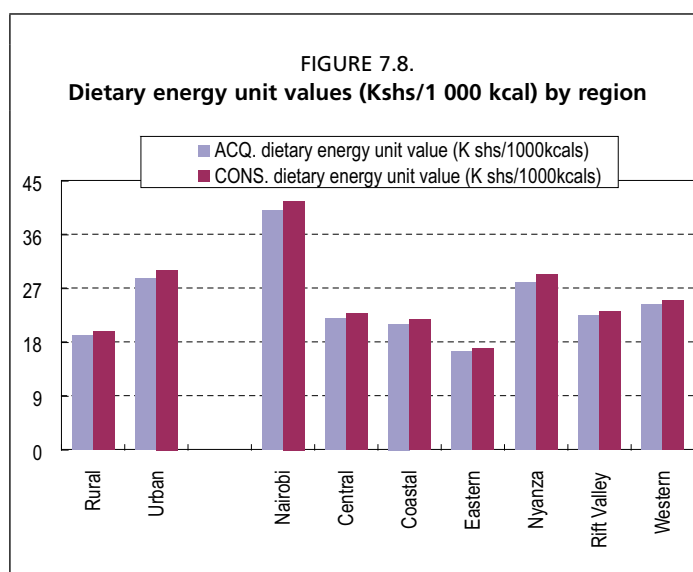


Food expenses were by far the highest, using both acquisition and consumption, in Nairobi and, to a lesser extent, in other urban areas (Figure 7.7). Rural areas and the Eastern region had the lowest food expenses, at less than Kshs 40/person/day.

The food expenditure of Nairobi's population was almost three times that of the population in rural areas. This could be owing to the high dietary energy unit value in Nairobi (Figure 7.8) and the low income level of the rural population.



The dietary energy unit value of consumption was higher than that of acquisition for all areas and regions (Figure 7.8).



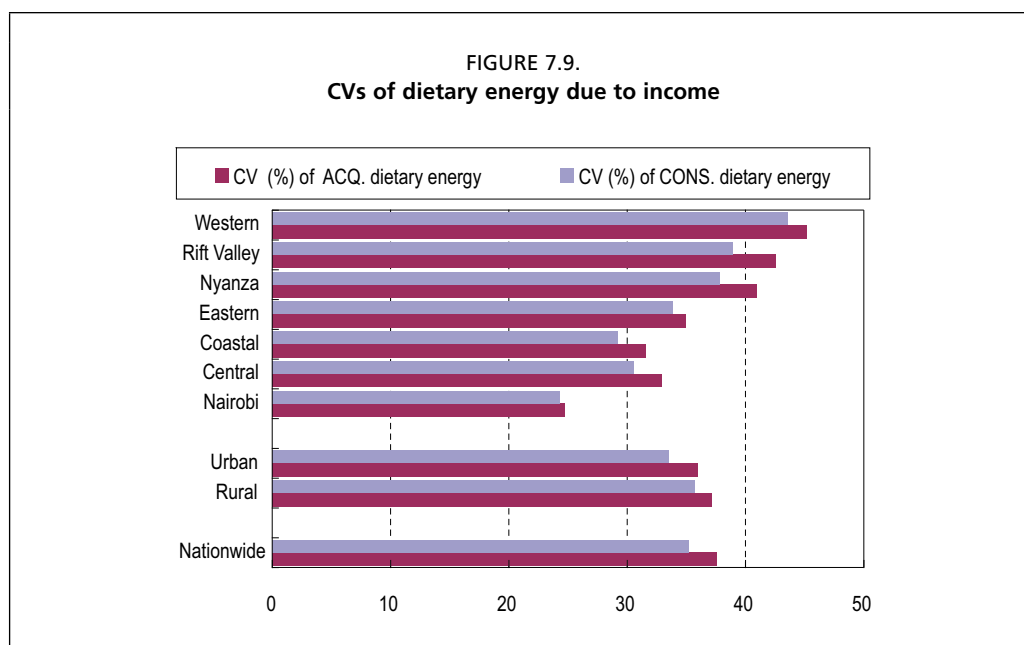
Nairobi and other urban areas showed high dietary energy values, as did rural areas and the Nyanza region. The Eastern region had the lowest dietary energy unit values, indicating that food prices were low in that region because it is a food producing region. The observed higher unit value of consumed compared with acquired dietary energy was probably due to the estimation procedures used to value all consumed food quantities.

KIHBS 2005/2006 collected monetary values of purchased food quantities only. All consumed quantities were valued using available purchased unit food prices at levels other than the household, sometimes using regional and national prices. Energy unit values would increase the critical food poverty line (the cost of the minimum dietary energy requirement - MDER) when assessing critical food poverty using acquisition or consumption, as described in the section on critical food poverty.

Inequality in access to food due to income

Inequality in access to food as measured by the coefficient of variation (CV) of energy due to income was higher at country level and for all population groupings under the acquisition approach (Figure 7.9). Inequality in Kenya remains high, with CVs of 37.5 and 35.2 percent using the acquisition and consumption approaches, respectively, except in Nairobi. Nairobi had the lowest inequality in access to food due to income, at 24.7 and 24.3 percent using acquisition and consumption, respectively. The Western region registered the highest corresponding CVs at 45.2 and 43.6 percent.

