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FOOD SECURITY AND FOOD CONSUMPTION IN SAMOA

BASED ON THE ANALYSIS OF THE 2018
HOUSEHOLD INCOME AND
EXPENDITURE SURVEY

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Abbreviations and acronyms

AME	adult male equivalent
AUA	Apia Urban Area
DEC	dietary energy consumption
FAO	Food and Agriculture Organization of the United Nations
FIES	Food Insecurity Experience Scale
HCES	Household Consumption and Expenditure Survey
HDDS	Household Dietary Diversity Score
HDI	Human Development Index
HIES	Household Income and Expenditure Survey
kcal	kilocalorie (1 kcal is 1 000 calories)
MDER	minimum dietary energy requirement
NCD	non-communicable disease
NWU	North-West Upolu
PoU	prevalence of undernourishment
ROU	Rest of Upolu
SBS	Samoa Bureau of Statistics
SDG	Sustainable Development Goal
SPC	The Pacific Community
WHO	World Health Organization
WST	Samoa Tala (currency)



EXECUTIVE SUMMARY

The high rate of adult obesity observed in Samoa (almost 46 percent in 2016) points to access to an amount of dietary energy that is well above the minimum amount of dietary energy needed by the population to be in good health and to be socially active.

The analysis of the food data collected in 2018 in the Samoa Household Income and Expenditure Survey (2018 HIES) shows that less than 1 person out of 20 is undernourished. However, the analysis of the information collected in the same survey also finds that about one person in four does not have access to safe and nutritious food. This puts a one quarter of the population at greater risk of various forms of malnutrition and poor health than a food secure population, which has better access to safe and nutritious food.

The survey results are confirmed by the high number of deaths caused by non-communicable diseases (NCDs) in Samoa. Access to enough dietary energy is not an issue in Samoa, as health problems are mainly the consequence of the quality of the dietary energy that is being consumed, rather than the quantity.

Further analysis of the 2018 HIES shows that only 13 food products contribute to 80 percent of the total dietary energy consumed. Four of the products: coconut brown (18 percent), rice (11 percent), taro (9 percent) and chicken quarters (8 percent) contribute 46 percent of the total energy consumed.

On average, a Samoan spends 5.4 Samoan Tala (WST) a day to purchase food, which corresponds to 45 percent of their total expenditure. Purchases account for 62 percent of the dietary energy

consumed, and 30 percent comes from own production. More than 90 percent of the caloric intake comes from sweets, sugar, cereals, meat and fish that are purchased, while from own production, three quarters of the calories are from tubers, plantains, nuts and fruits.

Cereals such as rice or flour, or foods such as oils and sugar are very cheap sources of dietary energy, as it costs less than WST 1 to get 1 000 kcal from these products. To get the same amount of dietary energy from fish, milk or other dairy products would cost more than WST 5.

The variety of foods which households can have access to is uneven throughout Samoa. In Apia, 20 food products contribute to 80 percent of the dietary energy consumed. This number falls to 10 products in Savai'i. Coconut, taro, pastry of all kinds and rice represent half of the calories consumed in Savai'i, while rice, chicken, coconut, pastry, sugar and bread represent 50 percent in Apia. Savai'i is the region with the highest prevalence of food insecurity in Samoa, with more than one in three households being food insecure in comparison to less than one in five households in Apia.

In terms of essential nutrients, the Samoan diet is rich in fats that, on average, contribute 34 percent of the total amount of energy consumed, which is very close to the upper limit of the World Health Organization (WHO) recommended norms for a balanced diet. Proteins, on average, contribute 11 percent and carbohydrates to 55 percent, both of which are close to the lower limit of the WHO recommended norms.

Note from the authors: Even if all the survey results are consistent with the overall food security status of the country, they need to be treated and interpreted with caution. The survey was not designed to be conducted as an in-depth analysis on food consumption and nutrition. The food data presented some imperfections, such that levels or indicators need to be interpreted as reflecting survey trends rather than recorded facts. However, it is only through anthropometric and food consumption surveys that the nutritional status of individuals can be properly informed.



INTRODUCTION

Samoa is one of the Polynesian island countries of the Pacific. It consists of two main islands, Upolu and Savai'i, and four smaller islands, Manono, Apolima, Fanuatapu and Namua. The capital city is Apia, located on the island of Upolu.

With a population of 195 979,¹ Samoa is the second most populous of the Polynesian island countries after French Polynesia. With an average of 70² people per km² for a total area of 2 830 km², it is also the country with the lowest population density after Niue. One third of the population lives on the island of Upolu. With a human development index of 0.707,³ Samoa ranks 111. It comes after Tonga, which is the Polynesian island country with the lowest HDI ranking at 105. Since 2014, Samoa has been classified as an economically developing country.

More than 27 000 households⁴ in Samoa depend on agriculture but the value added to the gross domestic product from agriculture, fishery and forestry in total does not exceed 10 percent.⁵ Most Samoans grow food crops for home consumption and cash crops, such as coconut oil, coconut cream, taro, cocoa and banana, for export. But these exports contribute marginally to total export of food, which is dominated by frozen fish (non-fillet). In 2018, frozen fish represented about 24 percent of the value of total exports. Most food products consumed are imported, and Samoa is a net importer with a negative trade balance that has increased from USD 30 million in 1995 to USD 355 million in 2019. Meat products (poultry, sheep and goat meat, and dairy products), cereal products (rice and wheat flour), baked goods, frozen and processed fish, and raw sugar represent almost 16 percent of the total value of imports.⁶

FIGURE 1
Map of Samoa



SOURCE: Ezilon.com

¹ Based on 2016 population census.

² From Worldometers info website: <https://www.worldometers.info/world-population/samoa-population/>

³ Human Development Index 2019: <http://hdr.undp.org/en/content/2019-human-development-index-ranking>

⁴ Based on 2015 agriculture survey

⁵ World development indicators

⁶ Observatory of economic complexity: https://oec.world/en/visualize/tree_map/hs92/import/wsm/all/show/2017 and COMTRADE

The gradual tariff liberalization drastically reduced the cost of imported foods compared to locally produced substitutes. This access to more affordable fatty and sweet foods, such as off-cuts of meat, carbohydrate drinks and baked goods, has led to a deterioration of the traditional diet of the Samoan population that further translates into drastic increases in obesity rates. Out of every 18 children less than age 5 years at least one is overweight, and over the course of 16 years, the prevalence of obesity in the adult population increased from 34 percent to 45.5 percent, which is far above the 13.2 percent average observed in the world. In addition, the adult diabetes rate in Samoa rose from 22.3 percent in 2002 to 45.8 percent in 2013. There were also increases in cardiovascular diseases, cancer and chronic respiratory diseases. NCDs are the leading causes of death and disability in Samoa and are responsible for more than 70 percent of deaths.⁷

The high rates of overweight and obesity observed in Samoa point towards access to an amount of energy that is well above the average dietary energy requirements of the population. Indeed, the analysis of the food data collected in the Household Income and Expenditure Survey (HIES) conducted in Samoa in 2018 shows that less than 1 person in 20 is undernourished. But the analysis of the information collected in the same survey also finds that more than 24 percent of the population does not have access to safe and nutritious food, which is far from reaching Target 2.1 of the Sustainable Development Goals (SDGs) that aims at ensuring, by 2030, access by all people, in particular the poor and people in vulnerable situations including infants, to safe, nutritious and sufficient food all year round. It is only through better knowledge of food consumption and nutrient patterns that it will be possible to develop adequate nutrition policies that will monitor progress towards reaching food security for all.

In 2018, as part of its regular programme to monitor socio-economic indicators, the Samoa Bureau of Statistics (SBS) conducted the HIES, which is a large-scale national survey conducted over the year.

The survey is aimed at gathering data on the incidence of hardship and poverty, and to update the consumer price index, among other indicators. It contains a comprehensive module on food consumption that was collected through a two-week diary administered to more than 3 000 households. In addition to the food consumption module, the 2018 HIES includes the Food Insecurity Experience Scale (FIES) developed by FAO to inform the SDG indicator 2.1.2 (prevalence of moderate or severe food insecurity based on FIES).

This report, which is derived from the analysis of the food data and FIES data collected in the 2018 HIES, presents the findings on current patterns on food security and consumption in Samoa. Whenever possible indicators are given at the national level and for sub-groups of population. The analysis was performed using ADePT-Food Security Module (ADePT-FSM),⁸ free software developed jointly by World Bank and FAO, to analyse the food data collected in Household Consumption and Expenditure Surveys.

The first section of the report provides a description of the survey and food consumption module, and outlines the limitations to the analysis. The second section discusses the two SDG target 2.1 indicators: the prevalence of undernourishment (SDG indicator 2.1.1) and the prevalence of moderate or severe food insecurity based on the FIES (SDG indicator 2.1.2). These two indicators have been adopted by Samoa as core indicators to report in their 2020 Voluntary National Review, and this is the first time Samoa has gathered data for these indicators in a national survey. The third section of the report presents the main patterns in food consumption for the country as a whole and for targeted population groups. This section is followed by an in-depth discussion on the nutritional status in terms of composition of the diet and apparent consumption of essential nutrients. The last section of the report looks at regional disparities and provides a profile of food insecure people in terms of who they are and what they consume.

⁷ Source: http://www.commonwealthhealth.org/pacific/samoa/non_communicable_diseases_in_samoa/

⁸ For more information on ADePT-FSM refer to <http://www.fao.org/economic/ess/ess-fs/fs-methods/adept-fsm/en/>

CHAPTER 1

DESCRIPTION OF THE SURVEY AND DATA PROCESSING

The Samoa Household Income and Expenditure Survey (HIES) has been designed to assess the hardship and incidence of poverty throughout Samoa, obtain expenditure weights by tracking household patterns of consumption and expenditure to rebase Samoa's Consumer Price Index, and provide household data to assist in compiling official estimates of household accounts in the system of National Accounts. HIES is implemented by the Samoa Bureau of Statistics (SBS). The data are representative at the national level, in urban and rural locations, and in four geographic regions. The survey collects socio-demographic and food insecurity data from households with details on health-related information on individual family members. This survey covered about 20 750 individuals in 3 018 households who were able to complete the questionnaire.

1.1 Sample frame

The sample for HIES 2018 was drawn from the master sample frame of the household listing from the most recent population and housing census of 2016. The sample was designed to cover 10 percent of the households in both the urban and rural area. This allowed for detailed analysis for most indicators at the national level, for urban and rural areas, and for each of the four regions of Samoa: Apia Urban Area (AUA), North-West Upolu (NWU), Rest of Upolu (ROU), and Savai'i. The first region is located in the urban area, while all others are in the rural areas of Samoa.

For HIES 2018, a representative probability sample of households was selected in two stages. The first stage involved the selection of clusters or primary sampling units using probability proportional to size, resulting in a total of 188 clusters, of which 48 clusters were selected from AUA, 59 in NWU, 40 in ROU, and 41 in Savai'i. In the second stage of selection, a fixed number of 15 households were selected systematically from the AUA clusters and a fixed number of 20 households were selected from the three rural regions due to higher costs of transportation in those regions. The household response rate of 82 percent from the previous HIES was considered, hence the increase in the amount of households needed from each region. This resulted in a total of 696 selected households in AUA, 1 173 in NWU, 750 in ROU, and 811 in Savai'i. The total number of households selected was 3 430, however, due to the 82 percent response rate from the previous HIES, the final sample number of households expected to respond is estimated at 2 812.

The survey was conducted in four rounds throughout 2018. The first round was undertaken in March, the second in June, the third in September and the last round in November. The objective of carrying out the field work intermittently was to more accurately record the expenditure patterns of households throughout the year, taking into account changes in expenditure due to seasonality and holidays.

Each round lasted four weeks during which enumerators were required to live in the respective villages, allowing them to more easily visit selected households on a daily basis to check on daily recording of expenditure during the two-week diary period.

1.2 Survey instrument

The HIES survey instrument is composed of six modules.

Module 1: Demographic and activity information

This module collected data about each household member's demographic profile and activities during the past week. It included questions about previous household members who may have died or who have moved away with no intention of returning. For the first time in Samoa, eight questions associated with the Food Insecurity Experience Scale (FIES) were added and asked to each household member.

Module 2: Housing characteristics

This module included household expenditure for the house itself, and for utilities and communication; purchase and/or maintenance of the house and/or lot; durable household goods and services; provisions of local financial support; donations or contributions to ceremonies of other households; and major events hosted by the household.

Module 3: Household members' education and health status

This module was used to collect data on individual expenditure on education, health care, private travel, clothing and communication.

Module 4: Household receipts for wages, other income and loans

This questionnaire was used to collect data on household members' (age 15 years and older) receipts from:

- Wages and salaries from main activity
- Wages and salaries from secondary activity
- Money received from irregular activities
- Loans made in the past 12 months

Module 5: Household receipts from activities

This questionnaire was used to collect data on household members' (age 15 years and older) receipts from:

- Non-subsistence business activities
- Agricultural activities
- Horticulture/floriculture activities
- Handicraft and home processed food/non-food activities
- Livestock raising activities
- Fishing and gathering sea products activities
- Property, transfers, and other income activities
- Remittances from abroad

Module 6: Diary

The diary collected daily expenditure for two weeks of a sampled household. It was a self-administered questionnaire booklet in which respondents were to record the details on items purchased via cash or credit, payments for services, receipts of in-kind gifts from other households, food or items from their own production, cash given away, cash received, and gambling if any.

The first two weeks of enumeration were spent identifying selected households and administering the first five modules during the initial interview. Respondents were then informed about the diary that would be completed in the last two weeks of the enumeration period, and another visit was scheduled.

On the third week of enumerations, the diary was introduced to selected households. The diary was used to record all expenditure on food and non-food items purchased; payments for services performed; value of goods received as gifts from other households; home produced consumed and/or given away as gifts; cash given away and/or received; and gambling.

Enumerators instructed the selected households and showed them how to fill out each day of the diary for the first week. During the two weeks diary period, enumerators visited selected households every other day to check on diary entries from the previous day to ensure accurate completion of required fields. After the first week of the diary was completed, the interviewer collected the completed diary and provided the selected households with the diary for the second week for recording expenditures for week two. Enumerators also used the two-week diary period to complete any remaining individual modules that remained incomplete due to household members not being present during initial interviews.

The survey was conducted in four rounds, in which each round had its own set of sample households.

All households with completed household and individual modules, and diary forms were tagged as completed. For households with completed household and individual modules but only one week of completed diary, this was computed by copying the completed diary from the first week to impute for the second week. These cases were also tagged as completed. Only those cases or households with interview status = 1 (completed) have weights.

1.3 Food consumption module and food data processing

Food data was collected through the 14-day diaries in which households were asked to report on their daily purchases, on the food they consumed from their own stocks or they received for free. Quantities and expenditures were collected. Quantities were reported in local units of measurement that needed to be converted into grams for the food consumption analysis.



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The Food Composition Database,⁹ developed by the Pacific Community (SPC) in collaboration with FAO and Wollongong University, based on the Food Composition Table of the Pacific, was used to allocate nutrient values to the food products. In addition to the dietary energy obtained from the four macronutrients (proteins, fats, carbohydrates and fibre), Vitamins A, B1, B2, B12 and C were analysed together with the two essential minerals: calcium and iron.

1.4 Limits to the analysis

The 2018 HIES of Samoa was not designed to perform a food security analysis, and because of the limitations observed in the food data collected, some margin of error needs to be attached to the estimates.

Among the main limitations observed in the food data:

- It is believed that food consumed away from home in urban areas was not comprehensively captured in the survey, and therefore, data suffer from under reporting in urban areas. On the other hand, it is believed that consumption of staple foods in rural areas was slightly over reported, as some households might have reported the quantity harvested rather than the quantity consumed. These errors of under and over estimation could be considered to cancel each other out, such that, at the national level, the average is close to the habitual consumption of a representative Samoan. However, the average at the sub-regional level might suffer from over or under estimation. For this reason, data are not reported at sub-regional level whenever they refer to average or percentage of the population.
- Food quantities were collected in many different units of measurement (more than 4 000 different combinations of products and units of measurement). Some of the conversions were not available, and therefore, about 13 percent of the quantities were converted into grams or energy using the regional median cost of one gram of product or the cost of one kcal when available.
- About 0.45 percent of the quantities reported were identified as outliers. These were corrected using the value of the 25th or 75th percentile of the distribution of the quantity of the food product in urban or rural areas.
- Descriptions of some food products were not always well reported or coded.
- The effect of fatigue of enumerators could be noticed in the last two rounds with a drop of records reported in the diary. The number of records drops from an average of 69 records per household in first round to 58 in third and last rounds.
- Nineteen households reporting too few items or too high dietary energy over the 14 days of the diary were dropped from the analysis.

⁹ Forthcoming "Pacific Nutrient database Version 2 – A tool to facilitate poverty, nutrition and food security analysis in the Pacific region", SPC/FAO/UoW 2020.



CHAPTER 2

SAMOA AND SDG TARGET 2.1

In the 2020 Voluntary National Review, Samoa will report for the first time on the two SDG indicators adopted to monitor Target 2.1¹⁰ on ending hunger. Data for both indicators are obtained from data collected in the 2018 HIES.

2.1 Prevalence of undernourishment

The prevalence of undernourishment, which is the percentage of the population whose dietary energy intake is lower than the amount of energy it needs to be in good health and have an active life, has been regularly monitored by FAO and reported yearly in the State of Food Security and Nutrition in the World reports.¹¹ The prevalence of undernourishment has been used to monitor and report on global hunger since 2000 to report on progress toward the Millennium Development Goals (MDGs), and has been endorsed in September 2015 as Sustainable Development Goal 2.1.1. In order to provide a comparable estimate over time and across countries for global monitoring, the prevalence of undernourishment is based on the Dietary Energy Supply compiled by FAO in the Food Balance Sheets.

However, whenever food data are collected in large-scale representative national surveys, it is possible to derive the average amount of energy consumed in the country together with the indicator of dispersion of the dietary energy consumption within the population (see Annex 1 Methodology).

Based on the food consumption data collected in the 2018 Household Income and Expenditure Survey (HIES) conducted in Samoa, it was found that less than 1 person in 20 is undernourished in Samoa (SDG 2.1.1 ranges between 2.5 percent and 5 percent). Which means that more than 5 000 people but a number fewer than 10 000 people in Samoa are experiencing hunger.

Because of data limitations, SDG 2.1.1 could not be disaggregated by regions for Samoa.

2.2 The prevalence of food insecurity based on FIES

The Food Insecurity Experience Scale (FIES) was tested for the first time in Samoa through the inclusion of the FIES module in the 2018 HIES. The scale is composed of eight dichotomous questions asking respondents to report on their experiences in accessing enough and/or nutritious food with respect to their resources. The scale has been adopted to monitor progress towards SDG 2.1 through the SDG 2.1.2 indicator of the prevalence of moderate or severe food insecurity based on the FIES.

Food insecurity as measured by this indicator refers to limited *access to food*, at the level of individuals or households, due to lack of money or other resources.

Preliminary estimates find that about 1 person in 40 (or about 5 090 people) in Samoa was exposed to severe levels of food insecurity in 2018, implying reductions in the quantity of food consumed to the extent that they have possibly experienced hunger.¹²

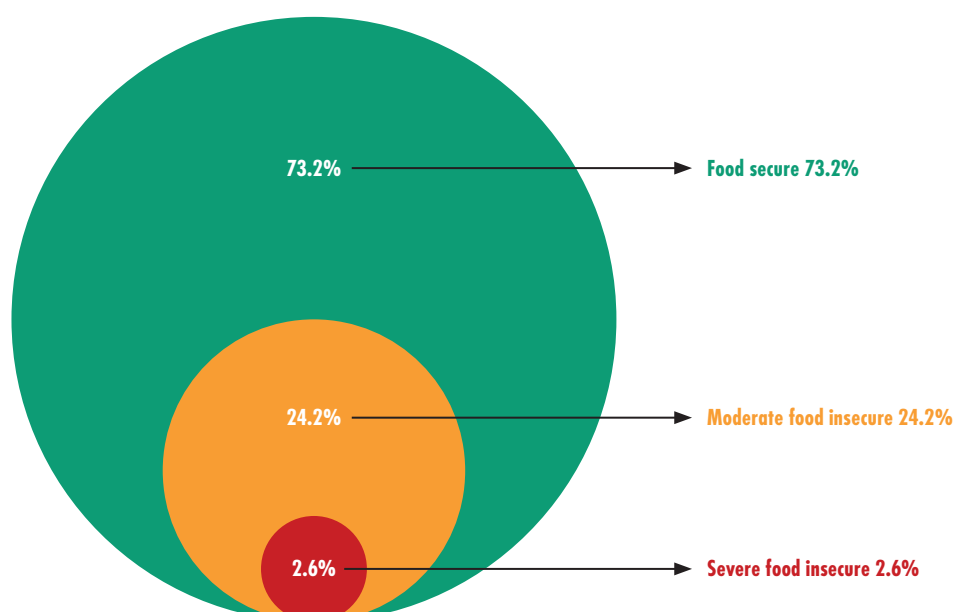
A broader look at the extent of food insecurity, beyond severe levels and hunger, reveals that an additional 48 000 people have experienced food insecurity at moderate levels (about 24 percent of the population) (Figure 2). This implies that these additional people did not have regular access to safe and nutritious foods, even if they were not necessarily suffering from hunger, thus putting them at greater risk of various forms of malnutrition and poor health than the food secure population.