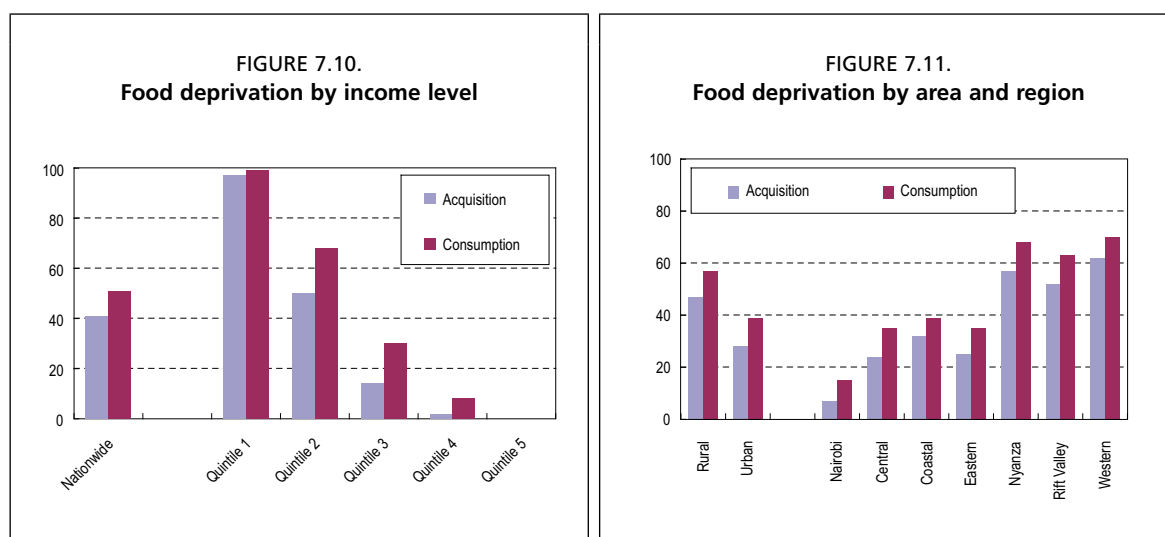
These inflated CVs reflect the effect of under-reporting of food consumed by low-income households and over-reporting by high-income households, which give away prepared food in rural regions. The questionnaire did not record food given to non-household members such as workers and visitors in high-income households; neither did it record food received by household members as payment in the case of workers, and it probably under-reported food eaten away from home as non-purchased food.



The higher inequality in access to food, by an average of about three percentage points, using the acquisition approach would marginally overestimate the prevalence of food deprivation for all the population groups.

Food deprivation

At national level, the prevalence of undernourishment was 51 percent, based on consumption data, and 41 percent based on acquisition data. Figure 7.10 shows the variations among income levels and Figure 7.11 those among areas and regions.



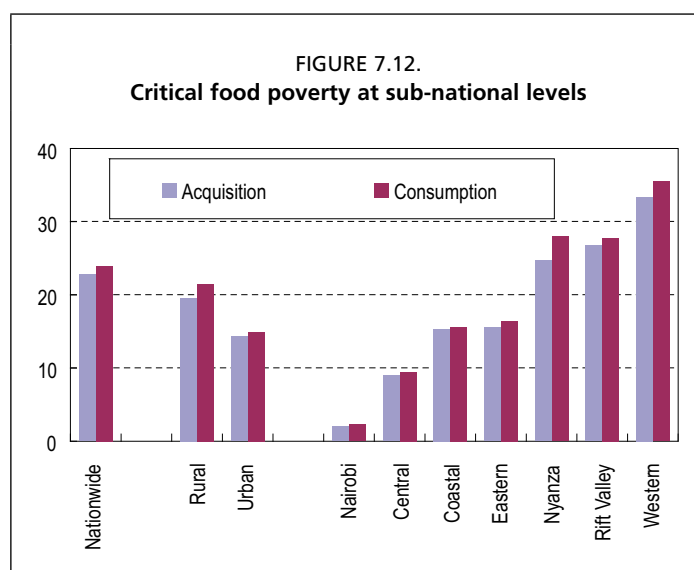
It is well-known that prevalence of food deprivation is higher with higher levels of inequality in access to food and is lower with higher levels of dietary energy. In this study it was found that despite the higher inequality in access to food, food deprivation was lower and this is because the dietary energy estimates using food acquisition dominated over the effect of higher inequality in access to food. On the other hand, the lower inequality in access to food and dietary energy estimates using food consumption yielded a higher prevalence of food deprivation, and this is because, the effect of lower dietary energy dominated over the effect of lower inequality in access to food. Consequently the magnitude of food deprivation would be under-estimated if food acquisition were used.

The differences in the two sets of food deprivation estimates differed by region owing to the magnitude of inequalities. Food deprivation estimates using acquired food data would be underestimated owing to lower inequality estimates.