¹⁰ This assessment does not include potential impact of the COVID19 pandemic on SDG 2.1 estimates.

¹¹ The FAO State of Food Security and Nutrition in the World: <http://www.fao.org/state-of-food-security-nutrition/en/>

¹² This estimate is on line with the SDG 2.1.1 estimate for Samoa discussed earlier.

FIGURE 2
Prevalence of food insecurity (Percentage of individuals)



SOURCE: Food Insecurity Experience Scale data collected in 2018 HIES of Samoa

But some disparities in prevalence and levels of food insecurity can be observed at the sub-national level. Savai'i is the region where food insecurity is the highest with more than one household in three not having access to safe and nutritious food. And almost 4 percent of households do not have access to enough food. The rest of Upolu, however, presents

the lowest rate of severe food insecurity but moderate food insecurity remains the highest in Samoa after Savai'i. Apia exhibits the lowest prevalence rates but still 15 percent of the households living in Apia are struggling to access safe and nutritious food, and 2 percent does not have access to enough food.

TABLE 1
Prevalence of food insecurity based on the FIES at regional level (Percentage of households)

	Samoa	Urban (Apia)	Rural	North west Upolu	Rest of Upolu	Savai'i
Moderate food insecurity	22.4%	15.2%	24.4%	19.7%	25.6%	30.5%
Severe food insecurity	2.4%	1.9%	2.5%	2.6%	1.1%	3.6%
Moderate or severe food insecurity	24.8%	17.1%	26.8%	22.3%	26.7%	34.1%

SOURCE: Food Insecurity Experience Scale data collected in 2018 HIES of Samoa



CHAPTER 3

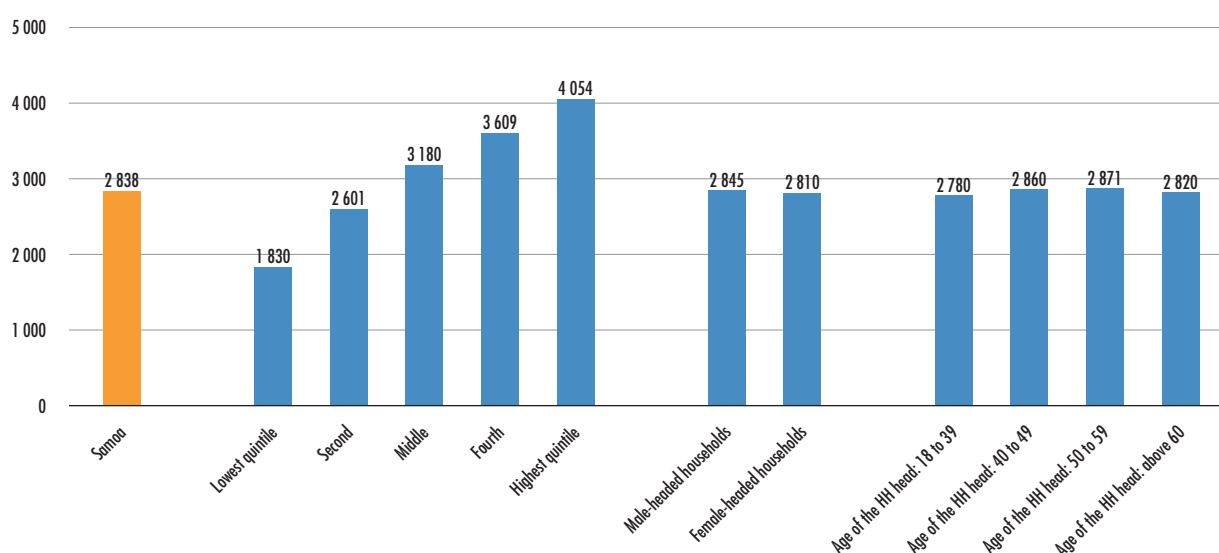
BASIC FEATURES ON FOOD CONSUMPTION IN SAMOA

In Samoa¹³ people consume on average 2 840 kcal per capita per day.¹⁴ However, this average amount of dietary energy (DEC) is not equally distributed throughout the population, and some disparities can be observed within the population with richer households (i.e. 20 percent of the households at the top of the total expenditure distribution) accessing twice as much dietary energy than poorer households (i.e. 20 percent of the households at the bottom of the total expenditure distribution).¹⁵ There is a marginal difference of 35 kcal/capita/day between the average dietary energy consumed within male-headed households in comparison with female headed households (Figure 3).

The size of households in Samoa is quite large, with an average of 7 people and a maximum of 27 people per household. The larger the size of the household, the lower the amount of dietary energy consumed on average. Households composed of more than 12 people, on average, consume 1 600 kcal per capita per day less than households of a smaller size composed of about 3 people, on average. The dietary energy gap is 200 kcal higher when the total amount of dietary energy in the household is converted in the adult male equivalent, as large households usually contain many children, who consume fewer calories (Figure 4).¹⁶

FIGURE 3
Distribution of average dietary energy consumption

Average dietary energy consumption (kcal/capita/day)



SOURCE: Food data collected in 2018 HIES of Samoa

¹³ All statistics are expressed on a per capita basis and do not consider the sex and age of the individuals.

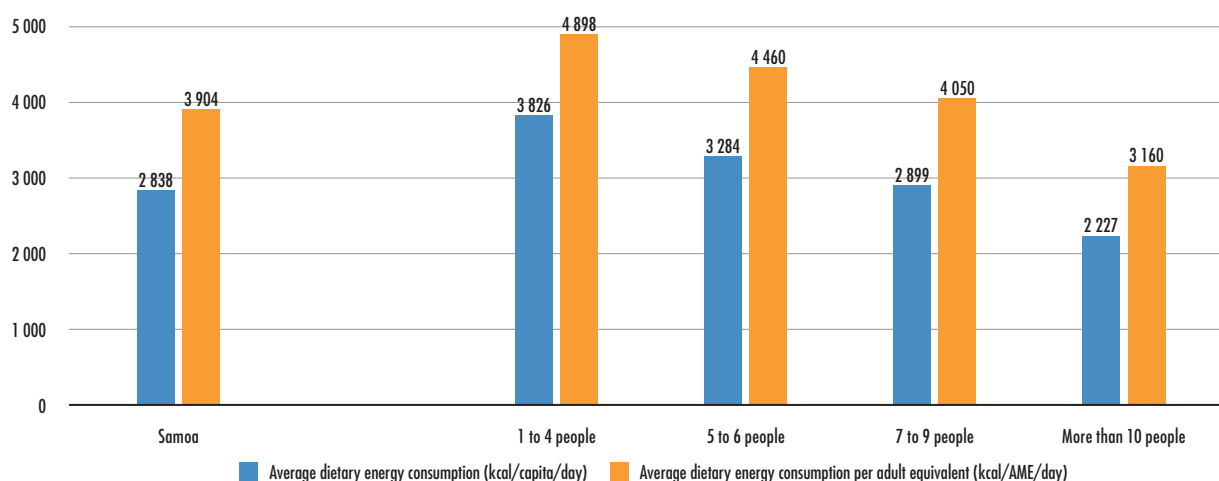
¹⁴ Food consumption indicators computed from household level and expressed in terms of dietary energy, and macronutrient and micronutrient data are usually labelled “apparent consumption” (Fiedler, 2013). These indicators are usually based on food quantities (edible amounts) available for consumption, not on *actual intake*, and in most cases, they refer to the raw form before preparation. An analysis using Household Consumption and Expenditure Surveys could under or over estimate actual food intake as compared with an individual-level survey.

¹⁵ The household per capita total expenditure is being used as proxy of the household income.

¹⁶ On a per capita basis, the total amount of energy consumed in the household is divided by the number of people present in the household, while in a adult equivalent basis, it is assumed that dietary energy is distributed within the household based on the dietary energy requirements of the household member. A household composed of two adults and two children will have a lower dietary energy consumption when expressed on a per capita basis rather than on per adult equivalent basis (as children will require less dietary energy than a male adult).

FIGURE 4
Distribution of dietary energy consumption by size of the household

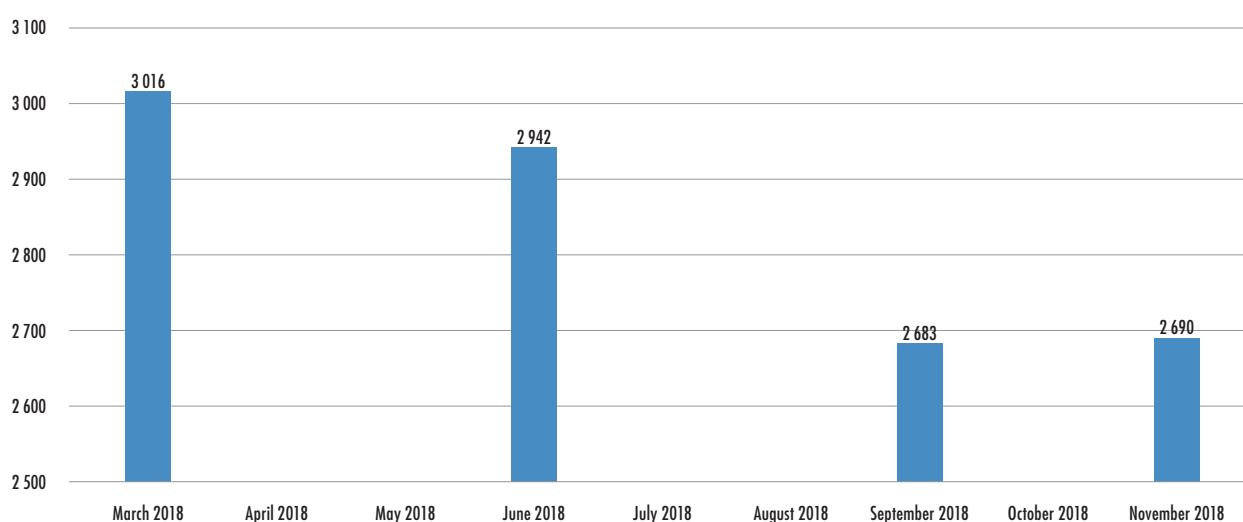
Average dietary energy consumption (kcal/day) in per capita and adult male equivalent



SOURCE: Food data collected in 2018 HIES of Samoa

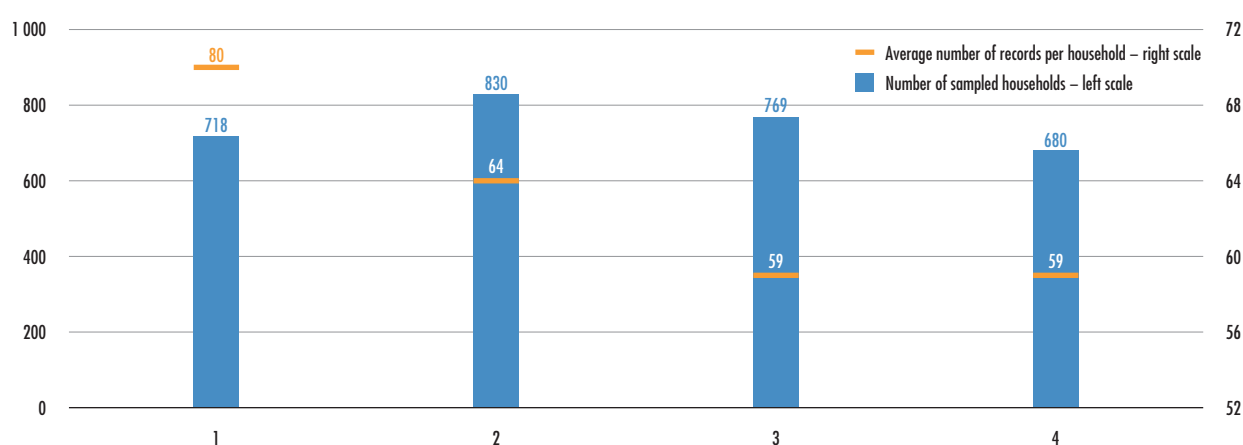
FIGURE 5
Seasonal variation of the food consumption

Average dietary energy consumption (kcal/capita/day)



SOURCE: Food data collected in 2018 HIES of Samoa

Average dietary energy consumption (kcal/capita/day)



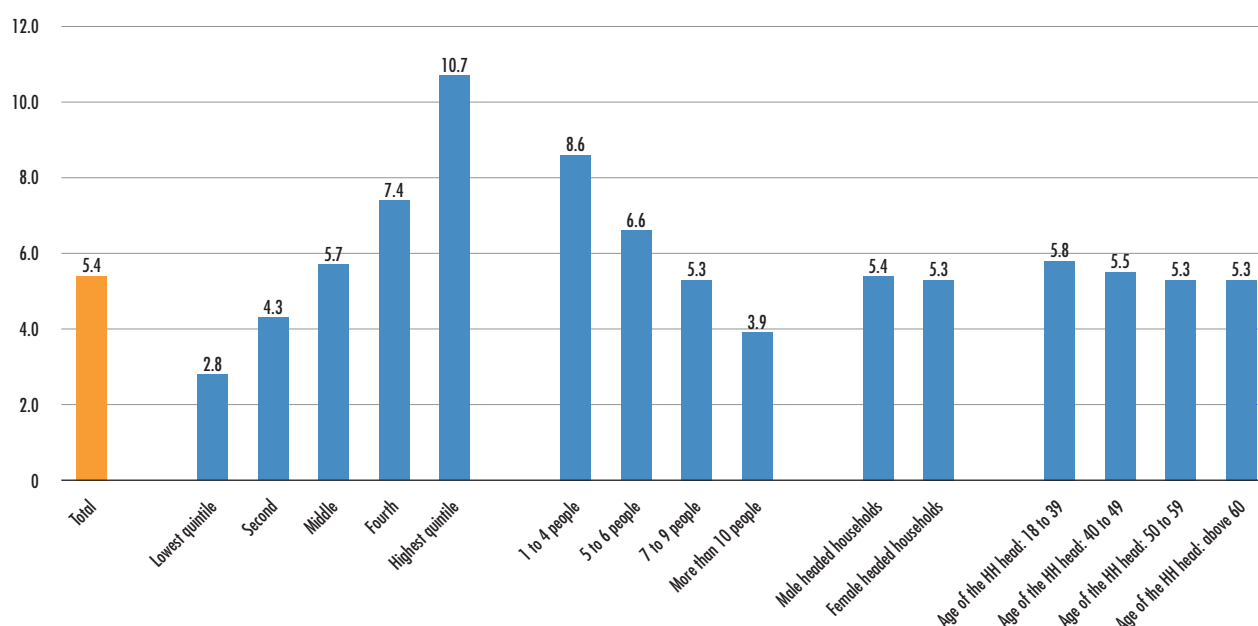
SOURCE: Food data collected in 2018 HIES of Samoa

Some variability over the course of the year can be observed in the DEC, with average DEC higher by more than 300 kcal/capita per day in March 2018 compared to September 2018. This decrease in consumption may reflect a seasonal effect in consumption or an effect of fatigue of enumerators,¹⁷ as can be seen from the distribution of the sample over time and average number of records reported by households, which drops from 70 in first round to 59 in last round (Figure 5).

On average, households spend WST 5.4 to acquire foods, with richer households and small-size households spending at least twice as much to acquire food compared to poorer households or households of a larger size. Households that have a head of household younger than age 40 years old consume less dietary energy than households with a head that is older. However, the younger-headed households spend 50 cents more to acquire the food than the older-headed households (Figure 6).

FIGURE 6
Distribution of the average food consumption expenditures

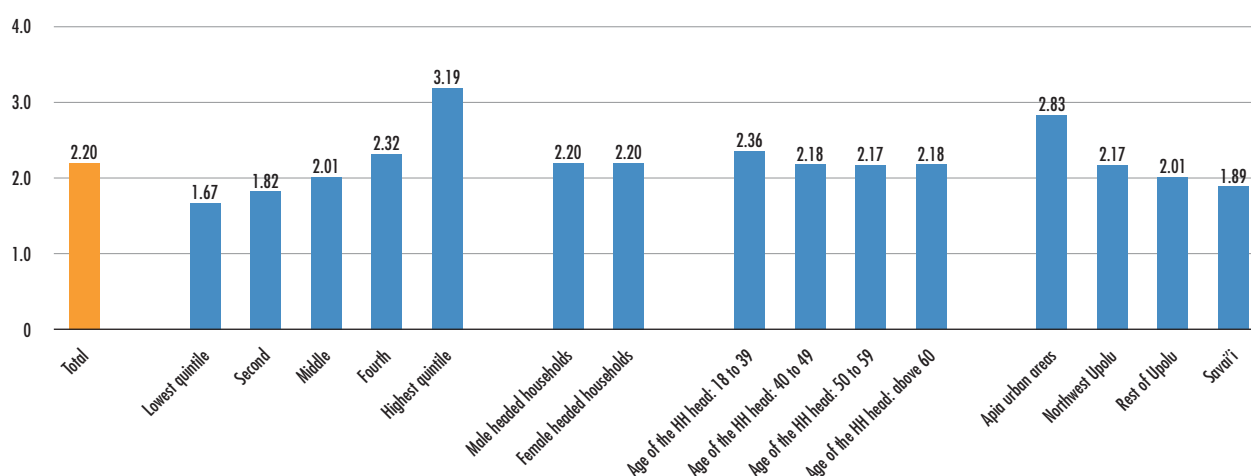
Average food consumption in monetary value (WST/capita/day)



SOURCE: Food data collected in 2018 HIES of Samoa

FIGURE 7
Distribution of the average cost of 1 000 kcal

Average dietary energy unit value (WST/1 000kcal)



SOURCE: Food data collected in 2018 HIES of Samoa

¹⁷ Except for roots and tubers, fruits, vegetables and oil crops the quantities consumed are overall higher in March than in the other months. The peak of consumption of vegetables and fruits is observed in November while more quantities of roots and tuber are consumed in June compared to other months.

It costs, on average, WST 2.2 to purchase 1 000 kcal. Poorer households access food of lower quality than richer households, as they spend only WST 1.7 to acquire 1 000 kcal, compared to the WST 3.2 spent by richer households to access the same amount of dietary energy. Again, the larger the size of the household, the lower the quality of the food, as cost spent for 1 000 kcal for large households is WST 1.9 compared to WST 2.7 spent by smaller households. To get 1 000 kcal for households living in Apia and other urban areas, the cost will be 50 percent more than for households living in Savai'i. Households with a head who is younger than 40 years old will spend more to acquire 1 000 kcal compared to households with a head who is age 60 years and older (Figure 7).

On average, food expenditures represent 45 percent of the total household expenditure. The poorer the household is, the higher the share of food expenditure to the total budget. More than one half of the overall budget of poor households is allocated to food, therefore, leaving less available for the acquisition of other essential goods. Food expenditures represent only one fourth of the total budget of rich households. Some discrepancies can be observed between regions. Savai'i, people allocate more than 50 percent of their budget to acquire food while this share is lower in Apia and other urban areas. For large size households, the share of food in their total budget expenditure is

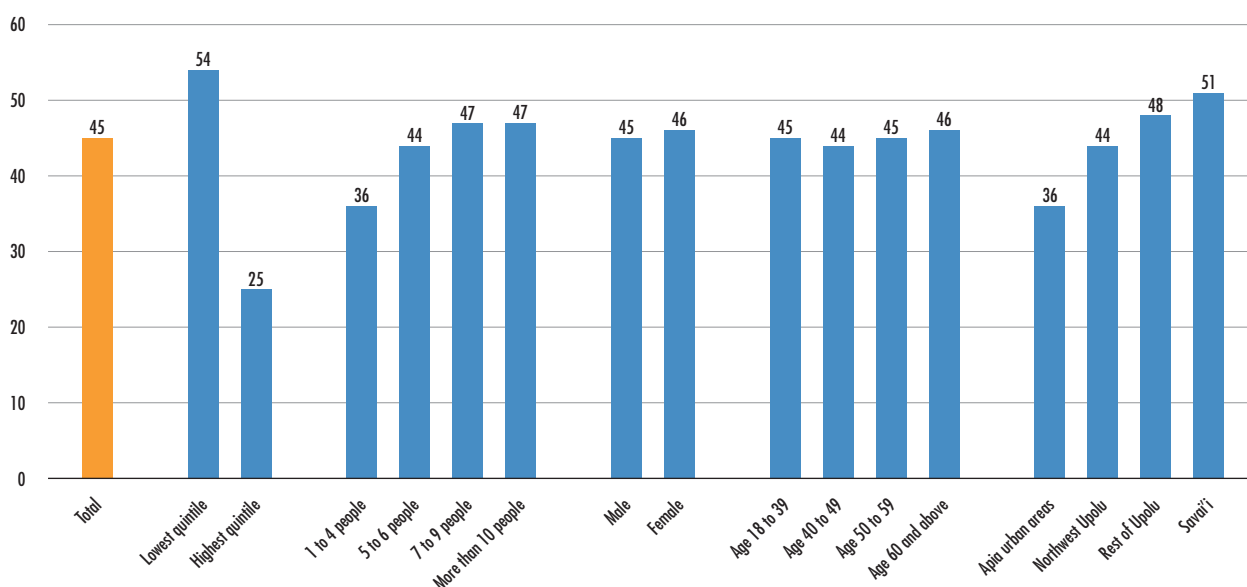
47 percent compared to 36 percent for smaller size households (Figure 8).

More than 60 percent of the 2 800 kcal/capita/day consumed by a Samoan comes from purchases, with own production contributing 31 percent, on average. Poorer households consumed 37 percent of own production, while richer households purchased more than 75 percent of their dietary energy consumed (Figure 8). Richer households received more food for free than poorer households, which can be explained by the larger social networks and higher involvement in church activities of rich households than poor households.

Looking at the same sources of acquisition in terms of their contribution to the total amount spent to acquire food, the same pattern can be found. This means that of the WST 5.4 spent to acquire food, less than 30 percent is coming from own production compared to more than 60 percent coming from purchases. The strong reliance to purchases presents a higher risk for households to access markets in periods when food becomes scarce and prices are increasing. In turn, poor households will be more vulnerable to natural disasters, as the food they consume from their own production contributes to more than one third to their total amount spent to acquire food.

FIGURE 8
Share of food expenditures in total expenditures

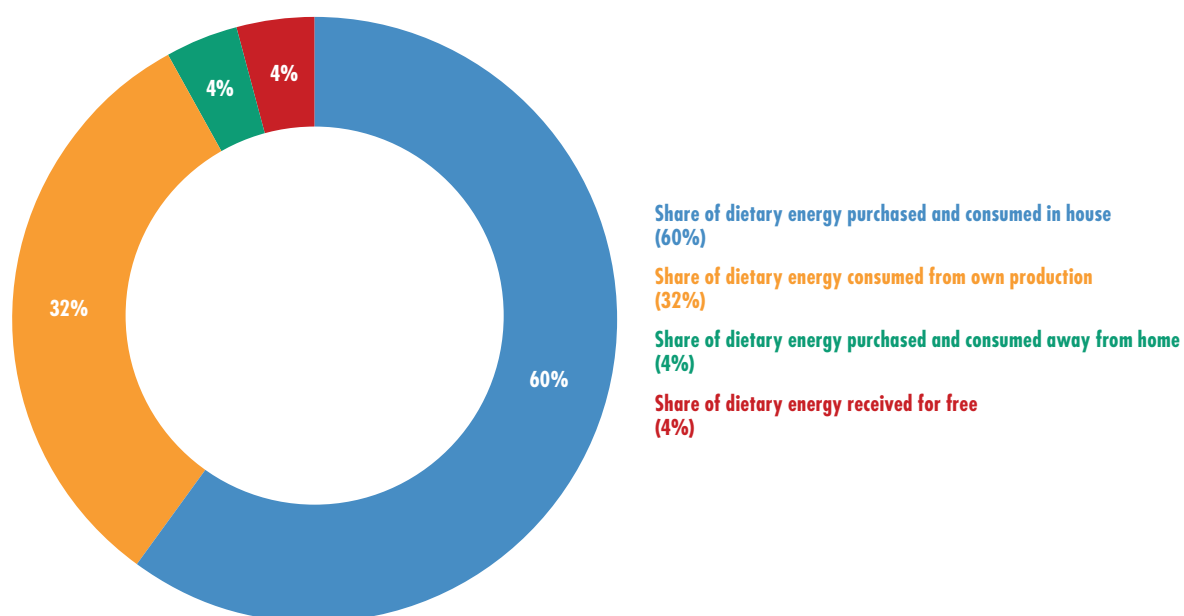
Proportion of food consumption expenditures in total expenditure (%) (Engel ratio)



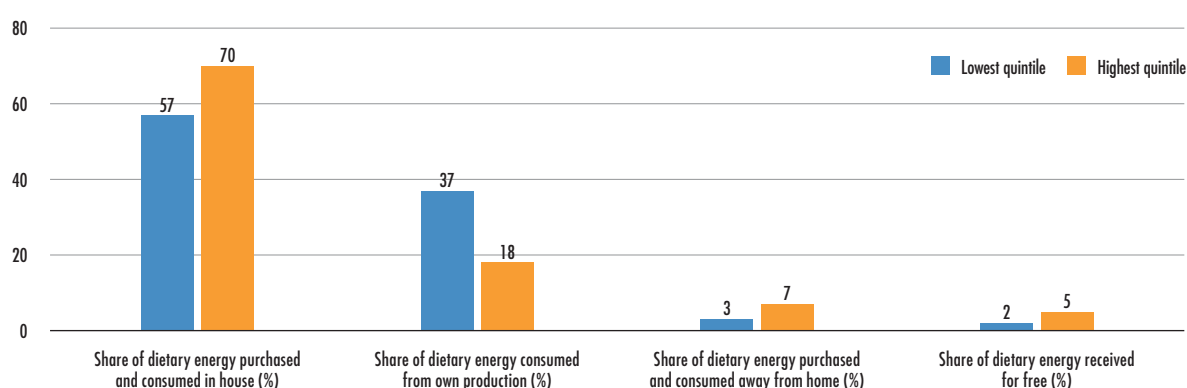
SOURCE: Food data collected in 2018 HIES of Samoa

FIGURE 9**Contribution of each food source of acquisition to total dietary energy consumption**

Contribution of each source of acquisition to the average dietary energy consumed (%)



SOURCE: Food data collected in 2018 HIES of Samoa

Contribution of each source of acquisition to the average dietary energy consumption by expenditure quintile (%)

SOURCE: Food data collected in 2018 HIES of Samoa





CHAPTER 4

COMPOSITION OF THE SAMOAN DIET

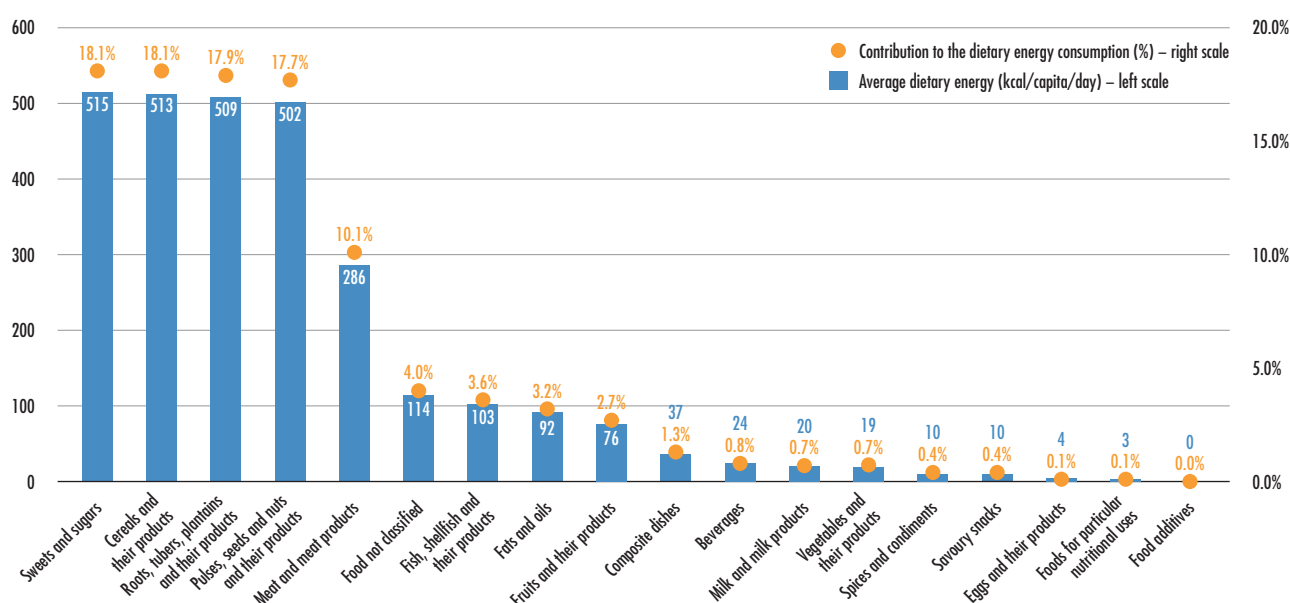
4.1 Contribution of the major food groups to the diet¹⁸

To provide a broad overview of main categories of food products consumed, the products have been categorized into 19 food groups that are relevant for food consumption analysis using food data collected in intake surveys or HCES and following the FAO/WHO Global Individual Food consumption data tool (GIFT).¹⁹ Products are classified based on the ingredients contributing the most to the total energy of the food product (for instance sweet condensed milk is not classified as dairy product but rather as

sweet). Based on this food classification, five main groups are contributing to more than 80 percent of the 2 840 kcal consumed, on average, daily by a Samoan. These five groups are “sweets and sugar”, “cereals and products”, “roots, tubers and plantains”,²⁰ “pulses, seeds and nuts”. Each contributes equally at about 18 percent to the total DEC. Meat and meat products is the next group contributing the most with 10 percent of the DEC, with a share of around 7 percent, fish and fish products together with fruits and vegetables contribute very little to the average DEC (Figure 10)

FIGURE 10
Average dietary energy consumption by food groups

Contribution of each food group to the total dietary energy consumed



SOURCE: Food data collected in 2018 HIES of Samoa

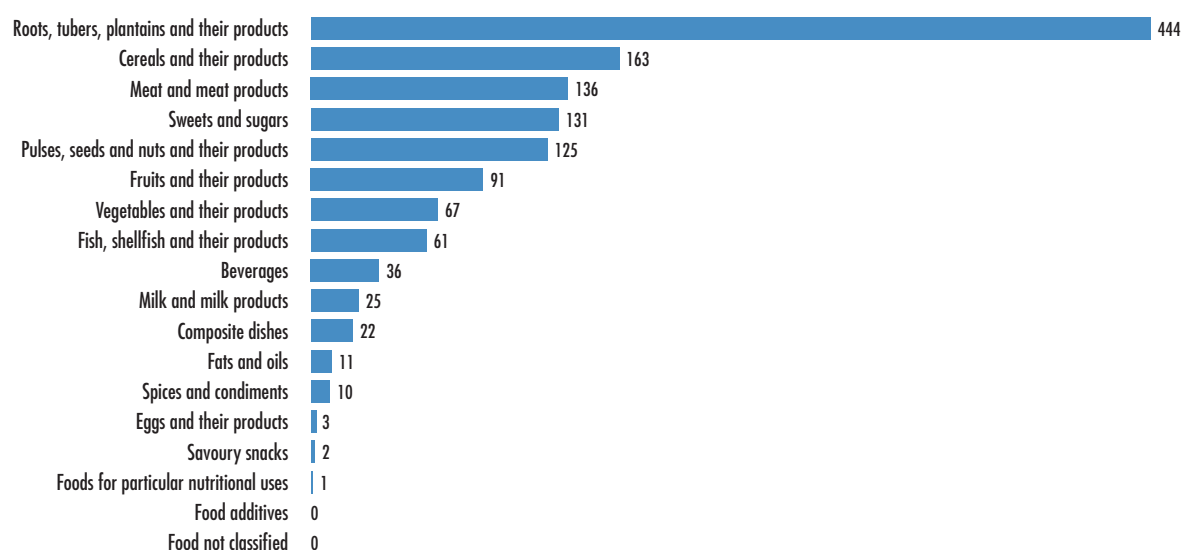
¹⁸ See footnote 14.

¹⁹ The food products are grouped according to FAO nutrition experts who developed the GIFT platform <http://www.fao.org/gift-individual-food-consumption/data-and-indicator/en/>, bringing from FoodEx2 classification. FoodEx2 is a comprehensive food classification and description system aimed at covering the need to describe food in data collections across different food safety domains (<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/sp.efsa.2015.EN-804>).

²⁰ Note that banana raw can be classified either as fruit or starchy food. In FoodEx2 it is assigned to the group of roots, tubers, plantain and their products.

FIGURE 11**Average quantity by food group**

Average edible quantity by food groups (g/capita/day)



SOURCE: Food data collected in 2018 HIES of Samoa

The more energetic the foods, the higher their contribution to total DEC for same quantity consumed compared to less energetic foods. Therefore, in terms of edible quantity²¹ consumed, ranking of food groups may be different. As a matter of fact, the group of roots, tubers and plantain (mainly taro and banana raw) is the main food group consumed followed by the group of cereals (mainly rice) and that of meat (mainly chicken). With a total edible quantity of 154 grams per capita per day, fruits and vegetables consumption altogether is far below the 400 grams per capita per day recommended by WHO (Figure 11).

About 136 grams of meat is consumed on average per day compared to 64 grams of fish, of which half of it is consumed in the form of canned fish.

With an average of 130 grams, the daily consumption of sweets and sugar is quite high considering the latest WHO recommendations to reduce free sugars²² to less than 10 percent²³ of the total energy intake of adults and children.²⁴ Following these recommendations the total dietary energy coming from sugar and sweets should not exceed 300 kcal/capita/day.

There are some huge disparities in average edible quantities consumed of all food groups, excluding that of pulses, nuts and seeds, between poor and rich households (Figure 12). Rich households consume more fatty and sweet foods than poorer households, which exposes rich households to higher risk of being affected by NCDs.

²¹ Edible quantities refer to the quantities as purchased after the non-edible portion has been removed.

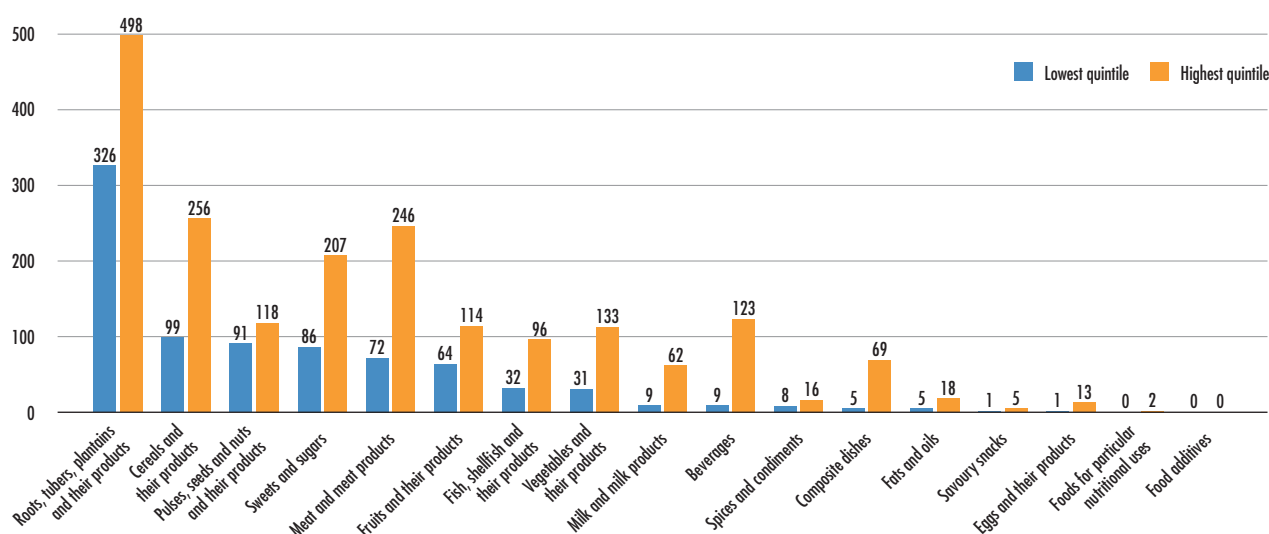
²² The term “free sugars” is used to distinguish between the sugars that are naturally present in fully unrefined carbohydrates such as brown rice, whole wheat pasta, fruit, etc. and those sugars (or carbohydrates) that have been, to some extent, refined (normally by manufacturing processes but sometimes by animals, such as the sugars in honey).

²³ According to Dr Francesco Branca from WHO, there is solid evidence that keeping the intake of free sugars to less than 10 percent of total energy intake reduces the risk of overweight, obesity and tooth decay.

²⁴ This share refers to free sugar but much of the sugars consumed today are “hidden” in processed foods that are not usually seen as sweets (for example one tablespoon of ketchup contains around 4 grams (around one teaspoon) of free sugars).

FIGURE 12
Inequality in quantities consumed between poor and rich households

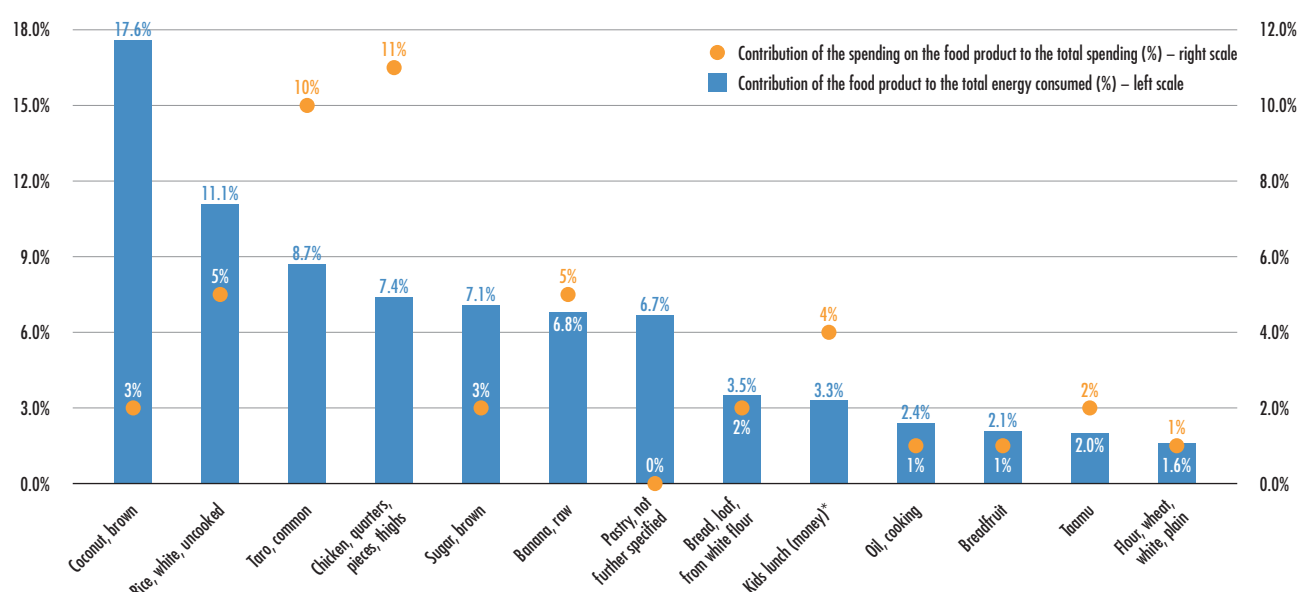
Average edible quantity consumed by households belonging to the lowest and highest expenditure quintile (g/capita/day)



SOURCE: Food data collected in 2018 HIES of Samoa

FIGURE 13
Contribution of main products to the total energy consumed

Contribution to total dietary energy consumed and total spending of the main products contributing to 80% of the total energy consumed



SOURCE: Food data collected in 2018 HIES of Samoa

4.2 Main food products consumed

In terms of products consumed, the Samoan diet is not very diversified. Of the 504 food products reported in the survey, only 13 contribute to 80 percent of the total DEC, and 28 products contribute to 90 percent of the total DEC (Figure 13).