Critical food poverty

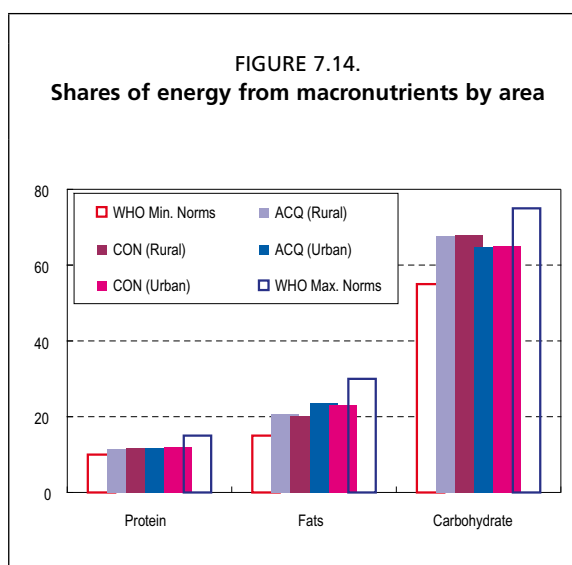
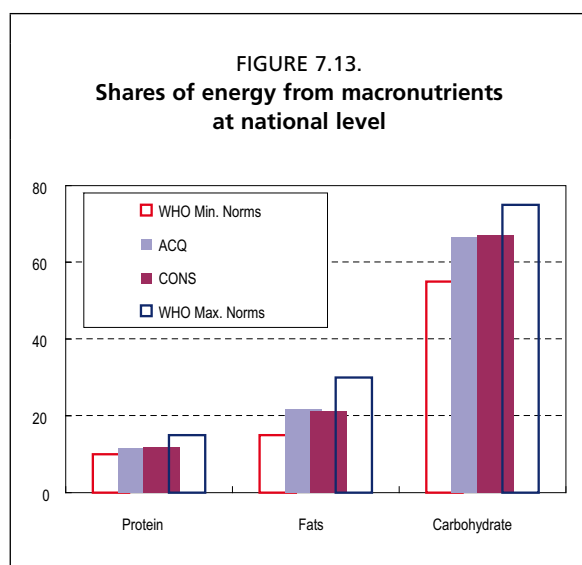
Critical food poverty is the lack of income to acquire a balanced MDER. Figure 7.12 gives the prevalence of critical poverty at national and sub-national levels.

Critical food poverty estimates using acquired dietary unit values were marginally lower for all population groupings than those based on consumed dietary unit values. Nairobi and the Coastal region had the lowest differences, and the highest was in Nyanza. High consumed dietary energy unit values probably led to overestimation of critical food poverty, given that consumed monetary values were derived from purchased unit prices.



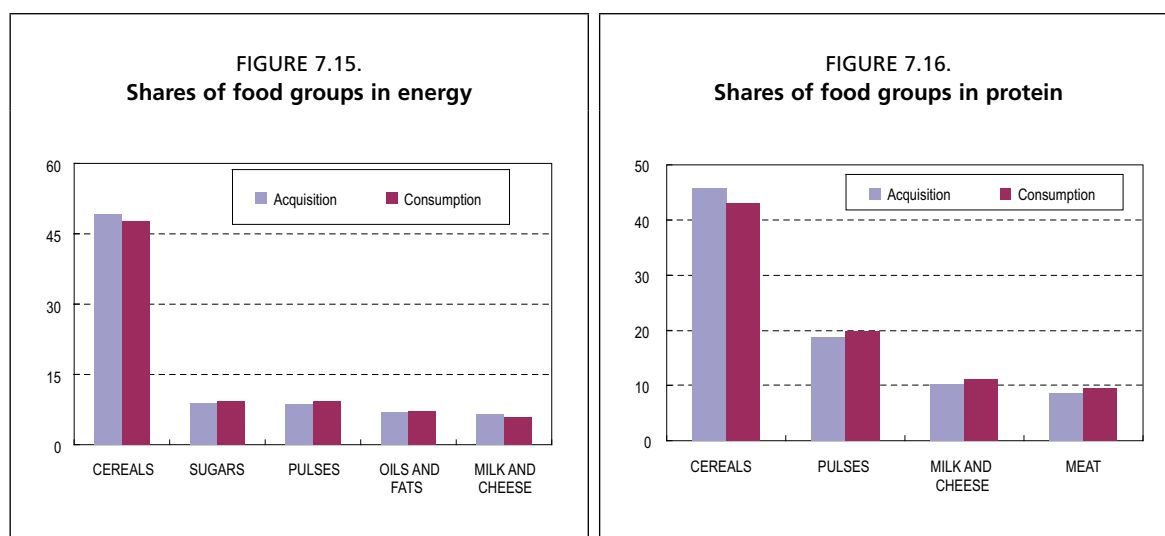
Diet diversity

The diet diversity using acquired and consumed dietary energy for national and sub-national levels showed that Kenyans consumed a relatively nutrient-balanced diet, as the shares of proteins, fats and carbohydrates in total consumption were within the WHO norms. Differences between the estimates derived from the two approaches were not significant at national level (Figure 7.13).



The two approaches showed some differences between rural and urban populations for fats and carbohydrates (Figure 7.14). Fats were lower using consumption data than using acquisition, in both rural and urban areas. However, carbohydrates consumed were higher than those acquired in both areas. Cereals and cereal products was the main food group, contributing about 48 and 50 percent, respectively, of consumed and acquired energy. Figure 7.15 compares the shares of the main food item groups, which contributed about 80 percent of dietary energy as estimated by the acquisition and consumption approaches. Consumption recorded higher energy shares than acquisition for sugar and pulses. Acquisition energy data for milk and cheese food items were higher than those for consumption. For protein consumption (Figure 7.16), cereals were the major contributor using both acquisition

and consumption, but the latter gave them a lower share. This could be owing to the perennial nature of these food items. The protein shares of pulses, milk and cheese and meat products were higher from consumption than acquisition.



CONCLUSION AND REMARKS

Analysis of the acquisition and consumption food data of KIHBS 2005/2006 revealed some advantages in the use of consumption data instead of acquisition data for the assessment of food security at national and sub-national levels:

- Food consumption data provide better measures, on average, of food security statistics. Food consumption dietary energy estimates are more consistent and can easily approximate dietary energy intake, which is usually appropriate for assessing undernourishment.
- The measures of access to food, particularly regarding food dietary energy, derived from consumption data are more consistent.
- Food acquisition may be used more for policy and planning purposes than for assessing food deprivation.

The main recommendation is to collect monetary values of all food quantities, particularly those related to consumption, at household or local level. There are large differentials in both quantity units of measurement and prices, which have an impact on food security estimates. The NHS questionnaires can easily collect data using both acquisition and consumption, complemented with additional data on household food consumption received and given away.

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Food data collected using acquisition and intake approaches in Cape Verde's IDRF 2001/2002

Clodomir Pereira, Nathalie Troubat and Ricardo Sibrian¹⁸

ABSTRACT

National Statistics Institute (*Instituto Nacional de Estatística* - INE) of Cape Verde conducted the Household Expenditure and Income Survey (*Inquérito Às Despesas e Receitas Familiares* - IDRF) 2001/2002 at national level. IDRF collected food consumption data from a sample of 4550 households on a monthly basis for a period of 12 months (October 2001 to October 2002), to account for seasonal variations, with a two-week household reference period. IDRF 2001/2002 provided detailed information of food acquired from purchases, own production, away-from-home consumption and other sources for 478 food products, in both quantity and monetary values, using diaries. Data on food consumed away from home were collected using individual questionnaires. IDRF 2001/2002 collected food intake data from a sub-sample of 2075 households using a specially designed questionnaire for a one-week household reference period. The questionnaire collected quantity data on intake; the corresponding monetary values were based on the unit values of food items from the main IDRF. The FAO Food Security Statistics Module (FSSM) estimated acquisition and intake food data to derive food security statistics at national level and sub-national levels.

This paper presents comparative results of the food security statistics derived from food acquisition and intake data, and further analysis of food security statistics at sub-national level based on intake data.

Keywords: food acquisition, food intake, undernourishment, food deprivation, critical food poverty

BACKGROUND

The United Nations Statistics Division manuals on conducting household surveys indicate that food data can be collected by using both acquisition (economic consumption) and intake (nutritional consumption) approaches. Food acquisition refers to food acquisition by households during the household reference period, regardless of when food consumption actually occurred. Food intake refers to food consumption by households during the household reference period, regardless of when food acquisition actually occurred. While acquisition data are useful for deriving inputs to national account system relating to food, intake data are useful for deriving food security indicators.

The Seventeenth International Conference of Labour Statisticians in Geneva 2003 issued resolutions on the use of household income and expenditure surveys for the purpose of assessing food insecurity.

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OBJECTIVES, METHODS AND DATA

The main objective of this paper is to discuss differences between acquisition-based and intake-based food security statistics. The reason for such a discussion is that most household surveys worldwide collect food acquisition data, but very few collect intake or consumption data. Many critics of acquisition data feel that they lack empirical evidence from household surveys that collect food and income or total expenditure data.

The Cape Verde Survey of Household Expenditure and Income (IDRF) 2001/2002 provides a unique opportunity to estimate food security statistics derived from food data based on acquisition and intake. National Institute of Statistics (INE) of Cape Verde collected food data in IDRF 2001/2002 based on two distinct approaches: food acquisition, and food intake from a sub-sample of households. Daily diaries collected both the quantity and the monetary value of each food item acquired for human consumption in all sampled households, while food intake refers to quantity values taken from a subset of sampled households.

Food acquisition, which is consumption from the economic point of view, consisted of all the food purchases and other food items acquired from non-purchased sources, such as own production, own stock from production or purchases, and received free or as aid, during a two-week household reference period. Food intake, which is consumption from the nutritional point of view, consisted of all the food items actually used for consumption by the household and obtained from such sources as purchases, own stock from production or purchases, and received free or as aid during a one-week household reference period in a sub-sample of households.

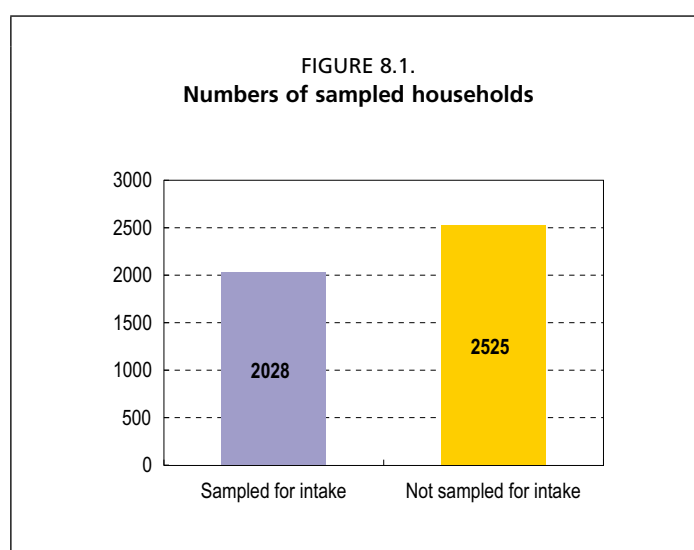
IDRF 2001/2002 collected food data from October 2001 to October 2002. The survey rotated sampled households on a monthly basis. INE developed several questionnaires for collecting household food intake and acquisition data on at-home consumption and away-from-home consumption by household members. Interviewers completed the questionnaires during visits to surveyed households during a two-week period.

Every day, the household key informant recorded all expenses on food, non-food products and services, with details such as the name of the product, its quantity, cost and the place of purchase. The interviewer verified the records in the diary during his/her visits to the household during the same month, using sections on purchasing food products for food consumption at home during the day, food consumption outside, purchasing of non-food products and services, all other free-of-charge non-food products and services, and household total expenditure.