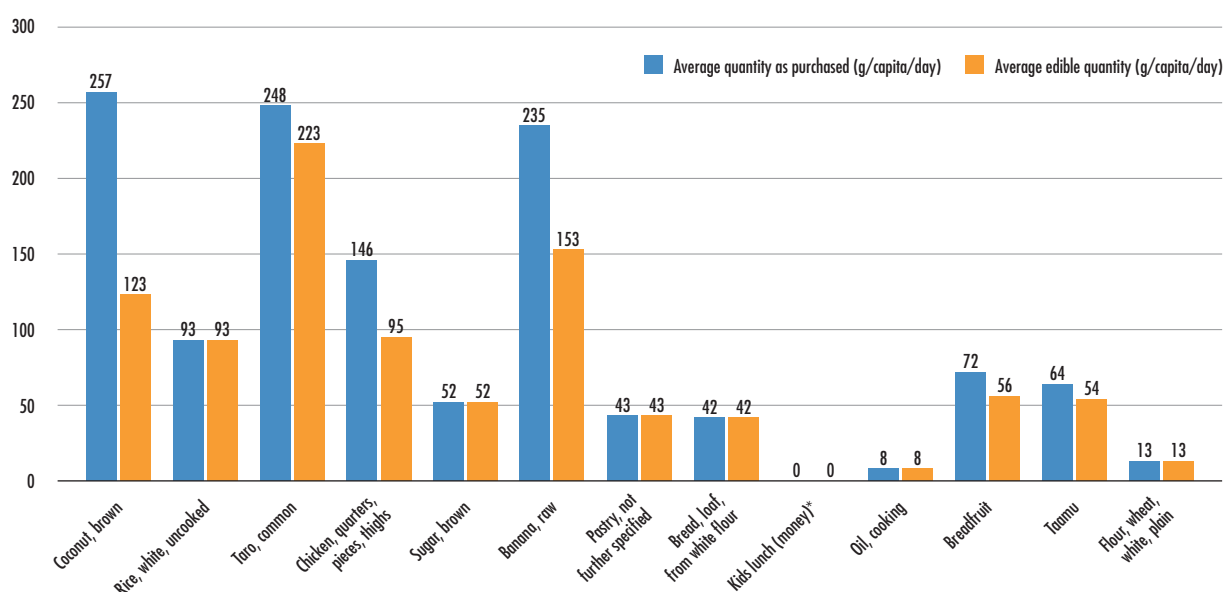
Of these 13 products, coconut brown, rice, taro and chicken quarters contribute alone to respectively 18 percent, 11 percent, 9 percent and 8 percent of

the total energy consumed. While the 13 products contribute to 80 percent of the total dietary energy consumed, they contribute to only 50 percent of the total amount spent to acquire food, with chicken and taro presenting the higher shares, at 11 percent and 10 percent respectively, of the WST 5.4 spent daily on food.

In terms of average daily quantities consumed, after removing the non-edible portions, households consume on average 223 grams of taro (against 247g

FIGURE 14
Average quantities by food products

Average quantities consumed of the food products contributing to 80% of the total dietary energy consumed



SOURCE: Food data collected in 2018 HIES of Samoa

as purchased), followed by 153 grams of banana raw (against 235 grams as purchased), 123 grams of coconut brown (against 257 grams as purchased) and 100 grams of rice and chicken. Compared to coconut brown and rice, which are energy dense and whose contribution to total dietary energy is the highest, taro and raw banana are the most consumed food products in terms of edible quantities. Coconut brown, taro and banana raw are the most consumed in terms of quantities as purchased. With an average edible quantity of 28 grams per capita per day, canned fish contributes to almost half of the edible quantity of fish consumed. Breadfruit and papaya, at respectively 56 grams and 25 grams per capita per day, contribute to 90 percent of the edible quantity of fruits consumed. Pumpkin (16 grams/capita/day), cucumber (12 grams/capita/day), cabbage (11 grams/capita/day), leaves (8 grams/capita/day) and onion brown (8 grams/capita/day) are the main vegetables consumed.

With an average contribution of 2 percent to total DEC and an average edible quantity of 56 grams/capita/day, breadfruit, considered as a starchy food rather than a fruit, is the only fruit or vegetable consumed within the list of those contributing to

90 percent of the DEC (Table 2). Contribution of other fruits and vegetables to total DEC is marginal (2 percent), as these products are dense in micronutrients but low sources of dietary energy. The quantity of milk consumed is also very low at about 23 grams of milk in any form consumed, on average, per capita per day. With a very low contribution of 0.4 percent, whole milk is the only dairy product contributing to the 90 percent of dietary energy consumed.

4.3 Main sources of acquisition of products

As mentioned, purchases and own production contribute respectively to 60 percent and 31 percent of the dietary energy consumed. More than 70 percent of the dietary energy consumed from the groups of roots/tubers/plantain, pulses/seeds/nuts, and fruits and vegetables come from own production. More than 86 percent of dietary energy from meat and 75 percent of the dietary energy from fish and shellfish are purchased²⁵ and 13 percent of dietary energy from fish is received for free.

²⁵ Almost half of the fish consumed is canned or processed.

TABLE 2
Products contributing to 90 percent of the average dietary energy consumed

	Average quantity as purchased (g/capita/day)	Average edible quantity (g/capita/day)	Contribution of the food product to the total energy consumed (%)
Coconut, brown	257.0	123.4	17.6%
Rice, white, uncooked	93.1	93.1	11.1%
Taro, common	247.5	222.8	8.7%
Chicken, quarters, pieces, thighs	145.6	94.7	7.4%
Sugar, brown	51.8	51.8	7.1%
Banana, raw	235.3	152.9	6.8%
Pastry (not further specified)	42.8	42.8	6.7%
Bread, loaf, from white flour	42.3	42.3	3.5%
Kids lunch (money) ²⁶	na	na	3.3%
Oil, cooking	7.7	7.7	2.4%
Breadfruit	71.5	55.8	2.1%
Taamu	64.3	54.0	2.0%
Flour, wheat, white, plain	13.0	13.0	1.6%
Noodles, instant (Maggi-type) dry	8.1	8.1	1.3%
Herring, canned (not further specified)	18.0	14.2	1.3%
Fish (not further specified)	36.6	24.2	1.1%
Bun, sweetened composite	8.4	8.4	0.8%
Biscuits, sweet, all others	4.9	4.9	0.8%
Butter (not further specified)	2.7	2.7	0.7%
Food plates (not further specified) ²⁷	na	na	0.7%
Fish, canned in oil (not further specified)	10.6	8.0	0.6%
Sweets, boiled, hard	3.9	3.9	0.5%
Crackers (not further specified)	2.8	2.8	0.4%
Milk, whole (full cream)	17.4	17.4	0.4%
Sausage (not further specified) raw	5.1	5.1	0.4%
Turkey, wing	10.9	6.6	0.4%
Cocoa, cocoa powder	2.0	2.0	0.3%
Biscuits (not further specified)	2.0	2.0	0.3%

SOURCE: Food data collected in 2018 HIES of Samoa

4.4 Most acquired food and sources of acquisition

In terms of most acquired food products over the 14-day period of the diary, only 15 products had been acquired by at least 50 percent of the households (Figure 15).²⁸ Chicken quarters (92 percent), sugar brown (86 percent), rice (84 percent), bread loaf (80 percent), taro common (78 percent), onion and instant noodles (75 percent) are among the most frequently acquired foods, as more than 75 percent of the households reported having acquired these foods over a two week period in the diaries.

Apart from taro, which is mainly acquired from own production, and chicken quarters, which were received for free by 13 percent of the households, the food products were purchased by more than 95 percent of the households. Among food reported by at least 50 percent of the households, banana raw and coconut brown are consumed from own production for more than 80 percent of the households (Table 4). More than 15 percent of the households that acquired canned fish in the two-week period had received it for free.

²⁶ Dietary energy from money given to kids and food plates were obtained by dividing the amount spent by the median cost of one calorie consumed in the house.

²⁷ Same as footnote 26.

²⁸ The percentage of households that reported having purchased, own produced or received for free a product during the 14 days they filled the diary is a good indicator of access to food. This indicator alone does not say anything about the contribution of the food to the total diet or the frequency of consumption.

TABLE 3

Main sources of acquisition of the 2 840 kcal consumed on average daily per capita by food groups

	Average dietary energy consumption (kcal/capita/day)	Purchased	Own production	Food purchased not clearly specified or consumed away from home	Received as gift
Sweets and sugars	515	98.1	0.1	0.0	1.8
Cereals and their products	513	97.0	0.2	0.0	2.8
Roots, tubers, plantains and their products	509	23.5	73.3	0.0	3.2
Pulses, seeds and nuts and their products	502	25.5	73.3	0.0	1.2
Meat and meat products	286	86.4	5.0	0.0	8.6
Food not classified*	114	0.0	0.0	100.0	0.0
Fish, shellfish and their products	103	75.7	11.1	0.0	13.2
Fats and oils	92	98.9	0.1	0.0	1.0
Fruits and their products	76	23.9	73.4	0.0	2.7
Composite dishes	37	73.8	15.9	0.0	10.3
Beverages	24	94.1	5.1	0.0	0.8
Milk and milk products	20	98.9	0.2	0.0	0.9
Vegetables and their products	19	65.3	32.5	0.0	2.2
Spices and condiments	10	99.1	0.1	0.0	0.8
Savoury snacks	10	98.6	0.1	0.0	1.3
Eggs and their products	4	97.8	0.2	0.0	2.0
Foods for particular nutritional uses	3	99.6	0.0	0.0	0.4
Food additives	0	100.0	0.0	0.0	0.0

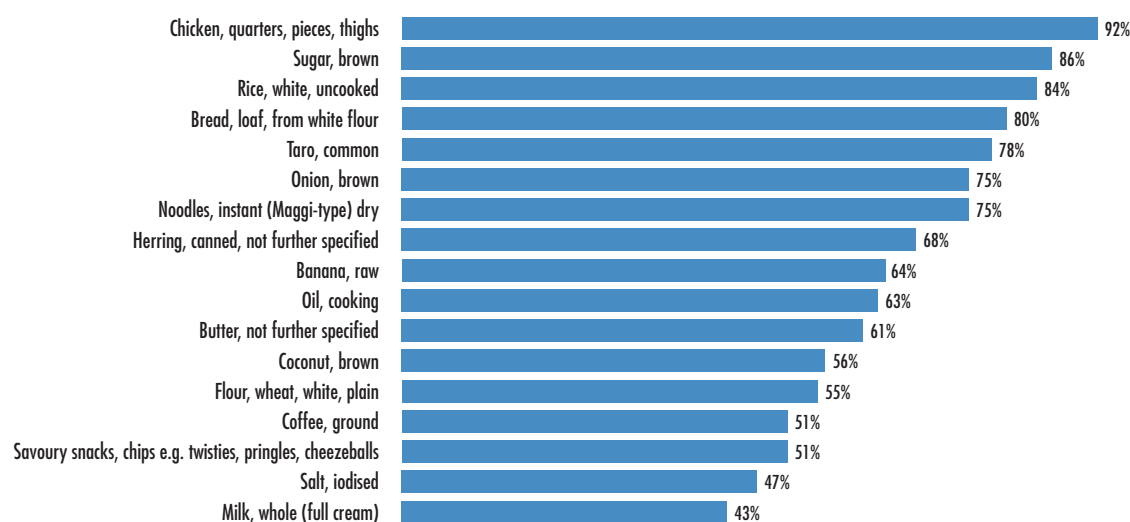
* This food group corresponds to money given to kids, food hampers and other food products for which quantities were not collected and dietary energy was imputed using information from expenses on these foods and the cost of one kilocalorie (kcal) consumed in house.

SOURCE: Food data collected in 2018 HIES of Samoa

FIGURE 15

Products acquired at least once during the last 14 days by at least 50 percent of the households

Percentage of households that acquired the food over the last two weeks



SOURCE: Food data collected in 2018 HIES of Samoa

4.5 Cost of food

The group of pulses, seeds and nuts, dominated by coconut brown, provides the least expensive source of energy, as it cost less than 30 cents to acquire 1 000 kcal from foods belonging to this group (Figure 16).

The most expensive sources of calories, at more than WST 18 per 1 000 kcal, are vegetables and beverages. Sweets and sugars, cereals, fats and oils, and roots, tubers and plantains are also very cheap sources of energy, as with more than WST 1 but less than WST 2 it is possible to obtain 1 000 kcal from these products.

TABLE 4

Main sources of acquisition by percentage of households that have acquired the food products

	Percentage of households having consumed the food from their own production	Percentage of households having purchased the food	Percentage of households having received the food for free	Main source of acquisition	Percentage of households that acquired the food at least once over the last two weeks
Chicken, quarters, pieces, thighs	8%	79%	13%	Purchase	92%
Sugar, brown	0%	97%	3%	Purchase	86%
Rice, white, uncooked	0%	94%	6%	Purchase	84%
Bread, loaf, from white flour	0%	97%	3%	Purchase	80%
Taro, common	67%	27%	5%	Own production	78%
Onion, brown	0%	99%	1%	Purchase	75%
Noodles, instant (Maggi-type) dry	0%	97%	3%	Purchase	75%
Herring, canned (not further specified)	0%	83%	16%	Purchase	68%
Banana, raw	85%	11%	4%	Own production	64%
Oil, cooking	0%	99%	1%	Purchase	63%
Butter (not further specified)	0%	98%	2%	Purchase	61%
Coconut, brown	80%	18%	2%	Own production	56%
Flour, wheat, white, plain	0%	98%	2%	Purchase	55%
Coffee, ground	0%	99%	1%	Purchase	51%
Savoury snacks, chips e.g., Twisties, etc.	0%	98%	2%	Purchase	51%
Salt, iodised	0%	99%	1%	Purchase	47%
Milk, whole (full cream)	0%	99%	1%	Purchase	43%
Biscuits, sweet, all others	0%	98%	2%	Purchase	40%
Fish, canned in oil (not further specified)	1%	84%	15%	Purchase	39%
Cabbage, Chinese	21%	76%	3%	Purchase	39%
Sauce, soy/shoyu	0%	99%	1%	Purchase	39%
Kids lunch (money)	0%	0%	0%	Both sources	38%
Cola flavour soft drink e.g., Coca/Pepsi	0%	99%	1%	Purchase	37%
Biscuits (not further specified)	0%	99%	1%	Purchase	34%
Breadfruit	93%	3%	4%	Own production	32%
Tea, black, bag	0%	98%	1%	Purchase	32%
Taamu	90%	7%	3%	Own production	28%
Pumpkin	52%	43%	4%	Both sources	28%
Fish (not further specified)	43%	44%	13%	Both sources	27%
Koko Samoa (malu, vela)	37%	59%	4%	Both sources	27%
Bun, sweetened composite	0%	98%	2%	Purchase	27%
Leaves, taro	78%	16%	6%	Own production	26%
Soft drinks (not further specified)	0%	99%	1%	Purchase	25%
Curry powder	0%	99%	1%	Purchase	25%

SOURCE: Food data collected in 2018 HIES of Samoa

Of the 13 products contributing to 80 percent of the total amount of energy consumed (see Table 2), coconut brown is, after pastry,²⁹ the least expensive product with an average cost of 5 cents. Coconut brown is also the food product contributing the most to the total dietary energy consumed. With less than 25 cents per 100 grams, banana raw, breadfruit, taamu and taro are the next least expensive foods.

It costs less than 50 cents to acquire 100 grams of chicken quarters. To acquire 100 grams of cereals in the form of rice, wheat flour or bread costs 33 cents. Sugar is also a very affordable product, as 100 grams of sugar costs 33 cents, and it is a cheap source of energy as it costs 84 cents to get 1 000 kcal from sugar compared to an average of WST 6 to get nutritious foods such as papaya or pumpkin.

²⁹ The average price of 100 grams of pastries of all kind is 22 cents compared to a median price of 3 cents, which reflects lot of variability in the price due to the heterogeneous nature of the product.

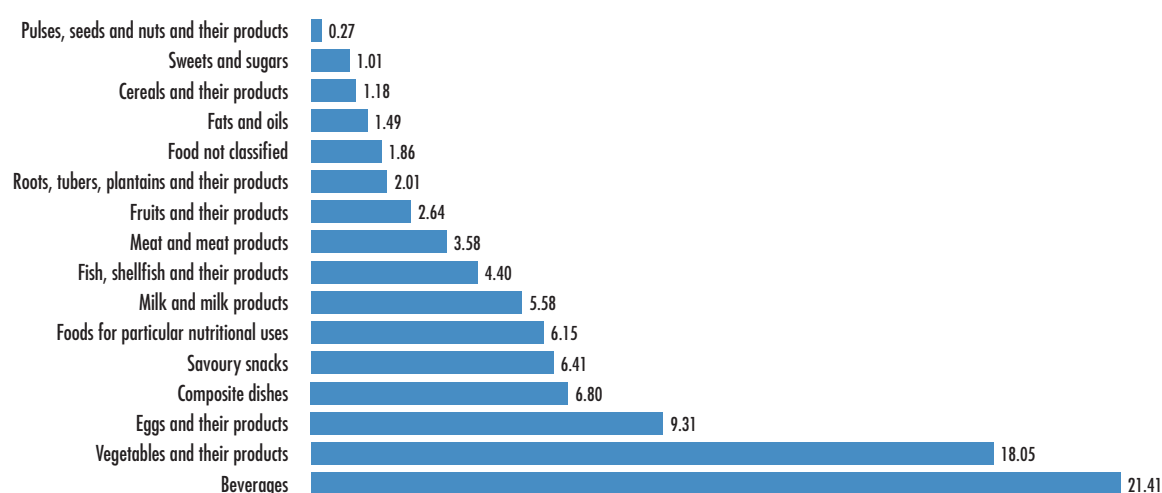
Of the food contributing to 80 percent of the dietary energy consumed, cooking oil is the most expensive, with a median price about 70 cents per 100 grams, but because it is also a very dense energetic food (100 grams of oil brings about 900 kcal), it is also a very cheap source of energy (the cost of 1 000 kcal is almost the same than that of 100 grams). Of the products contributing to 90 percent of the total dietary energy consumed, butter is the most

expensive as it cost about WST 3 to acquire 100 grams of butter (see Figure 17 and Table 7).

Cereals like rice or wheat flour or more energy-dense foods like oils and sugar are very cheap sources of energy, as it costs less than WST 1 to get 1 000 kcal from these products. It would cost more than WST 5 to get the same amount of calories from fish or milk and dairy products.

FIGURE 16
Median unit price of 1 000 kcal by food groups

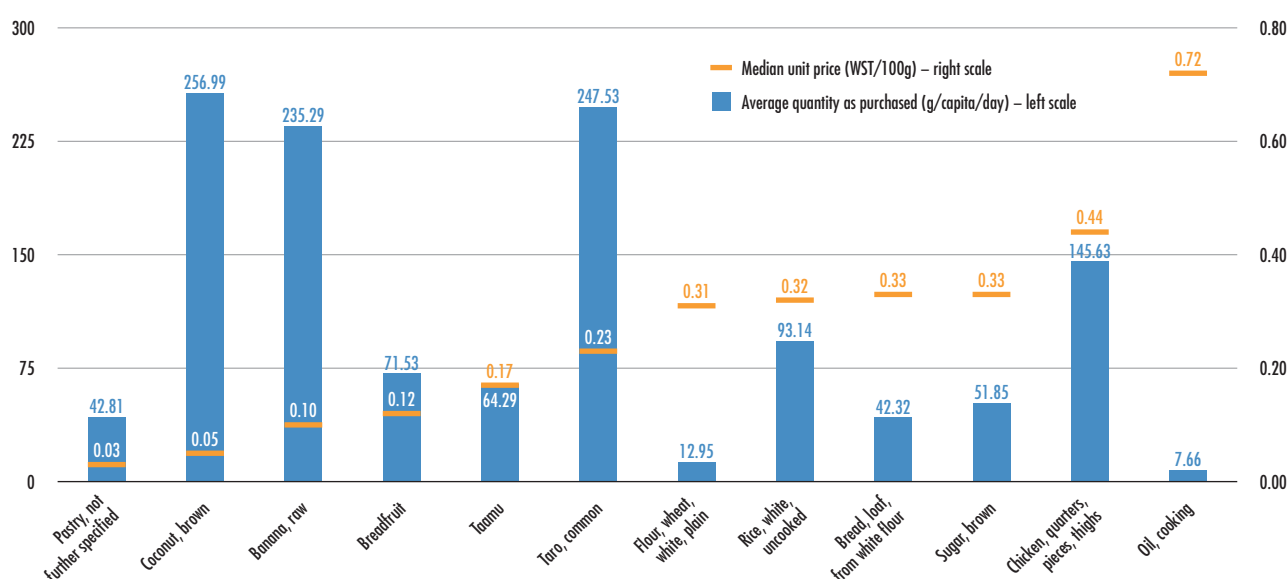
Median dietary energy unit value (LCU/1 000 kcal)



SOURCE: Food data collected in 2018 HIES of Samoa

FIGURE 17
Quantity and median unit price

Average quantity (as purchased) and median unit price of the product contributing to 80% of the dietary energy consumption



SOURCE: Food data collected in 2018 HIES of Samoa

TABLE 5
Median unit cost of the main food contributing to 90 percent of the total dietary energy consumed

	Median dietary energy unit value (WST/1 000 kcal)	Median unit price (WST/100g) – right scale	Contribution to the average amount of dietary energy consumed (%)
Coconut, brown	0.26	0.05	18%
Rice, white, uncooked	0.94	0.32	11%
Taro, common	2.34	0.23	9%
Chicken, quarters, pieces, thighs	2.99	0.44	7%
Sugar, brown	0.84	0.33	7%
Banana, raw	1.24	0.10	7%
Pastry (not further specified)	0.08	0.03	7%
Bread, loaf, from white flour	1.36	0.33	4%
Kids lunch (money) ³⁰	1.85	na	3%
Oil, cooking	0.79	0.72	2%
Breadfruit	1.36	0.12	2%
Taamu	1.93	0.17	2%
Flour, wheat, white, plain	0.88	0.31	2%
Noodles, instant (Maggi-type) dry	2.16	0.97	1%
Herring, canned (not further specified)	3.51	0.71	1%
Fish, not further specified	6.07	0.50	1%
Bun, sweetened composite	0.89	0.26	1%
Biscuits, sweet, all others	1.14	0.53	1%
Butter (not further specified)	4.11	3.03	1%
Food plates (not further specified) ³¹	2.04	na	1%
Fish, canned in oil (not further specified)	4.48	0.71	1%
Sweets, boiled, hard	0.14	0.05	0%
Crackers (not further specified)	1.26	0.53	0%
Milk, whole (full cream)	5.32	0.36	0%
Sausage (not further specified) raw	3.86	0.86	0%
Turkey, wing	5.57	0.55	0%
Cocoa, cocoa powder	0.44	0.20	0%
Biscuits (not further specified)	2.66	1.22	0%

SOURCE: Food data collected in 2018 HIES of Samoa

The amount of dietary energy that can be acquired with only WST 1 is almost half of the dietary energy requirement³² if acquiring only rice or flour (Figure 18). If this WST 1 is spent on acquiring exclusively breadfruit, bread or banana, one third of the average requirement will be already reached. In turn, if this WST 1 is used to acquire exclusively fish or milk, it require spending an additional WST 1 to acquire the 2 350 kcal energy needed to cover

the average dietary energy requirements in Samoa. To reach a healthy diet, it is important to consume a variety of foods belonging to different groups. However, to cover the average requirements through a variety of foods that are together energy dense, protective and body building requires more spending than for an unvaried diet based only on the consumption of dense energy foods.