The datasets on intake and acquisition were processed using the FAO Food Security Statistics Module (FSSM), and analysed separately. FSSM was implemented across all the sample households using estimated intakes, based on estimated urban-rural differentials derived from a study on intake and acquisition from the sub-sampled households.

STUDY OF INTAKE VERSUS ACQUISITION

Intake and acquisition of food were measured in a sub-sample of IDRF2001/2002. Figure 8.1 shows the number of sampled households in each group. The first group measured intake for one week and acquisition for two weeks, and the second group measured only acquisition for two weeks. There were fewer households in the first group because of non-responses. It seems that there was selection bias in sampling households for the collection of intake data.



IDRF provides a wealth of information on the welfare of households and individuals and on annual changes to the poverty situation. A total expenditure aggregate approximated well-being in Cape Verde. The households selected for intake and acquisition data collection had lower total expenditure than non-selected households (Figure 8.2). It is important to note that the expenditure inequality was lower among selected than non-selected households and that selected households had more members than non-selected households.

Figure 8.3 shows how the dietary energy level in households sampled was lower for acquisition than for intake by almost 200 kcal/person/day. Acquired energy in non-sampled households was higher than in sampled households, by more than 250 kcal/person/day; this difference may be linked to the higher total expenditure as shown in Figure 8.2. Probably, if all households sampled in IDRF 2001/2002 had had their intakes measured, their dietary energy would have been higher.

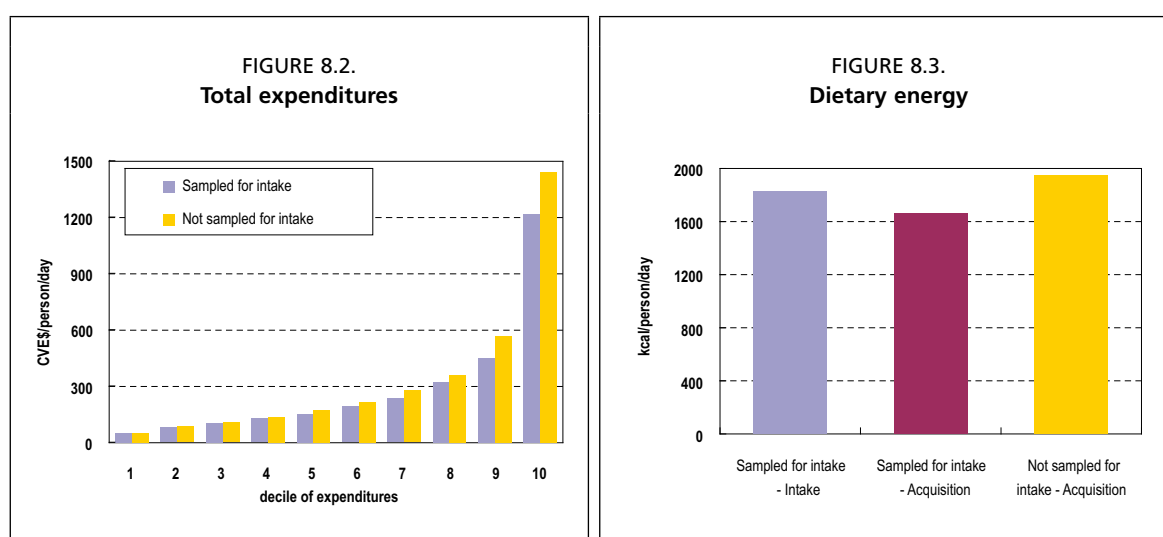
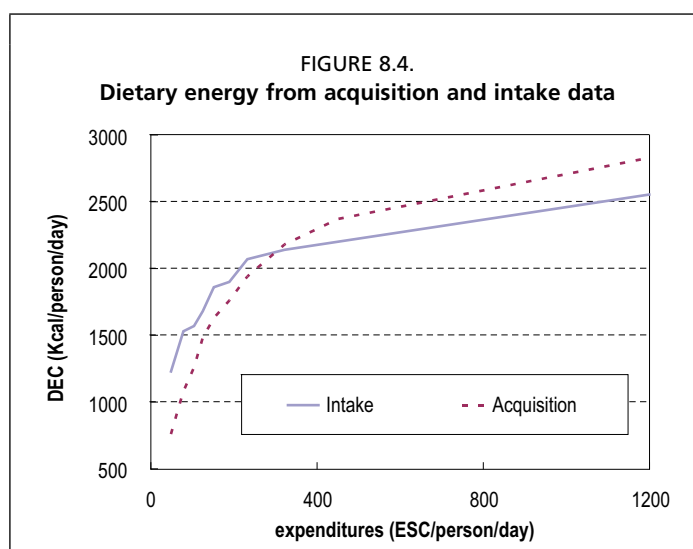