³⁰ Quantities corresponding to money given to kids or food plates were not collected. Dietary energy from the amount spent on these food items was derived using the median cost of one calorie consumed in the house (median was estimated by area of residence, region and income quintile).

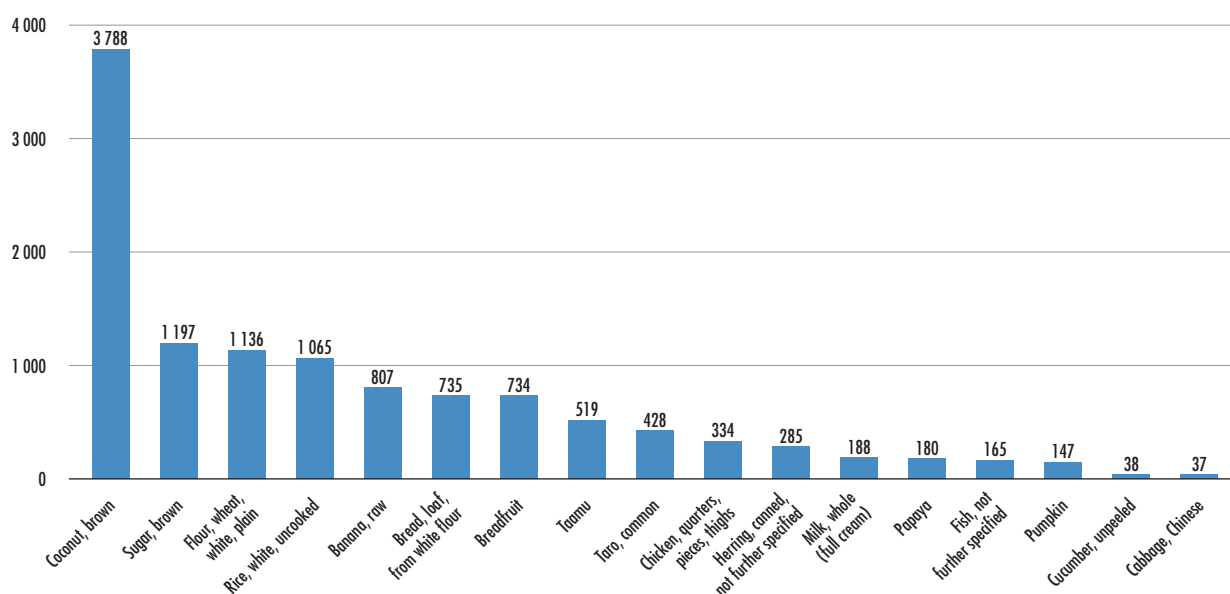
³¹ Same as footnote 26.

³² On the basis of average dietary energy requirements of 2 340 kcal/capita/day in Samoa.

FIGURE 18

Amount of dietary energy that can be obtained from one of these products with one tala

Amount of dietary energy that can be acquired with WST 1 (kcal)



SOURCE: Food data collected in 2018 HIES of Samoa



CHAPTER 5

REGIONAL DISPARITIES

The 2018 HIES was primarily designed to inform the status of poverty in the country and update the weight for the compilation of the consumer price index. It was not designed to conduct an in-depth analysis of food consumption and nutrition. Therefore, the food data collected presents some limitations. For example, data on food away from home was not comprehensively collected in urban areas, and some households reported coconut being used to feed pigs rather than consumed within the household. Whenever possible, the sources of bias were corrected. However, it is believed that some over estimation in rural areas and under estimation in urban areas still prevailed, so that the analysis of disparities at the regional level is shown in terms of patterns rather than levels.

In terms of disparities in accessing a diversified diet, Samoa can be divided into two areas. One area includes Apia and North West of Upolu which have the lowest prevalence of food insecurity and the broadest diversity in food supply, and the other area is the Rest of Upolu and Savai'i, where food insecurity is high in magnitude and severity, and where there is less diversity in food supply. Table 8 summarizes these disparities. In Apia, more than 400 different products were reported while in Savai'i fewer than 300 different food products were reported. The median number of food products acquired by households over a two-week period was 25 in Savai'i compared to about 28 food products in Apia.

In terms of diversity of the diet, only 10 products contribute to 80 percent of the average DEC in Savai'i compared to 20 products in Apia and 14 in North

West of Upolu. It is enough to consume about 20 food products in rest of Upolu and Savai'i to reach 90 percent of the DEC. When looking at the regional edible quantity consumed of the 12³³ food products contributing to the national average DEC, taro, coconut brown, banana raw and breadfruit are the main foods consumed in Savai'i and rest of Upolu. Apart for taro, own production is the main source of acquisition of these food products for more than 90 percent of households in Savai'i and the Rest of Upolu (Figure 18).

In all four regions, taro is the main food consumed in terms of edible quantity but rice is the main source of dietary energy in Apia and North West of Upolu while more than one fourth of dietary energy consumed in the Rest of Upolu and Savai'i comes from coconut brown.³⁴

TABLE 6
Summary statistics on regional distribution of food products reported by households

	Apia	North West of Upolu	Rest of Upolu	Savai'i
Number of food products reported at least once by a household over the last 14 days	426.0	424.0	326.0	295.0
Average number of products reported	28.9	28.5	27.5	26.5
Median number of products reported	28.0	27.0	27.0	25.0
Number of products contributing to 90% of the DEC	45.0	28.0	21.0	19.0
Number of products contributing to 80% of the DEC	20.0	14.0	11.0	10.0

SOURCE: Food data collected in 2018 HIES of Samoa

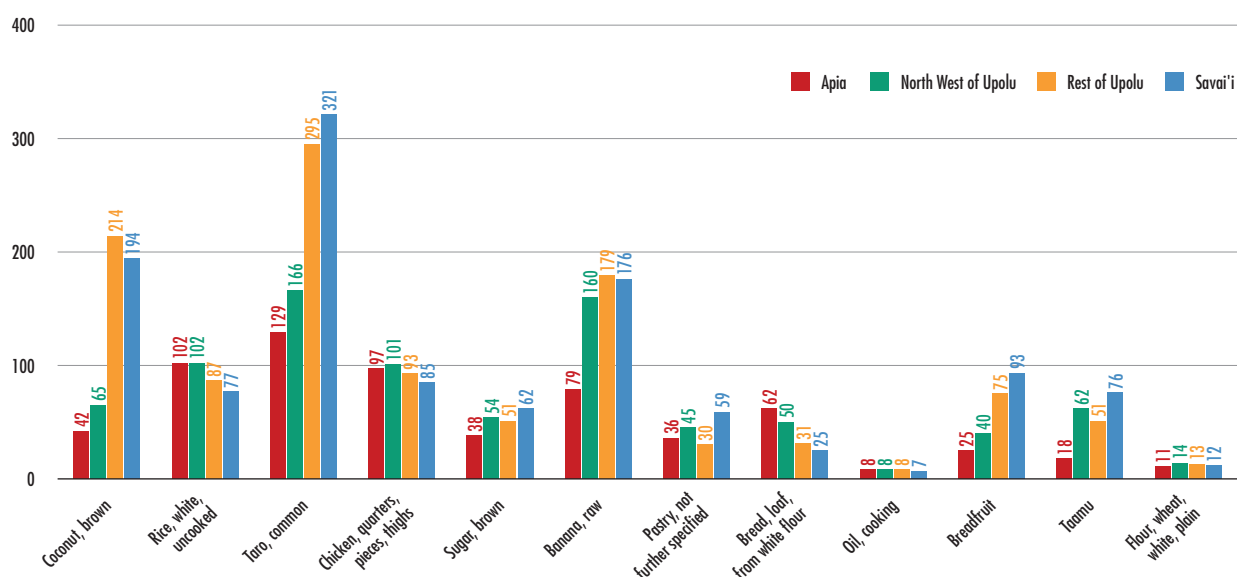
³³ Money given to kids is excluded from the analysis as quantities were not collected.

³⁴ Though it is believed that part of this consumption might be over estimated.

FIGURE 19

Average edible quantity consumed of the 12 products contributing to 80 percent of national DEC by region

Average edible quantity by region (g/capita/day)



SOURCE: Food data collected in 2018 HIES of Samoa

Chicken quarters, rice, sugar brown and onion brown are among the most acquired products, as more than 70 percent of the households acquired these products at least once over 14-day diary period in all regions combined (Table 9). While taro is acquired by more than 90 percent of the households in Savai'i, less than 60 percent of households acquire this product in Apia. More than 60 percent of the households have acquired whole milk in total, however this was acquired by only 46 percent of households in North West of Upolu, 35 percent of households in the Rest of Upolu and less than 30 percent in Savai'i.

To acquire 1 000 kcal, households in Apia are spending WST 2.8 compared to WST 1.9 in Savai'i, which means that households in Apia have access to more diversified source of dietary energy that is less energy dense but more expensive compared to households in Savai'i. Conversely, in Savai'i, more

than half of the budget is allocated to food, compared to 36 percent in Apia. In Apia, food purchased contributes to 80 percent of the total amount spent to acquire food while households in Savai'i and Rest of Upolu food consumed from own production contributes to 40 percent of the total amount spent on food, therefore a stronger reliance to own production.

Coconut brown and pastries in all forms remain the least expensive source of energy in all regions and the most uniformly distributed. Taro, which is the most consumed food product and mainly own produced, costs 40 cents less in Apia than in the other regions. Calories from chicken, rice and cooking oil are more affordable in Apia compared to other regions while dietary energy from breadfruit and banana are less expensive in Savai'i than the other regions.

TABLE 7

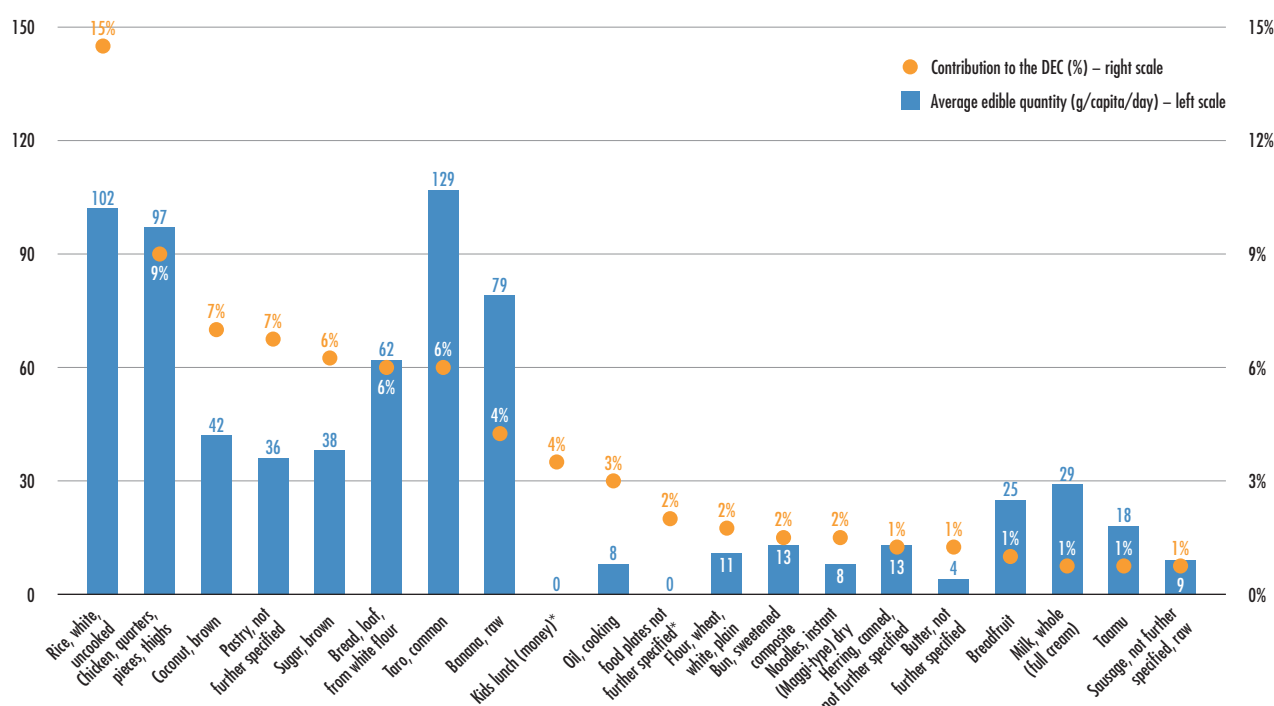
Products acquired at least once the two-week diary period by more than 70 percent of the households

Apia	North West of Upolu	Rest of Upolu	Savai'i
Bread, loaf, from white flour; Chicken, quarters, pieces; Rice, white, uncooked; Sugar, brown; Onion, brown; Butter	Chicken, quarters, pieces; Sugar, brown; Rice, white, uncooked; Bread, loaf, from white flour; Noodles, instant (Maggi-type) dry; Onion, brown; Taro, common; Herring, canned	Chicken, quarters, pieces; Taro, common; Sugar, brown; Rice, white, uncooked; Bread, loaf from white flour; Noodles, instant dry; Onion, brown; Banana, raw; Herring, canned	Chicken, quarters; Taro, common; Sugar, brown; Rice, white, uncooked; Onion, brown; Noodles, instant, dry; Herring, canned; Banana, raw; Coconut, brown

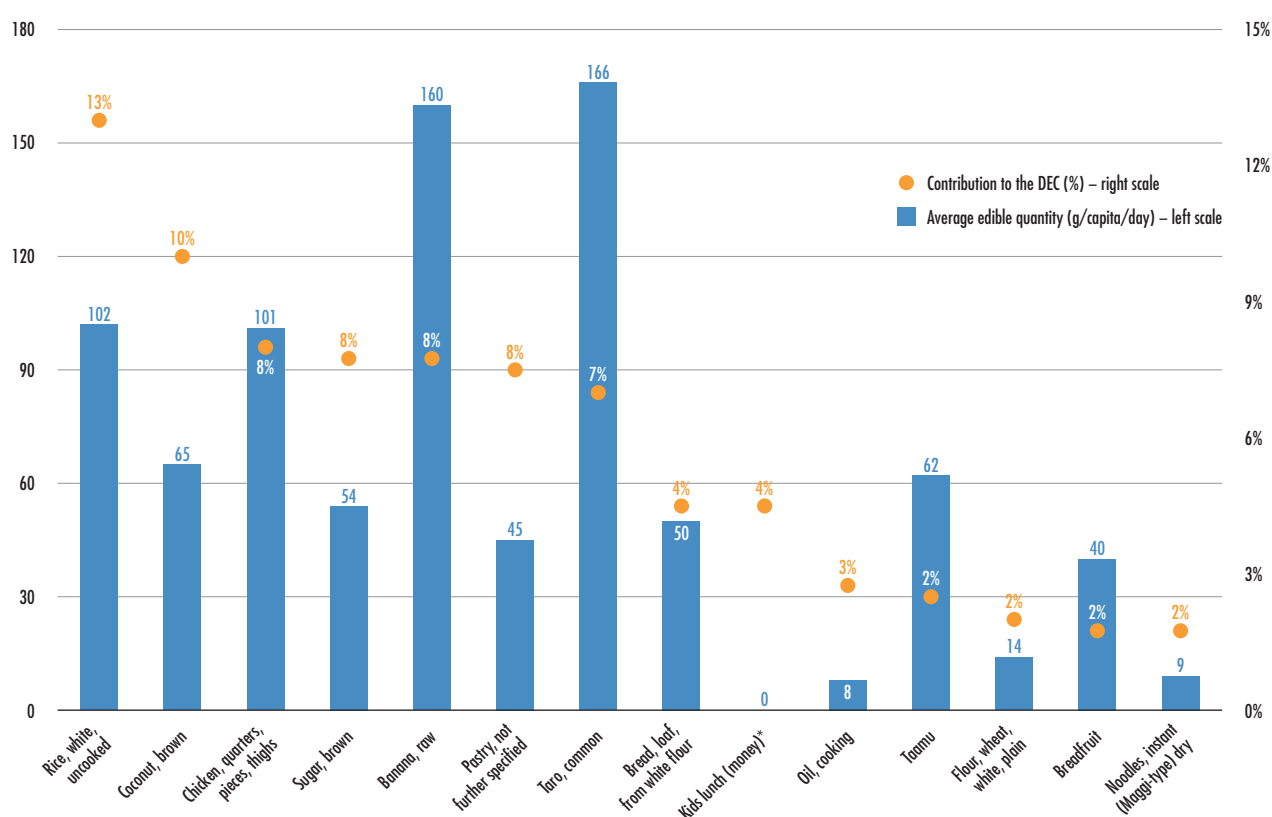
SOURCE: Food data collected in 2018 HIES of Samoa

FIGURE 20

Average edible quantity (g/capita/day) and contribution to the DEC of the products contributing to 80% of the DEC

Apia

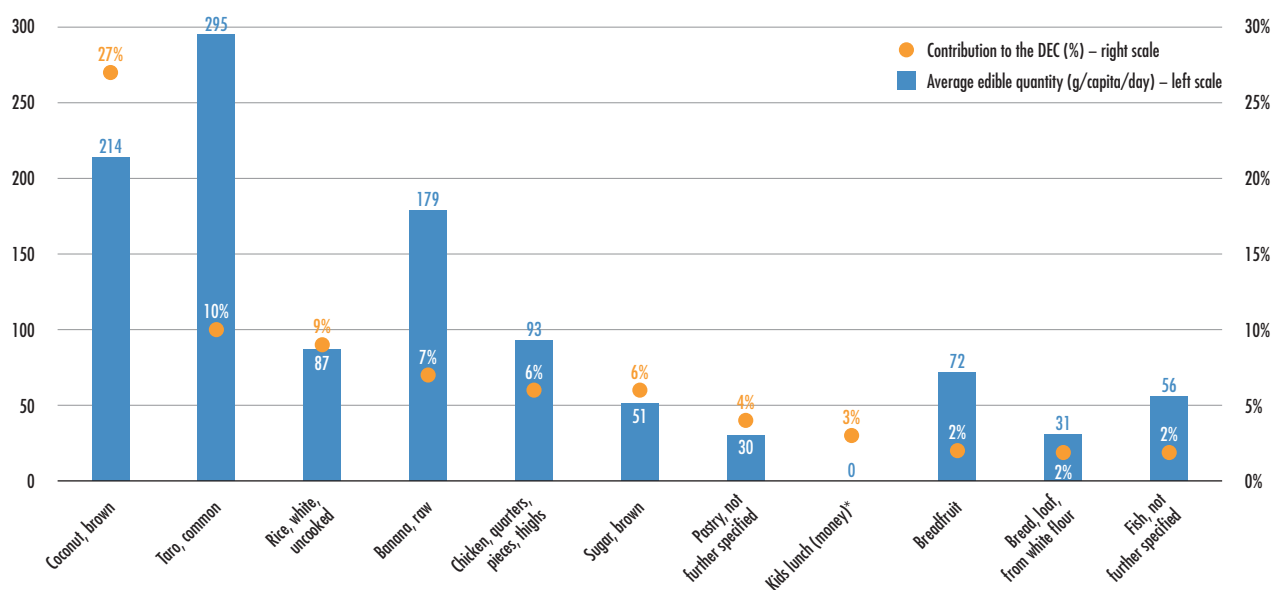
SOURCE: Food data collected in 2018 HIES of Samoa

North West of Upolu

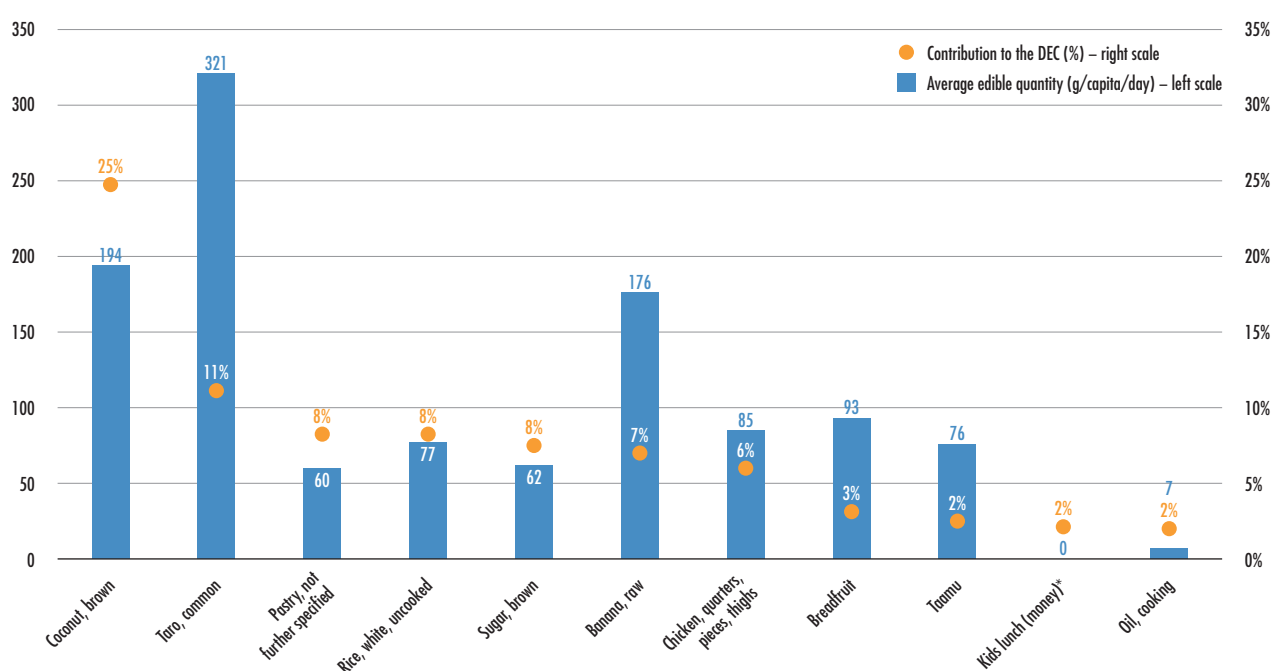
SOURCE: Food data collected in 2018 HIES of Samoa

FIGURE 20 (continued)

Average edible quantity (g/capita/day) and contribution to the DEC of the products contributing to 80% of the DEC

Rest of Upolu

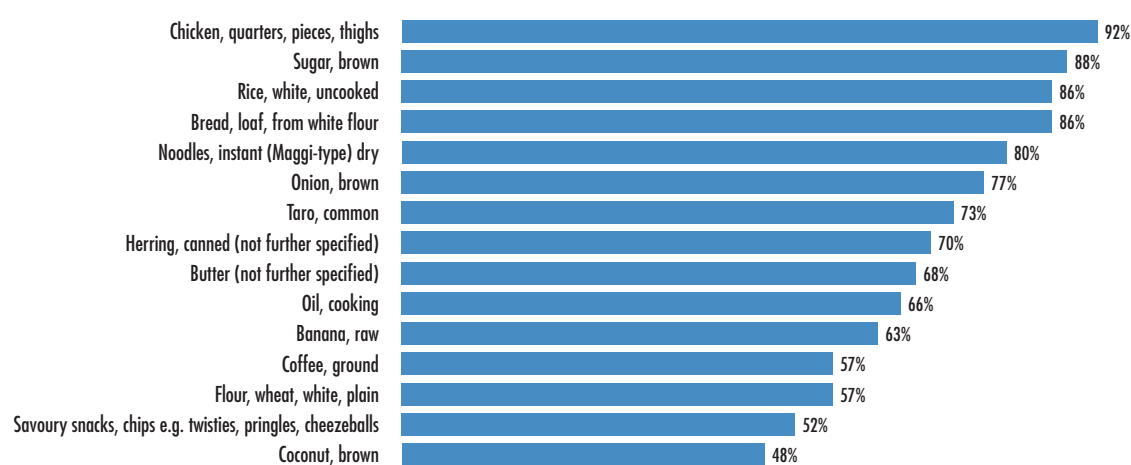
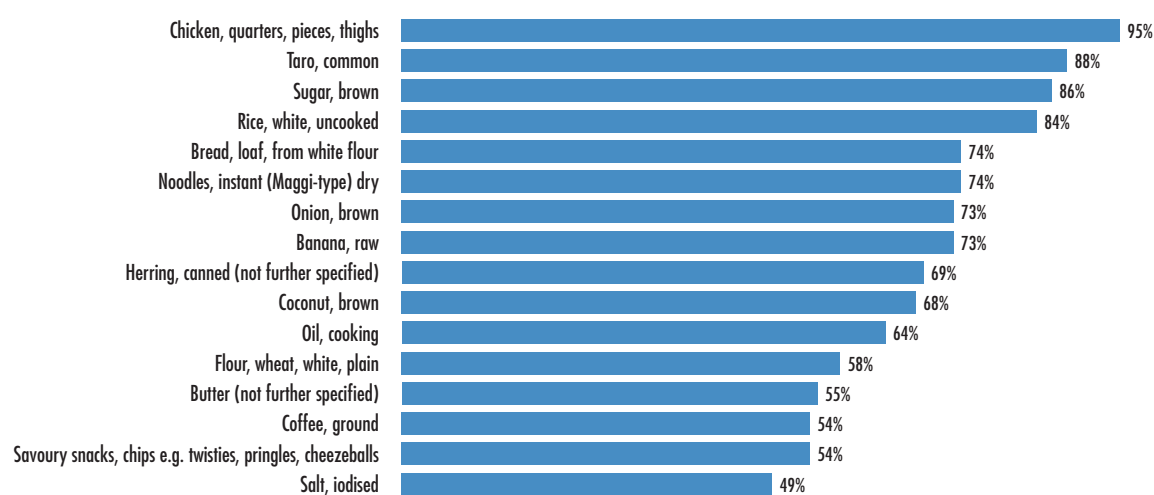
SOURCE: Food data collected in 2018 HIES of Samoa

Savai'i

SOURCE: Food data collected in 2018 HIES of Samoa

FIGURE 21

Food products acquired by at least 50 percent of the households over the previous 14 day diary period

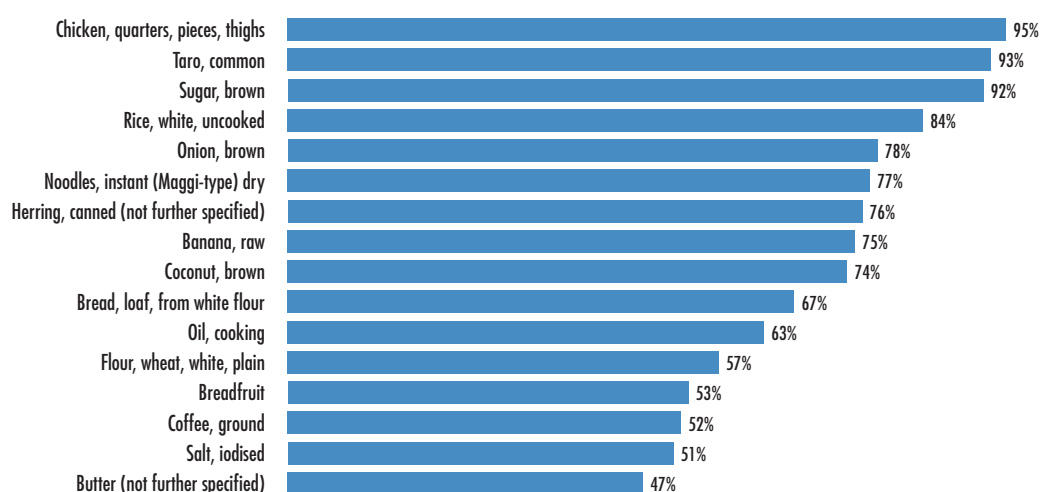
Apia**North West of Upolu****Rest of Upolu**

SOURCE: Food data collected in 2018 HIES of Samoa

FIGURE 21 (continued)

Food products acquired by at least 50% of the households the last 14 days

Savai'i

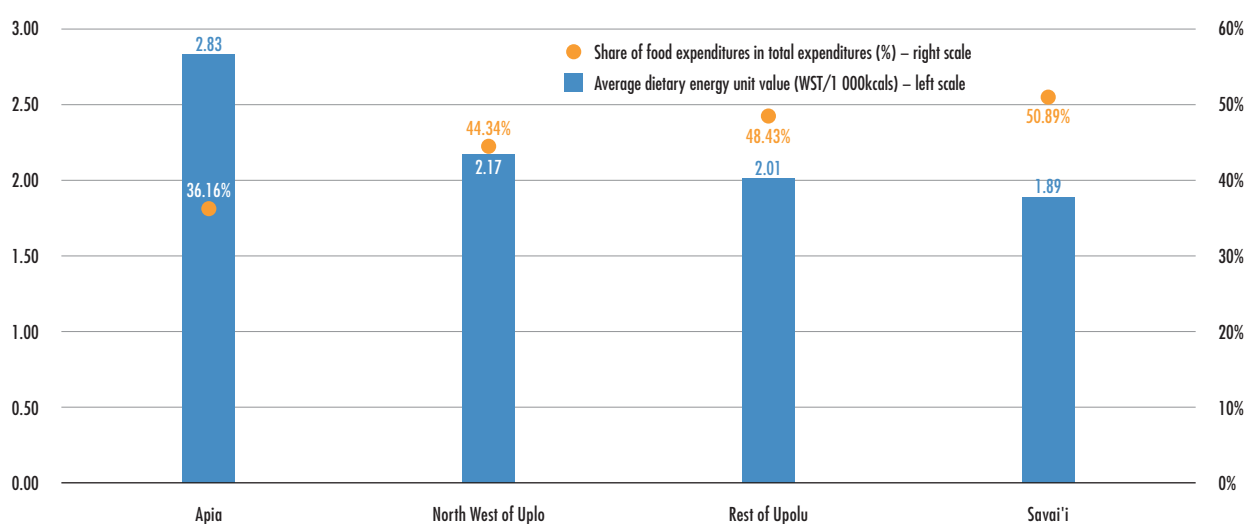


SOURCE: Food data collected in 2018 HIES of Samoa

FIGURE 22

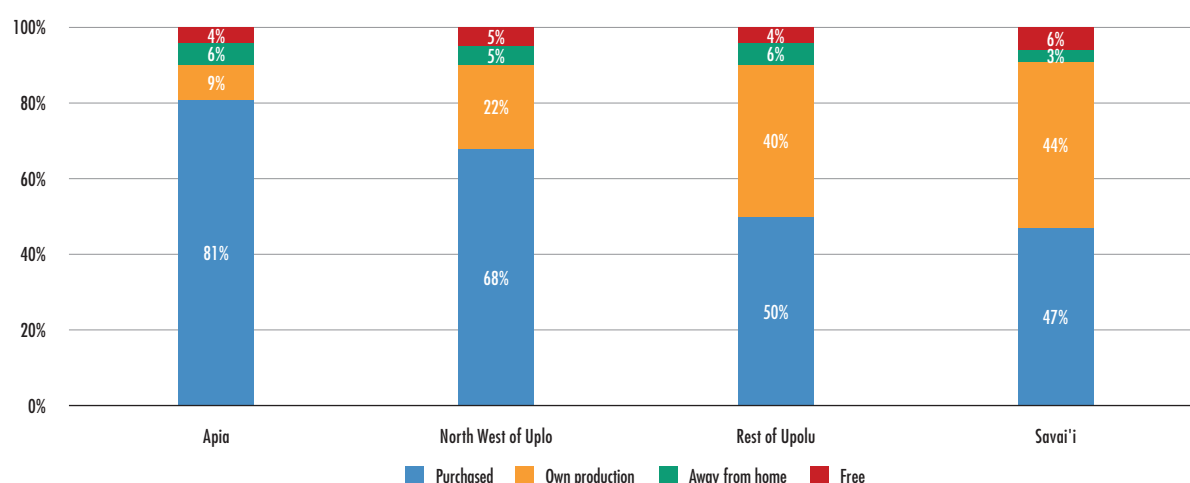
Cost of 1 000 kcal and sources of acquisition

Cost of 1 000 kcal



SOURCE: Food data collected in 2018 HIES of Samoa

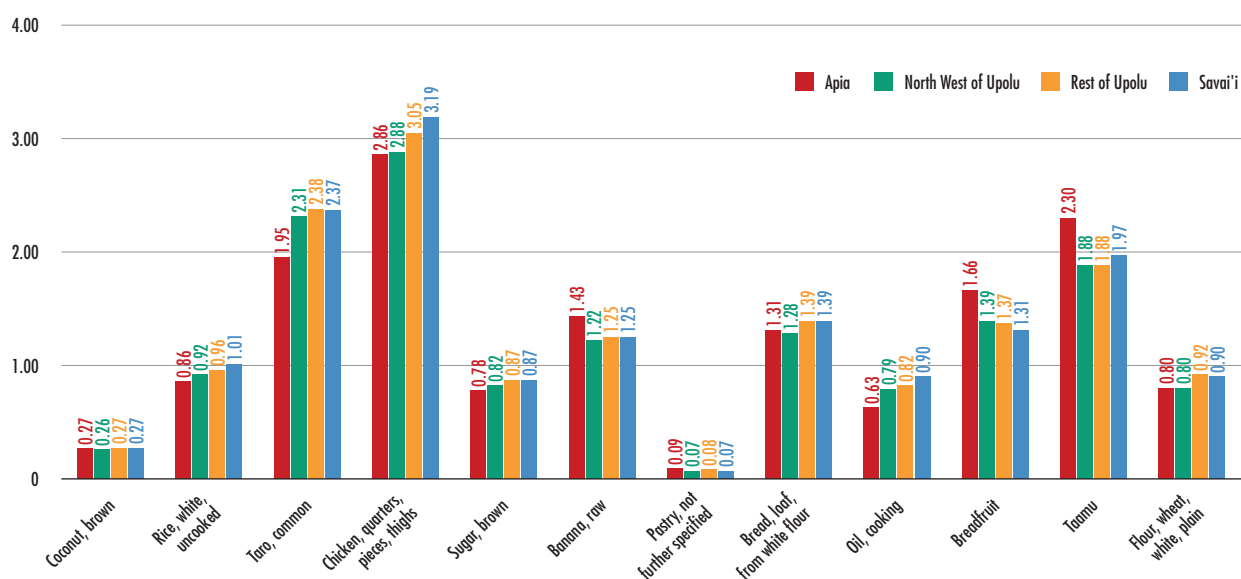
Source of food expenditures (%)



SOURCE: Food data collected in 2018 HIES of Samoa

FIGURE 23
Regional disparities in the cost of calories

Cost of 1 000 kcal of the food products contributing to 80% of national DEC (WST/1 000kcal)



SOURCE: Food data collected in 2018 HIES of Samoa





CHAPTER 6

ANALYSIS OF THE CONSUMPTION OF ESSENTIAL NUTRIENTS

Essential nutrients are composites that the body cannot produce or cannot produce in sufficient quantity and they must come from foods. They are used by the organisms to survive, grow and reproduce. While there are many essential nutrients, they can be broken into two categories: macronutrients and micronutrients.

Macronutrients (protein, carbohydrates, and fats) should be eaten in large amounts and include the primary building blocks of the diet and provide the body with energy. Vitamins and minerals are micronutrients, and small doses usually are sufficient.

6.1 Macronutrients' contribution to the Samoan diet

In Samoa, more than one third of the dietary energy consumed, on average, comes from fats, a share well above the WHO recommendation for a balanced diet.

BOX 1

Essential macronutrients

Carbohydrates are critical to the function of the body. They are broken down into glucose, which is the primary source of fuel for the body and brain. Not only do they provide energy for the body, but they also help stabilize blood sugar levels and preserve muscle mass by preventing the breakdown of proteins for energy. Whole grains, fruits and vegetables are considered as healthy carbohydrates.

Fibre is an indigestible form of carbohydrate. They are not an essential nutrient and therefore an inadequate amount does not result in biochemical or clinical symptoms of a deficiency. However, diets high in fibre have shown decreased risk for obesity, high cholesterol and heart disease. Fruits, vegetables and whole grain products all contain high amounts of fibre.

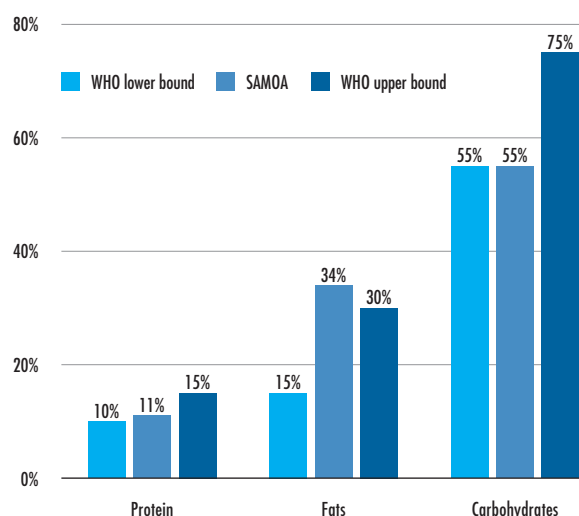
Proteins are critical to good health. From forming muscle to creating new enzymes and hormones, getting enough protein into one's diet is key. Proteins are made up of building blocks called amino acids. There are 20 types of amino acids, all of which are important. While animal proteins provide adequate amounts of all essential amino acids, plant-based proteins are typically lacking in one or more. The best way to ensure adequate protein intake is to include a variety of protein foods in one's diet, such as meat, eggs, dairy, nuts and beans.

Fat is an essential nutrient that provides energy, boosts the absorption of certain vitamins and helps protect organs from damage. However, some types of fat are better than others. Saturated fats, for example, are a type of fat found in red meat, whole milk and other whole-milk dairy foods, cheese, coconut oil, and many commercially prepared baked goods and other foods. A diet rich in saturated fats can increase the risk of heart disease and should be limited to less than 10 percent of the calories a day. Unsaturated fats, on the other hand, actually help protect the heart and aid in the prevention of heart disease. Healthy sources of unsaturated fats include nuts, avocados, salmon, olive oil, flaxseed and nut butters.

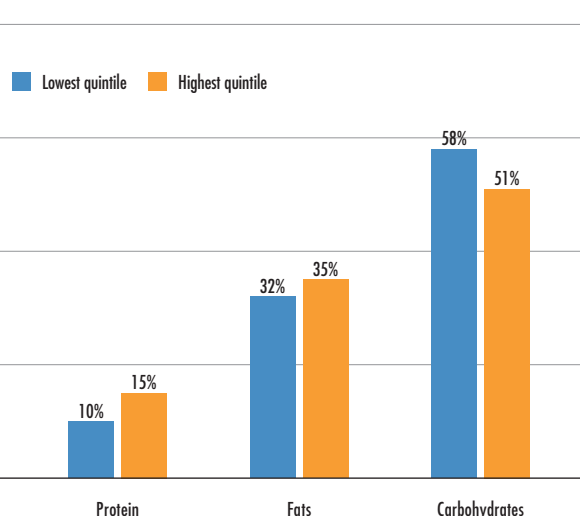
To reach a balanced diet, WHO recommends that, on average, proteins contribute to 10 to 15 percent of the total dietary energy consumed, fats contribute 15 to 30 percent and carbohydrates contribute 55 to 75 percent.

FIGURE 24
Overall diet rich in fats and poor in carbohydrates

Contribution of macro nutrients to the average dietary energy consumed (%)



Contribution of macronutrients to the average dietary energy consumed by expenditure quintile (%)



SOURCE: Food data collected in 2018 HIES of Samoa

In Samoa, carbohydrates bring only 55 percent of the total energy consumed. Proteins contribute to 11 percent of the total dietary energy consumed, of which 47 percent are from animal origin. Chicken quarters are the main source of animal protein. Pulses and mainly peanuts and lentils are very rich sources of non-animal proteins but their consumption is very low in Samoa, with less than 0.2 grams per capita per day (Figure 24).