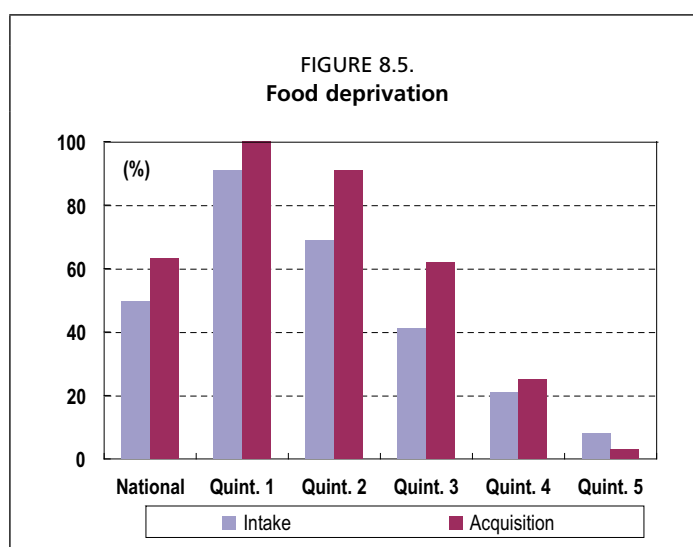
Figure 8.4 shows estimates of dietary energy using food data based on acquisition and intake by level of total expenditure in sub-sampled households. The acquired dietary energy per person per day was lower than the intake in low-income households and higher in high-income households. As income increased, the gap between acquisition and intake widened, reflecting households' growing ability to acquire more food and store it. Food acquisition recorded in household surveys may

be consumed (intake) during or after the household reference period, while food recorded as intake may be acquired during or before the reference period.



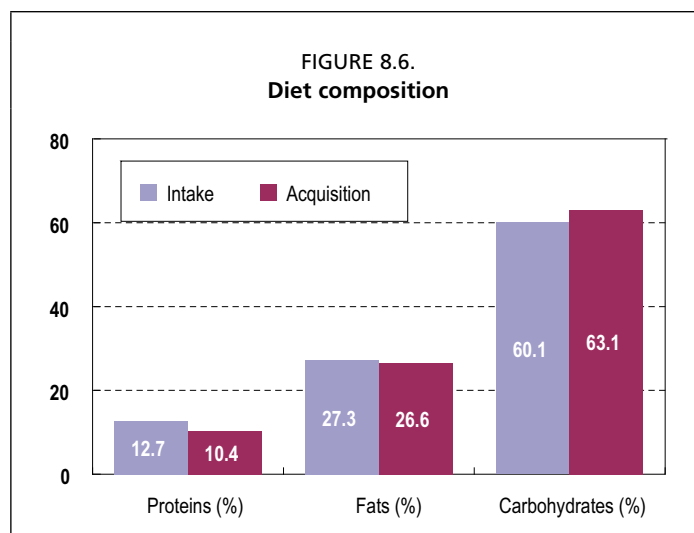
For middle-income households, acquired food may be consumed (intake) after the acquisition period, and food intake may be acquired before the intake reference period, and recorded data on acquisition and intake may balance at national level. For the lowest-income households, the two may not balance, owing to lower economic capacity to acquire food in quantities to allow consumption beyond the household reference period or to a lack of facilities for preserving perishable fresh food such as meat, fish and dairy products acquired and consumed on a daily basis; hence, acquisition data underestimate intake.

On the other hand, households at the highest income level do not consume all the food acquired during the household reference period. They also acquire food for consumption by non-members, such as workers, visitors and neighbours, which is recorded as consumed by household members, resulting in overestimates of food intake. As shown in Figures 8.4 and 8.5, the implication of acquisition's underestimation of dietary energy in low-income groups is an overestimation of food deprivation for sub-sampled households.



In terms of diet composition, as shown in Figure 8.6, dietary energy intake also showed a different pattern from that of acquired dietary energy.

Dietary energy intake was higher than acquired dietary energy for proteins and fats. The share of proteins from perishable food (fish, meat, dairy products and eggs) was higher for intake than for acquisition (33 versus 27 percent), the food consumed by lower-income households being more likely to be for immediate consumption owing to fewer facilities for buying and storing non-perishable food. It is also quite likely that these food products were acquired from higher-income households as payments in-kind.



The acquired food cost expressed in terms of energy was higher in the sub-sample of households than in the non-sampled households, as illustrated in Figure 8.7.

This difference in cost of energy may be linked to the quality of food consumed and the acquisition strategy for coping with everyday food security in the sub-sampled households. Selected low-income households consumed fewer cereals and cereal products than non-sampled households (46 versus 49 percent) and acquired smaller quantities of more perishable food at higher energy unit cost. The quantity unit cost of food intake was higher than that for acquiring food in larger quantities that may have been consumed for longer periods, as may occur in high-income level households. The dietary energy unit value has an effect on critical poverty lines, which are used for estimating critical food poverty (Figure 8.7).

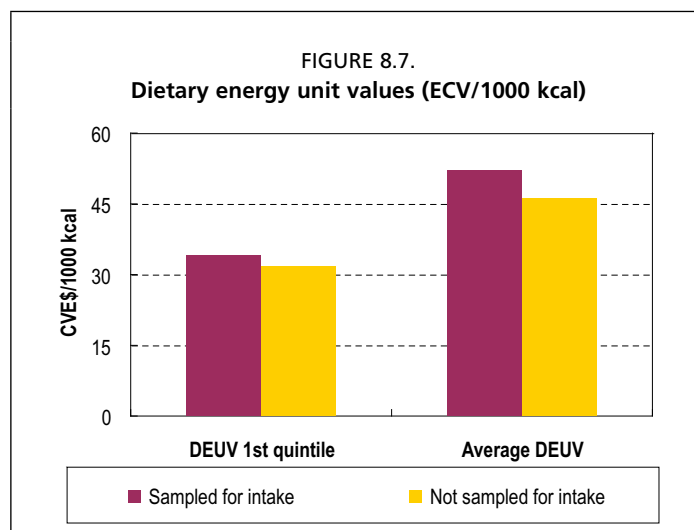
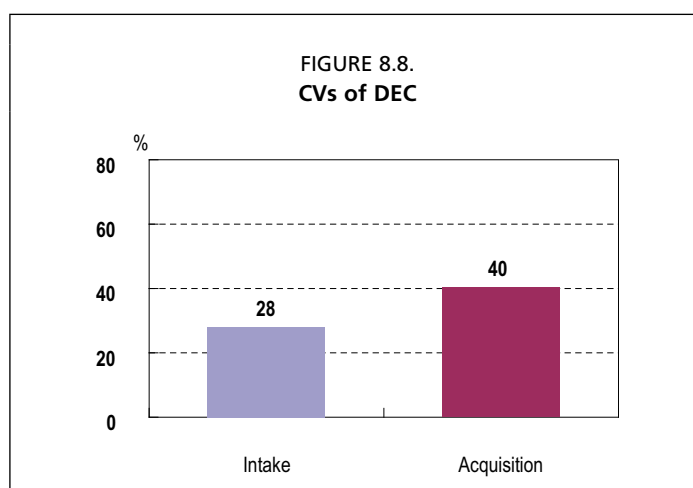