The average consumption of fibre is just a bit higher than 25 grams/capita/day, which corresponds to the goal recommended by most authoritative institutions.

Contribution of fats to average dietary energy of poor households is lower than that of rich households, and contribution of carbohydrates is higher. Twenty-one percent of individuals living in poor households have access to a diet that meets the three WHO recommended goals for a balanced diet compared to 14 percent of individuals living in richer households.

6.2 Apparent consumption of vitamins³⁵

Vitamins help the body grow and function. There are 13 vitamins – vitamins A, B C, D, E and K. Each vitamin has different jobs – helping resist infections, keeping nerves healthy, and helping the body get energy

from food or blood to solidify properly. Vitamins are divided into fat-soluble and water-soluble categories. Fat-soluble vitamins (such as vitamin A) are found most abundantly in high-fat foods and are better absorbed if eaten with fat. They can be stored in the body for long period of time, while water-soluble vitamins such as vitamin C, vitamin B1 and vitamin B2 cannot. Vitamin B12 is also water-soluble but can be stored longer in the liver.

6.2.1 Vitamin A

BOX 2 Vitamin A

Vitamin A is fat-soluble and is essential for health. It supports cell growth, immune function, foetal development and vision. According to WHO, vitamin A deficiency is the leading cause of preventable blindness in children worldwide, it also increases the severity and risk of dying from diseases such as measles and diarrhoea, raises the risk of anaemia and death in pregnant women, and negatively impacts the foetus by slowing growth and development.

There are two primary forms of vitamin A found in food: one is obtained from foods with beta-carotene (found in certain plant foods, especially those that are orange, red and yellow such as sweet potatoes, kale and cabbage) and the other is retinol (found in certain animal foods like eggs yolks, salmon and organ meats).

³⁵ Here we refer to the amount of vitamins available for consumption by the household. Note that the content and quality of vitamins is affected by the way the food is stored, prepared, processed, held warm or reheated and cooked, and therefore, there may be a considerable difference between the amount and quality of vitamins available for consumption and amount and quality of vitamins ingested.

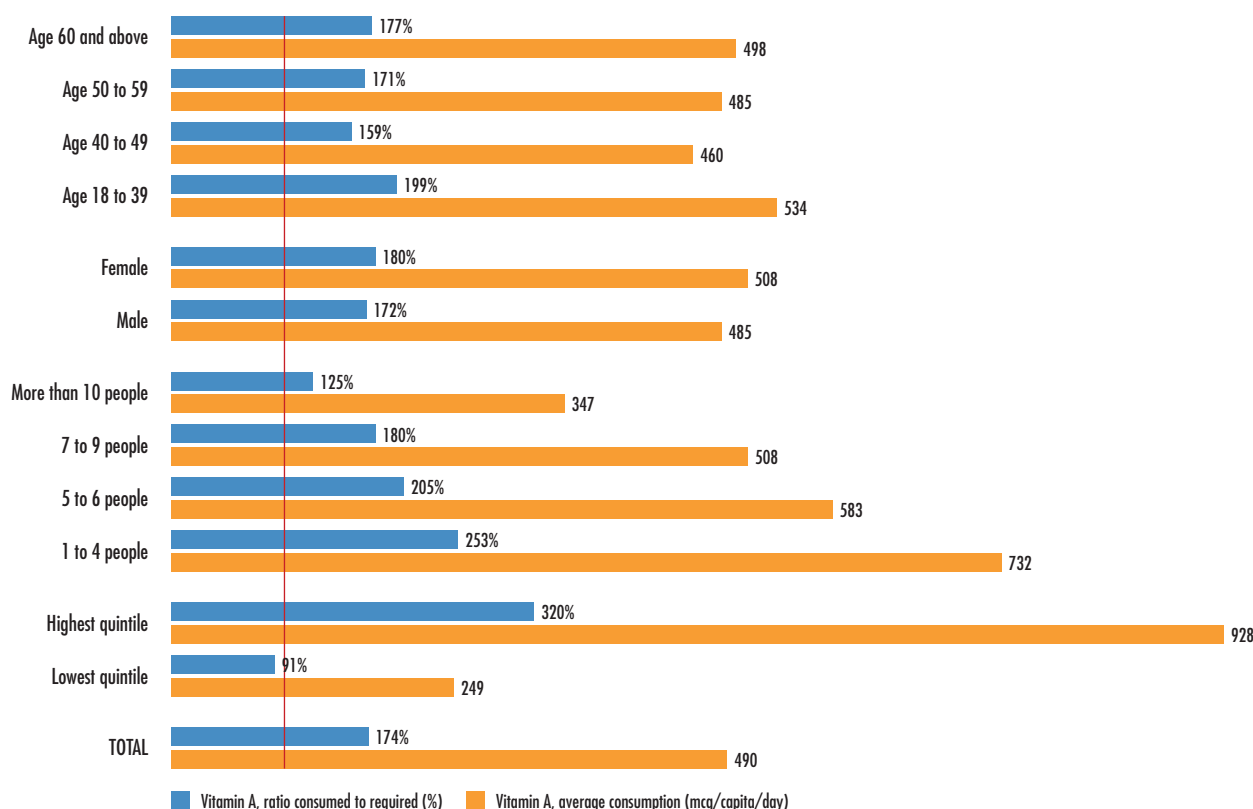
The amount of vitamin A³⁶ available for consumption³⁷ in Samoa is, on average, about 310 mcg per capita per day, which is slightly higher than the average requirements of 282 mcg per day.³⁸ Huge disparities within the population can be observed, as the level of vitamin A available for consumption among the poor population is almost half the requirement while richer households have access, on average, to an amount of vitamin A twice the requirement. The average quantity of vitamin A available for consumption is also well below requirements for large households with many members compared to small households. There is not too much difference between male- and female-headed households or between households whose head is old or young.

Vegetables and their products (mainly pumpkin, cabbage and leaves all sort), and roots tubers, plantain and their products (mainly taro common and banana raw³⁹), with respectively 115mcg/capita/day and 33 mcg/day, contribute together to about 50 percent of the vitamin A available for consumption. Meats and their products, with 44 mcg/capita/day, bring 14 percent of the vitamin A available (mainly chicken quarters⁴⁰).

To increase consumption of vitamin A, Samoan people should consume more dark green leafy vegetables (such as leaves), vitamin A rich fruits, vegetables and tubers (such as carrot, pumpkin and sweet potato) and milk and milk products (butter, milk, cream but in reasonable quantities as these are energy dense foods).

FIGURE 25
Vitamin A available for consumption by population groups

Quantity of vitamin A (RE) available for consumption and ratio of consumption over average requirements



SOURCE: Food data collected in 2018 HIES of Samoa

³⁶ Vitamin A is expressed in Retinol Equivalent.

³⁷ Same as footnote 14.

³⁸ The source for the estimated average requirement used for vitamin A is the FAO/WHO expert consultation on human vitamin and mineral requirements in human nutrition. Second Edition (2004)

³⁹ Taro and banana plantains are not very dense in vitamin A (only 15 mcg per 100 grams of product) but they are highly consumed compared to denser vitamin A food products such as sweet potato.

⁴⁰ 100 grams of chicken quarters contains only 40 mcg of vitamin A but consumption is very high compared to other more vitamin A dense meat products.

6.2.2 Vitamins B group

BOX 3

Vitamins B group

The B vitamins (B1, B2 and B12) are water-soluble, and therefore, do not stay long in the body. After the body uses these vitamins, the amount leftover leaves the body through the urine. B vitamins are important for the metabolism of proteins. They offer the following health benefits:

- Vitamin B1 (thiamine) helps to release energy from foods and is important in maintaining nervous system function.
- Vitamin B2 (riboflavin) helps promote good vision and healthy skin, and is important in converting the amino acid tryptophan into niacin.
- Vitamin B12: helps in the formation of red blood cells and in the maintenance of the central nervous system.

Aside from B12, the body cannot store these vitamins for long periods, so they have to be refilled regularly through food. Vitamin B rich food includes meat, poultry, seafood, eggs, dairy products and fortified cereals.

On average a Samoan consumes 1.02 mcg, 0.80 mcg and 3.23 mcg of vitamins B1, B2 and B12 respectively, and compared to the average requirements⁴¹ adequacy (defined as the average amount of vitamin available for consumption with respect to the average requirements), is met for vitamins B1 and B12 but consumption of vitamin B2 is far below the requirement, with an adequacy ratio of 92 percent.

Disparities can be observed within the population, as rich households, small-size households or households with a head younger than 40 years old are consuming, on average, an amount of vitamin B1, B2 and B12 far above the requirements while for poor households, the apparent quantity of vitamins B1, B2 and B12 is well below the average requirement, with vitamin B12 showing the lowest adequacy (Figure 26).

The group of root foods, tubers and plantain (mainly taro and banana raw, which are not so dense in vitamin B1 but which are consumed in a quantity of more than 500 grams per day), together with groups

of cereals (mainly breakfast cereals and crackers of which quantity consumed represents only 4.12 grams on average a day but for which the content in vitamin B1 is the highest⁴²), sweets (mainly on form of sweet buns of which quantity consumed is on average 8.4 grams per day) and meat (mainly pork of all forms, which is very rich of vitamin B1 and of which quantity acquired is about 5 grams a day), altogether contribute to 73 percent of the total quantity of vitamin B1 consumed.

Roots, meat, cereals, fish (mainly canned) and milk (all forms) contribute altogether to 65 percent of the total apparent quantity of vitamin B2 consumed. To increase the amount of vitamin B2 consumed, it is highly recommended to consume more milk in all forms and breakfast cereals as these food groups are the richest in vitamin B2. However, so far, quantities consumed of food products contained in these groups are very low (less than 18 grams of milk per day and less than 5 grams of cereals per day).

The high level of vitamin B12 observed is mainly due to the high consumption of canned fish (more than 35 grams a day on average) which is very rich in vitamin B12. Fish, shellfish and meat together contribute to 81 percent of the total vitamin B12 consumed. Even if in Samoa, the apparent consumption of vitamin B12 seems to be adequate, it is recommended that poor households, deficient in vitamin B12, consume more shellfish, meat offal and full cream milk powder.

6.2.3 Vitamin C

BOX 4

Vitamin C

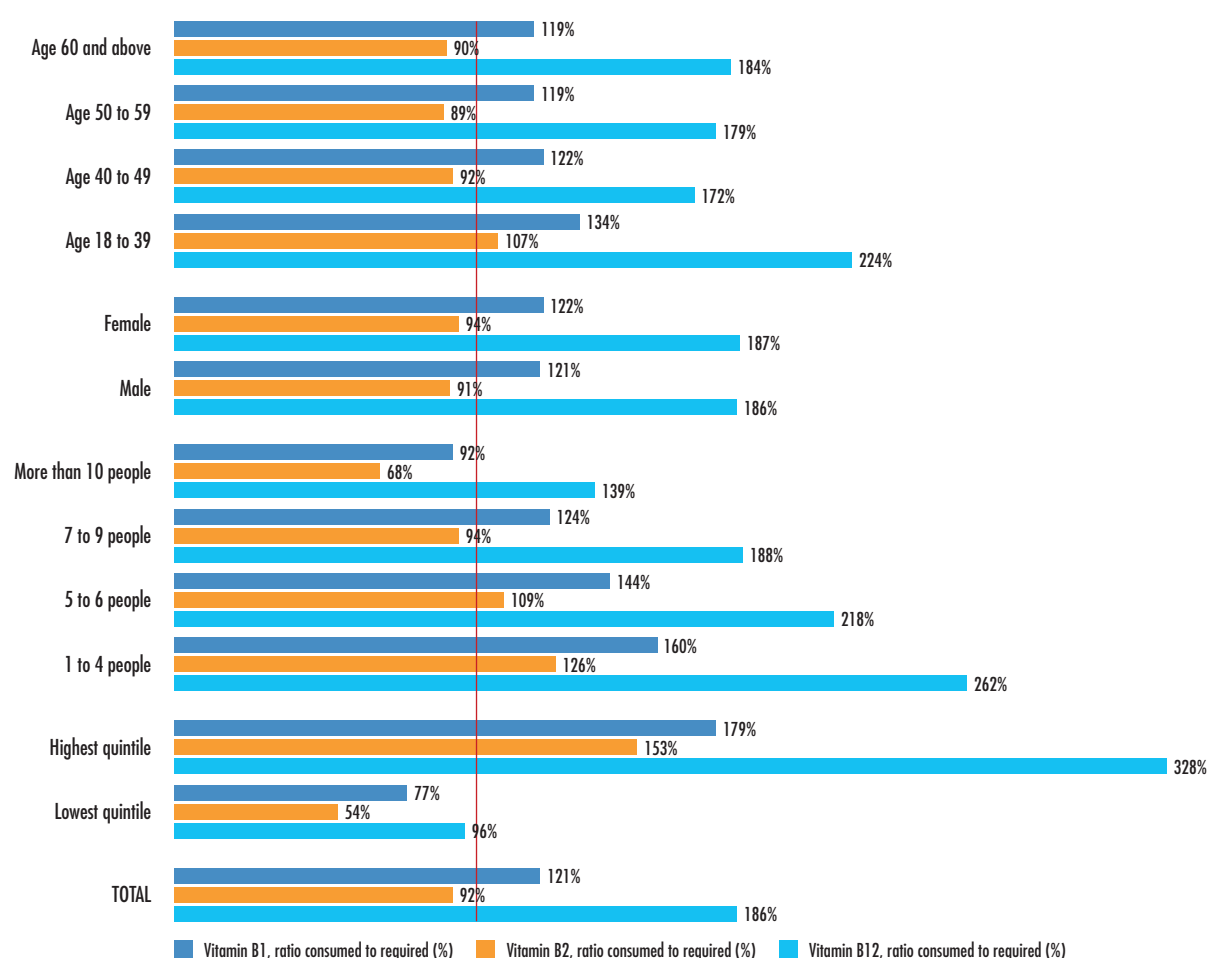
Vitamin C or ascorbic acid is a water-soluble vitamin. It is central to iron absorption and synthesis of the collagen. It aids in wound healing and bone formation while improving overall immune function, for example it is important for defense against infections such as common colds. As vitamin C stimulates system immunization, it is an anti-allergic and antioxidant and a 'cement' for connective tissues, it helps teeth and gum health, and improves iron absorption and eye health. The richest natural sources of vitamin C are fruits and vegetables.

⁴¹ The source for the estimated average requirement used for vitamins B1, B2 and B12 is FAO/WHO expert consultation on human vitamin and mineral requirements in human nutrition. Second Edition (2004).

⁴² Most of breakfast cereals available in Samoa are vitamin fortified.

FIGURE 26
Vitamin B consumption by population groups

Ratio of vitamin B1, B2, B12 available for consumption with respects to requirements (%)



SOURCE: Food data collected in 2018 HIES of Samoa

Vitamin C consumption does not seem to be an issue in Samoa, with average quantity consumed at least three times higher than average requirements.⁴³ Vitamin C adequacy is reached for all population groups. However, poor populations, female-headed households or large-size households tend to present a lower apparent consumption of vitamin C compared to other population groups, but still higher than the average requirements.

Alone, roots, tubers and plantain contribute to more than 50 percent of the total vitamin C consumed, followed by fruits and vegetables that together

contribute together to only 35 percent. Papaya and orange, after guava, are the first two fruits that are rich in vitamin C and the most consumed, with an average consumption of less than 40 grams a day. Among the vegetables that are rich in vitamin C, leaves of all forms and cabbage are the most consumed, with an average consumption of less than 20 grams a day.

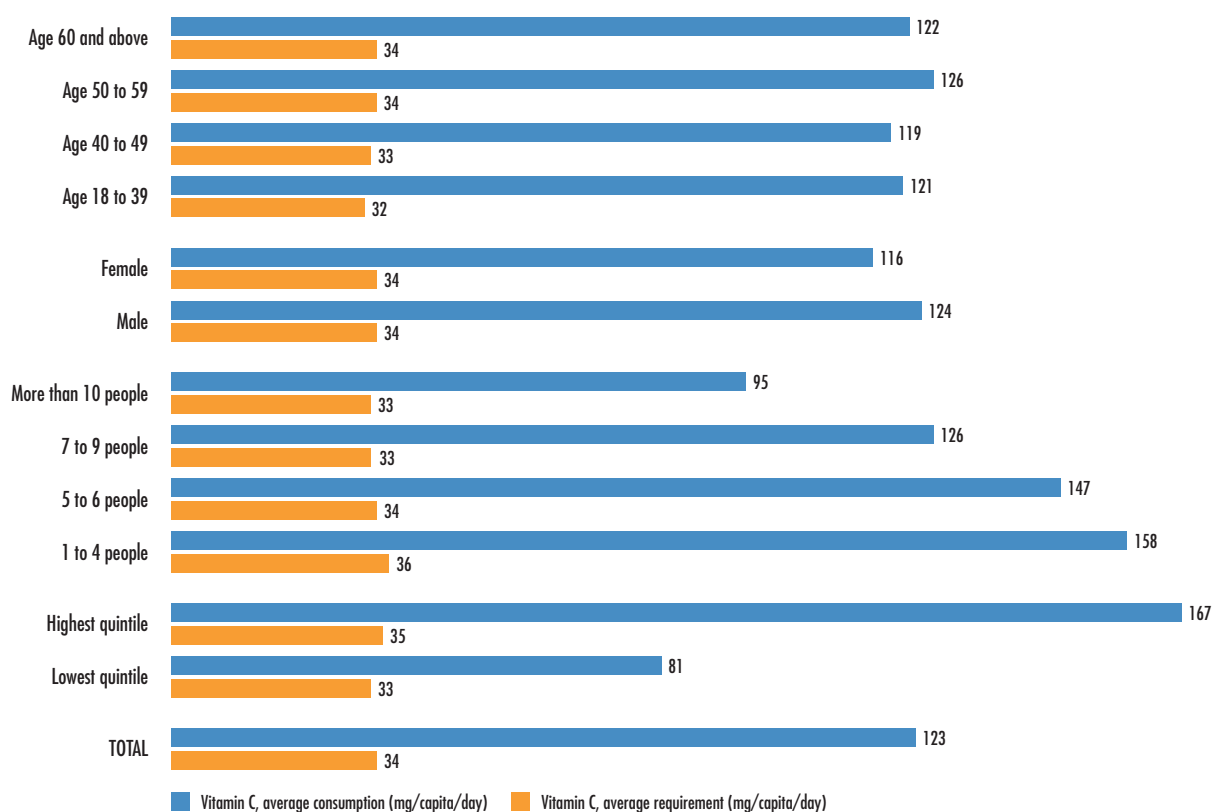
Overall, consumption of fruits and vegetables rich in vitamin C is low in Samoa, as papaya and dark green leafy vegetables are acquired by less than 30 percent of the households.

⁴³ The source for the estimated average requirement used for vitamin C is FAO/WHO expert consultation on human vitamin and mineral requirements in human nutrition. Second Edition (2004).

FIGURE 27

Average consumption of vitamin C and related average requirements by population groups

Vitamin C available for consumption and requirements (mg/capita/day)



SOURCE: Food data collected in 2018 HIES of Samoa



6.3 Apparent consumption of essential minerals

BOX 5

Essential minerals

Minerals are essential nutrients found in many different types of plant- and animal-based foods. Macro-minerals, or those that are required in greater amounts, include calcium, potassium, sodium, phosphorus, magnesium, chloride and sulphur. Trace minerals, or those needed in smaller amounts, include iron, zinc, selenium, manganese, copper, iodine, cobalt and fluoride. Both macro-minerals and trace minerals support a wide variety of bodily functions, ranging from building and maintaining healthy bones and teeth to keeping muscles, the heart and the brain working properly.

• Calcium

Most of the calcium in the body is found in the bones, and its primary role is to promote healthy bones and teeth. The main foods rich in calcium are dairy products such as milk, cheese and yogurt. However, many non-dairy sources, such as seafood, leafy greens, legumes, dried fruit and tofu, are also high in calcium. Foods such as cereal and flour can also be fortified with calcium.

• Iron

Iron is one of the essential nutrients for the proper growth and development of human body. It helps in blood production in the body, particularly in producing haemoglobin, which is used to transfer oxygen from the lungs to the tissues in different parts of the body. Iron deficiency can cause chronic fatigue, weakness, dizziness, inability to concentrate, headaches, depression, sore tongue, increased sensitivity to cold, shortness of breath, and restless leg syndrome. The body cannot produce iron on its own, so to maintain the amount of iron needed in the body, iron rich foods are needed. There are two different sources of iron and the body recognizes the difference between them. These sources are haem and non-haem iron, and the body will absorb each type differently. Haem sources of iron include lean meat, chicken liver, lamb, oysters, tuna fish etc. The bioavailability of haem iron from animal sources can be up to 40 percent.