Figure 8.8 depicts the coefficients of variation (CVs) of dietary energy consumption (DEC), showing that dietary energy intake was more equally distributed among households than acquired dietary energy. A more equal distribution of dietary energy intake and a higher level of dietary energy imply a lower level of food deprivation (Figure 8.5).

The energy intake refers to a one-week period, which may pose a comparability problem with the two-week period for acquisition.

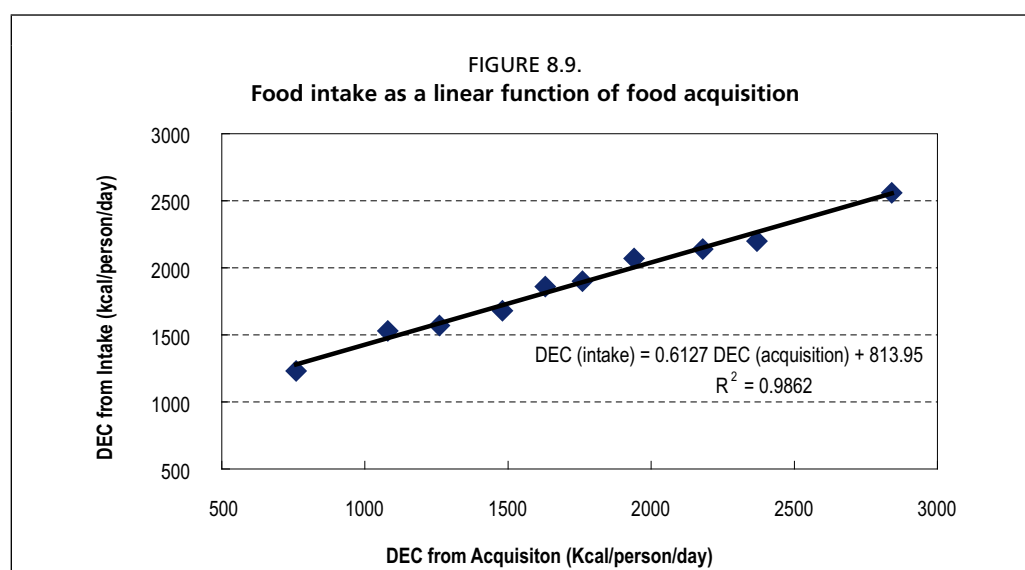


Other studies have reported similar findings on under and overestimation from acquisition compared with intake or consumption data at low and high income levels (Martirosova, 2007; Kvinikadze, Pantsulaia and Sibrian, 2007).

FOOD SECURITY STATISTICS FROM IDRF 2001/2002

As discussed, dietary energy from acquisition tends to be underestimated for low-income groups and overestimated for high-income groups. If sampling selection had not been biased (see Figure 8.7), then food intake data combined with information on household income could have had been used to assess food security in Cape Verde.

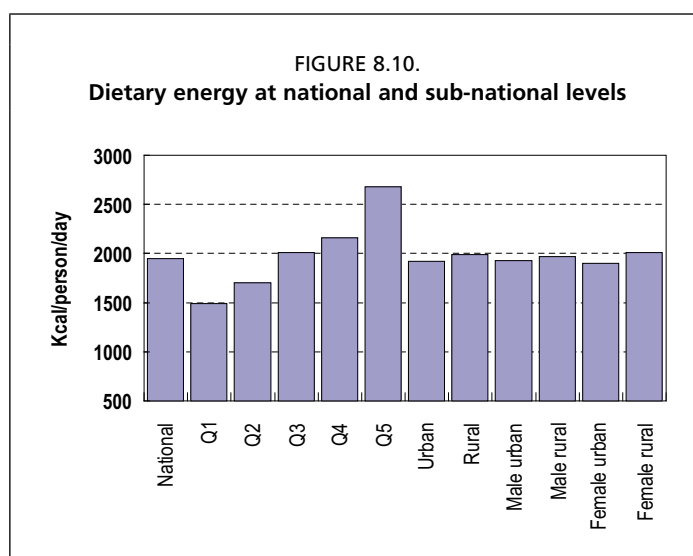
The analysis of food security at national and sub-national levels using food data from IDRF 2001/2002 was based on data on food intake, using data on food acquisition from the full sample. Figure 8.9 shows the relationship between dietary energy intake and acquisition at national level.



The results described in the following section are on food security statistics based on food intake, estimated from acquisition in all households using equations developed in the acquisition and intake study in sub-sampled households for urban and rural areas.

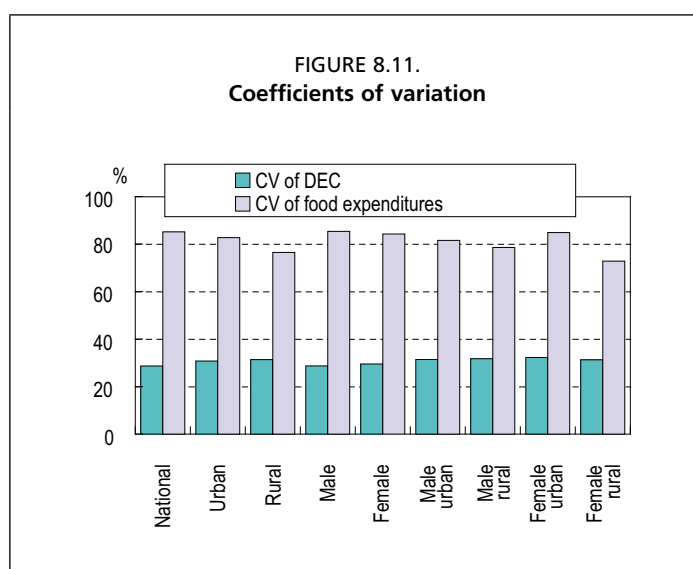
DIETARY ENERGY CONSUMPTION

According to IDRF 2001/2002, a person from Cape Verde consumed about 1950 kcal per day. Dietary energy intake differed by income level (Figure 8.10). Smaller differences were observed in favour of rural compared with urban households. Female-headed households in urban areas showed a lower level of dietary energy intake than those in rural areas.



Inequality in access to food due to income

Figure 8.11 illustrates access to food based on the CVs of DEC and food expenditures. Inequalities in access to food due to income as measured by the CV of DEC were quite high at national level (29 percent), but access to food was almost the same in all population groups at sub-national levels. Conversely, food expenditures were not equally distributed among sub-national groups.



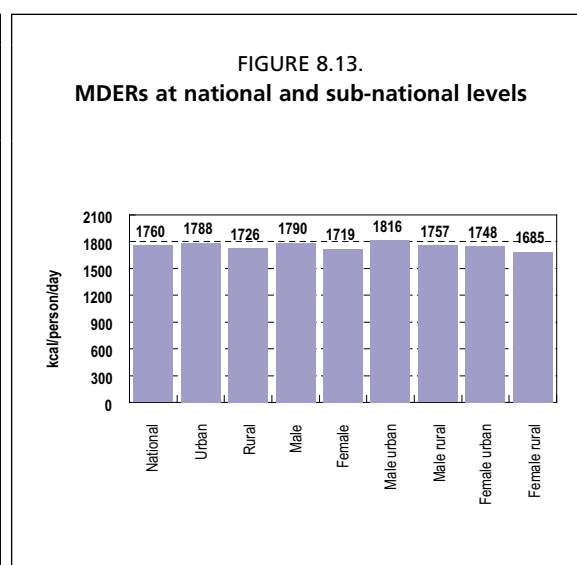
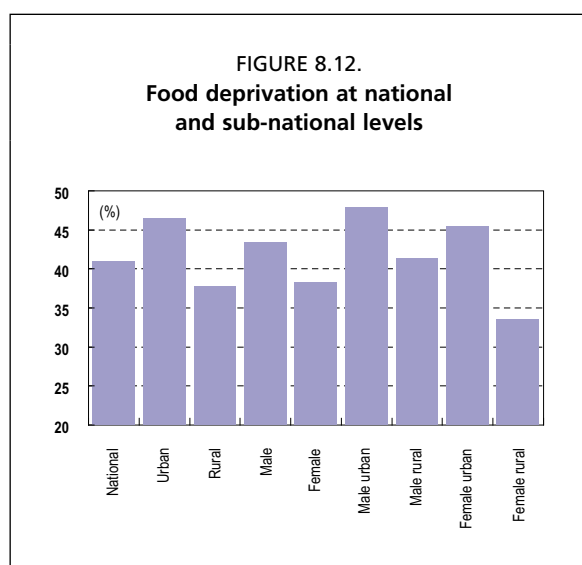
In general, inequalities in food expenditure were lower among rural than urban households, and at their lowest among rural female-headed households. Dietary energy was more equally distributed in urban than rural areas, in male than in female-headed households and between male and female-headed households in urban and rural areas.

Food deprivation

Figure 8.12 shows levels of food deprivation at national and sub-national levels. Food deprivation was quite high at national level (41 percent). At sub-national levels, a higher level of food deprivation was observed in urban than rural areas (46 versus 38 percent).

Food deprivation differed at sub-national levels even when dietary energy intake and access to food inequalities were similar, owing to higher minimum dietary energy requirement (MDER) in urban than rural areas and in male than female-headed households in urban areas (Figure 8.13).

The different MDER levels result from the different age and sex structures of population groups. Female-headed households yielded lower MDERs in rural and urban areas, probably linked to the absence of adult males.



CONCLUSION AND REMARKS

For food insecurity assessment purposes it is important to consider the collection of food data using both, the consumption or intake approach. In household surveys of large sample size it would be useful to measure intake in a sub-sample of households, in order to measure the relationships between intake and acquisition in urban and rural populations owing to the different dynamics of stocking food for human consumption.

It is important to consider the acquisition approach for the purposes of national accounts.

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