Non-haem sources of iron mostly refer to vegetables like beans, turnips, leafy vegetables, pumpkins, etc. along with other products like legumes, lentils, dairy products and tofu. Non-haem iron is from plant-based sources, and has a bioavailability between 2 and 20 percent. There are inhibitors and enhancers of iron bioavailability. For example, its bioavailability increases when it is consumed in the presence of ascorbic acid (i.e. vitamin C).

6.3.1 Calcium

In Samoa, average consumption of calcium is around 490 mg per day per capita, which is well below the average requirement of 850 mg of calcium per day. All population groups, without exception, present an inadequate level of calcium consumption (Figure 28).

Milk and milk products that are the most calcium dense contribute to less than 7 percent of the total calcium consumed. Roots and tubers bring 25 percent of the total calcium consumed but only because of the high quantities of taro consumed, as these products are very low in calcium content compared to milk. One hundred grams of powder milk brings 1 250 mg of calcium while 100 grams of taro brings only 32 grams of calcium. Only 43 percent of the households have access to milk, whole full cream and 20 percent to UHT whole milk, and all the other dairy products such as cheese and yogurt are accessed by less than 1 percent of the households.

6.3.2 Iron

A Samoan consumes on average 14 mg of iron per day. Most of the iron consumed is from non-animal origin as the contribution of haem iron to total iron represents less than 20 percent of the total iron consumed. The highest amount of iron is consumed by rich households and almost 27 percent of this iron is from animal origin (Figure 29), while more than 86 percent of the iron consumed by poor households is from vegetables.

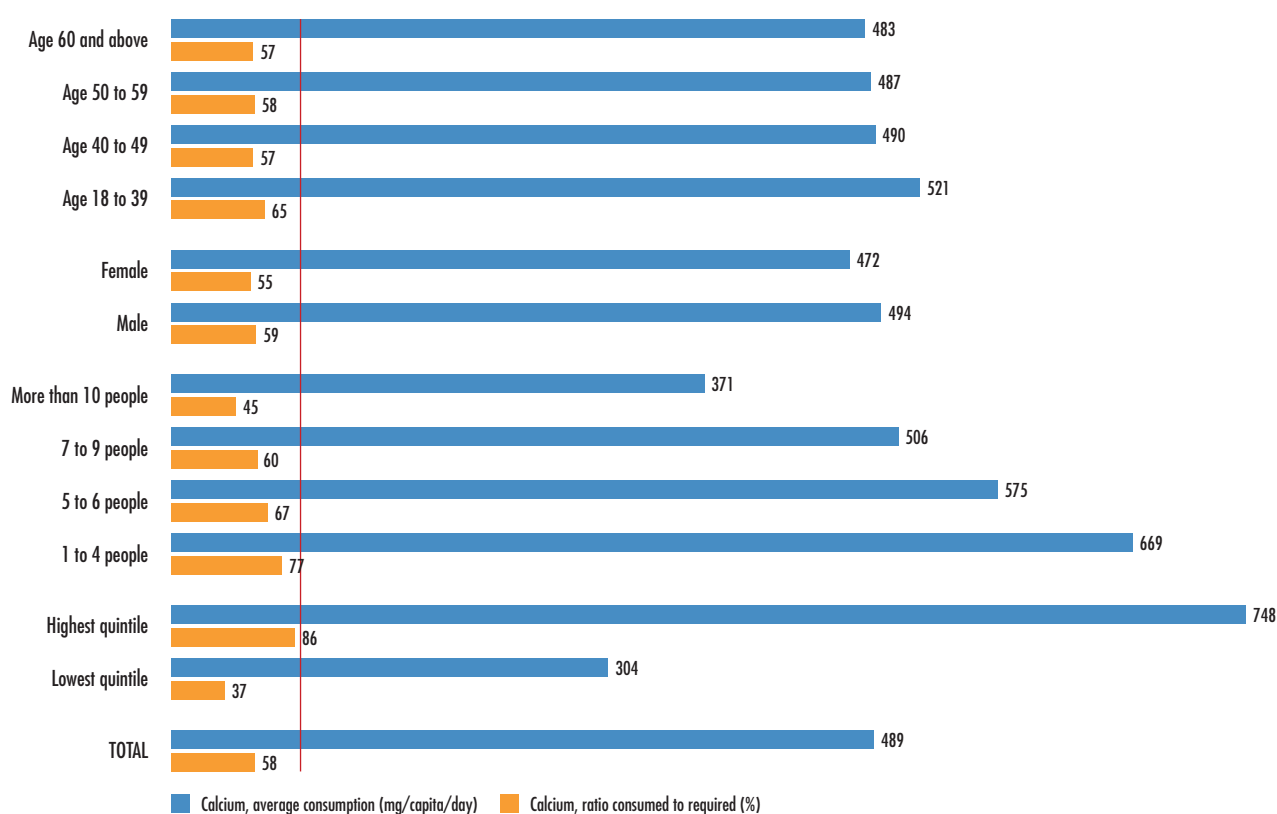
The group of pulses, seeds and nuts (mainly coconut brown) and that of roots tubers and plantain (mainly taro and banana raw) contribute together to almost 40 percent of the total iron consumed. Canned beef, lamb and mutton not further specified are among the top meat products rich in iron with less than 6 grams per day per capita.

To increase amount of iron consumed, it is recommended to eat more pulses like lentils and nuts, such as almonds, as these products are a healthy source of iron. However, it is important to consume these products with other food products rich in vitamin C to enhance iron absorption.

FIGURE 28

Average quantity of calcium available for consumption by population groups

Average consumption of calcium (mg/capita/day) and related ratio of consumption over requirements (%)

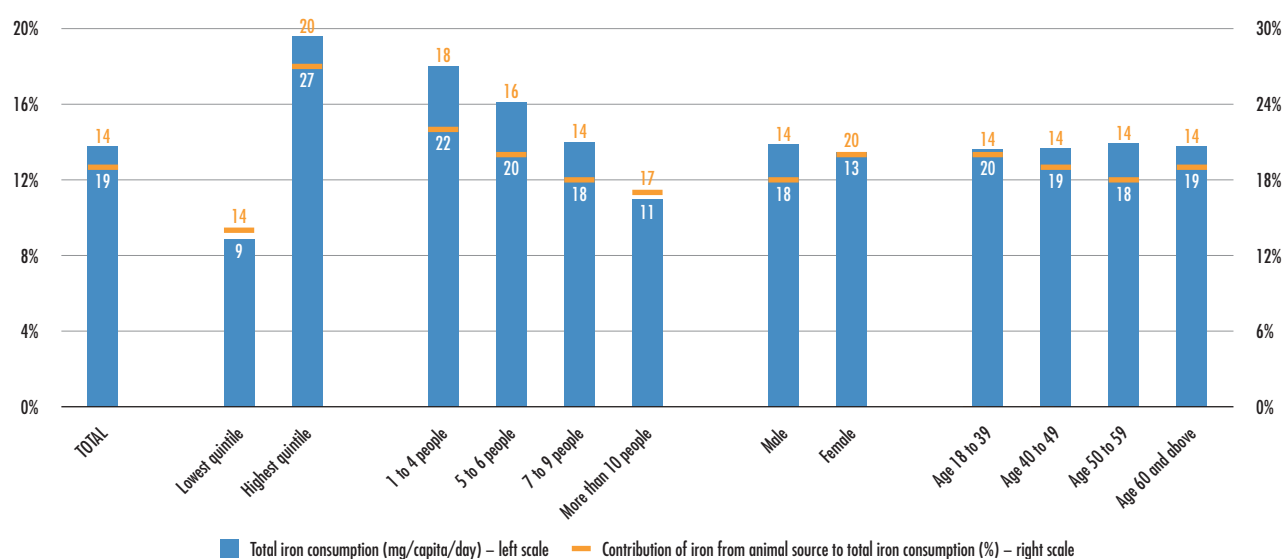


SOURCE: Food data collected in 2018 HIES of Samoa

FIGURE 29

Iron available for consumption by population groups

Iron available for consumption (mg/capita/day) and contribution of iron from animal source to total iron (%)



SOURCE: Food data collected in 2018 HIES of Samoa

CHAPTER 7

CONSUMPTION PATTERNS OF FOOD INSECURE PEOPLE

The FIES performs relatively well in Samoa,⁴⁵ and it was found that about 25 percent of the households did not have access to nutritious foods, and 2.6 percent did not have access to enough food. Therefore, access to enough food does not seem to be a major concern in Samoa but it is rather access to healthy food that seems to be a struggle for one Samoan in four.

This section focuses on the diet of the food insecure. For this analysis, households are considered as food insecure if respondents answered yes to at least three questions out of the eight (see full list of questions in Annex 1.2) associated with FIES in the household survey.⁴⁶ It was found that out of the sample of 2 997 households, 731 were categorized as food insecure.⁴⁷ This analysis focuses only on two groups:

“food secure or mildly food insecure”,
which are households that answered ‘yes’
only two questions; and

“moderately or severely food insecure”,
which are households that answered ‘yes’
to at least three questions.

7.1 Profile of the food insecure

With an average of about 7.5 people compared to 6.7 people, food insecure households are larger than food secure households with a larger number of children, with on average 2.3 children in food insecure households compared to 1.9 in food secure households (Figure 30).

Household members constituting food insecure households are also slightly younger, with an average age of 28 years compared to 30 years in food secure households.

Food insecure households are mainly headed by males, as less than 22 percent of the food insecure households are headed by a females compared to 24 percent of food secure households.

Savai’i is the region with the highest proportion of food insecure households, with one household in three being moderately or severely food insecure. In Apia, more than 80 percent of the households are food secure or mildly food insecure. Rest of Upolu is the region that has the second highest percentage of food insecure households after Savai’i (Figure 31).

In terms of population, Savai’i has 22 percent of the population, and, after Apia, is the least populous region of Samoa, yet it has a concentration of 31 percent of the 6 868 food insecure households estimated for Samoa. With 36 percent of Samoans living in North West of Upolu, this region is the most populous and has a concentration of 30 percent of the national food insecure households.

Average total expenditure (used as proxy for income) is much lower among food insecure households at WST 11 per capita per day, than food secure households, which have a national average of WST 15 a day, and the WST 17 per capita per day exhibited by food secure households (Figure 32).

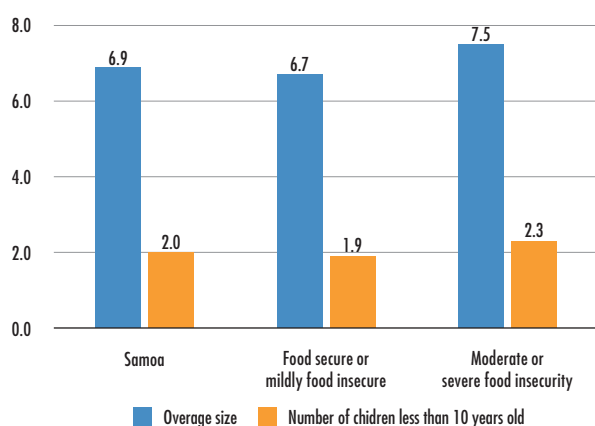
⁴⁵ However the question related to "healthy food" did not pass the statistical validity test and therefore the prevalence of food insecurity at moderate and/or severe levels was estimated using the seven remaining items.

⁴⁶ This means that whenever a household have reported at least three experiences of food insecurity, ranging from being worried about not having access to food to really experiencing hunger, this household is considered as food insecure. The threshold fixed to three positive answers was set after having demonstrated that the score is an ordinal measure of food insecurity (i.e. a score of 3 refers to a more food insecure household than a score of 2) and after equating the Samoan scale to the global scale.

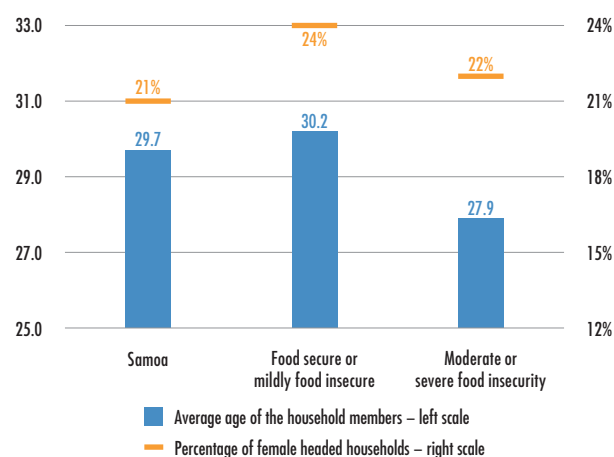
⁴⁷ That is 24 percent of the households which is slightly different (but still very close) to the SDG 2.1.2 on the estimate of prevalence of moderate or severe food insecure households, as this estimate is the cumulative sum of the prevalence around each score (for more information refer to e-learning course: <https://elearning.fao.org/course/view.php?id=360>).

FIGURE 30
Demographic characteristics of food insecure households

Average size and composition of the household



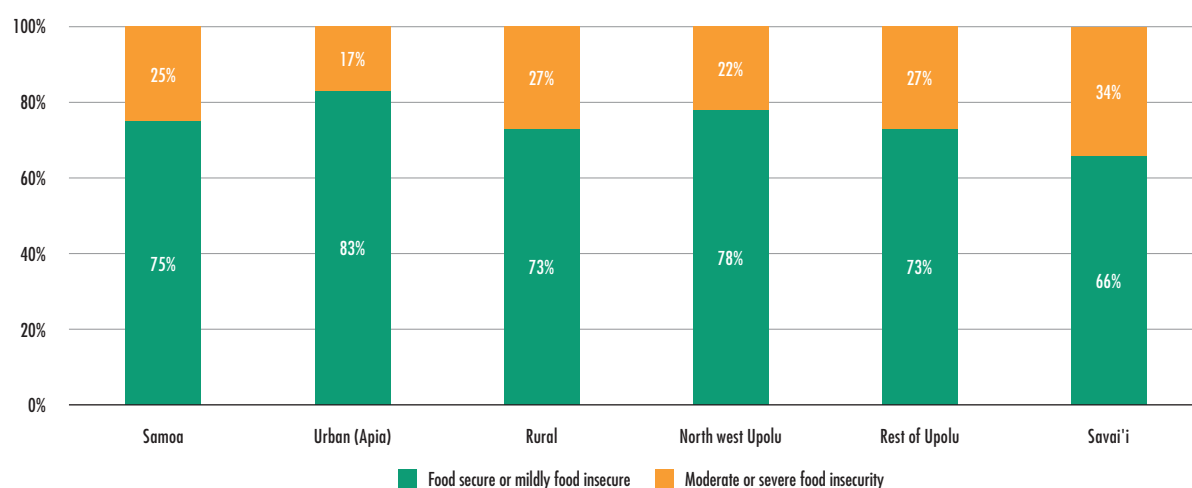
Average age of the household members and percentage of households whose head is a female



SOURCE: Food data collected in 2018 HIES of Samoa

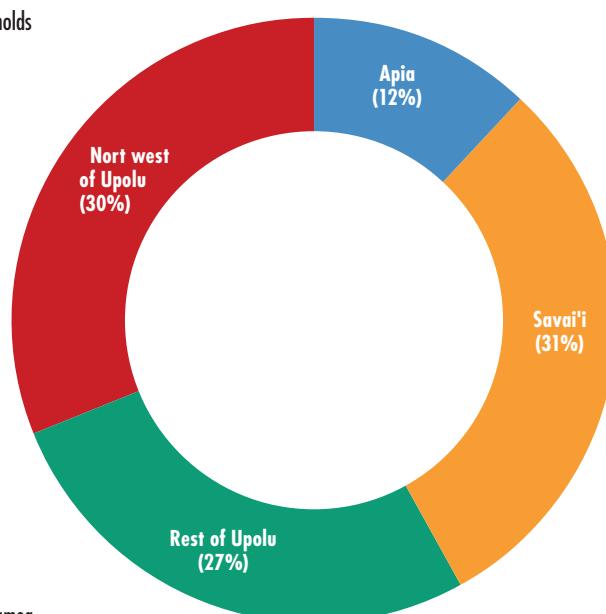
FIGURE 31
Percentage of households by level of food insecurity and region

Regional distribution of households by severity of food insecurity (%)



SOURCE: Food data collected in 2018 HIES of Samoa

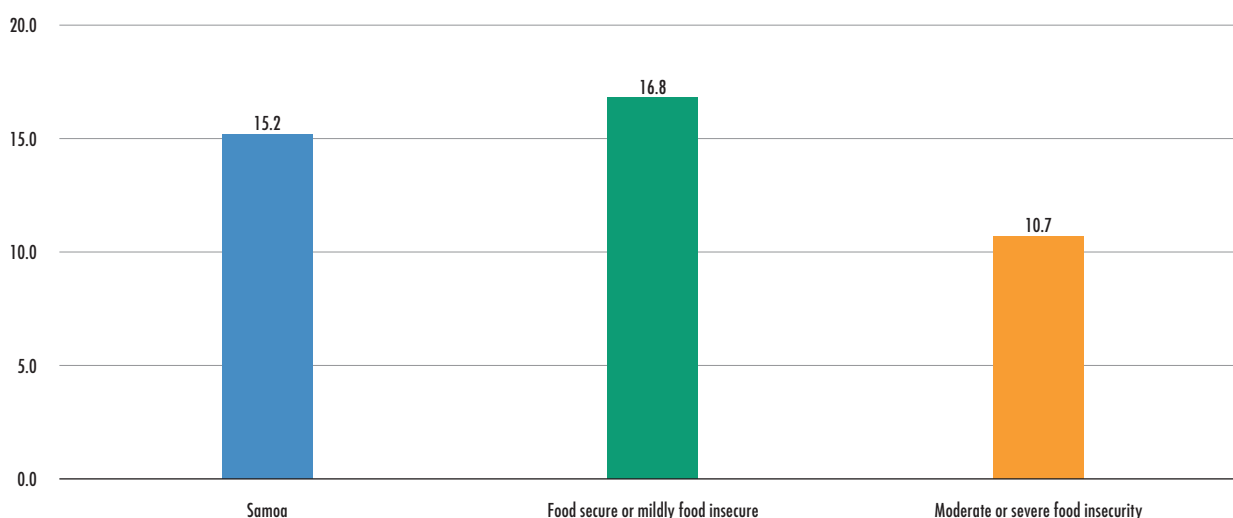
Regional distribution of food insecure households



SOURCE: Food data collected in 2018 HIES of Samoa

FIGURE 32
Distribution of average total expenditures

Average total consumption expenditures in monetary value (WST/capita/day)



SOURCE: Food data collected in 2018 HIES of Samoa

7.2 Composition of the diet

Food insecure households consume on average 100 kcal per capita per day less than food secure households but the amount of dietary energy still remains high and well above the average requirements. Therefore, not having access to enough calories cannot be considered as the main feature of food insecure people. *It is rather the lack of access to safe and nutritious foods that seems to characterize food insecure people.* Indeed, to acquire

1 000 kcal, food secure people will spend on average WST 2.3 while food insecure will spend 30 cents less to acquire the same amount of energy (Figure 33).

Moderate or severe food insecure households spend, on average, WST 4.9 on food, which is more than 50 percent of total expenditures, whereas food secure households spend on average WST 5.6 on food, which represents about 43 percent of total expenditures (Figure 34).

FIGURE 33
Amount of dietary energy consumed by food insecure slightly lower

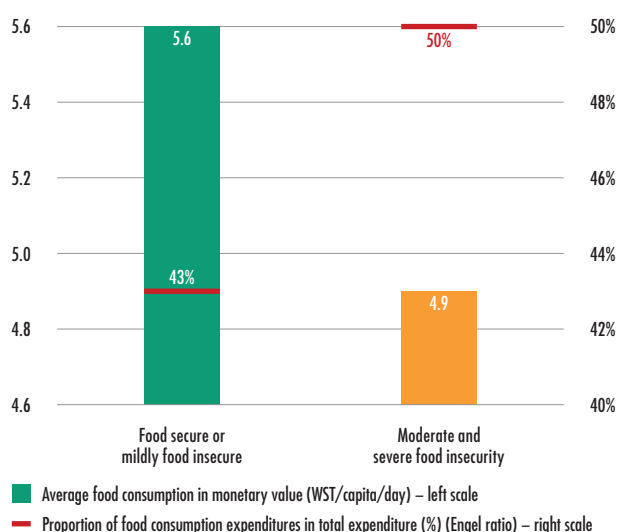
Average dietary energy consumption (kcal/capita/day) and average cost of 1 000 kcal



SOURCE: Food data collected in 2018 HIES of Samoa

FIGURE 34
Cost of kcal and amount spent on food

Average amount spent on food (WST/capita/day) and share of food expenditures over total expenditures (%)



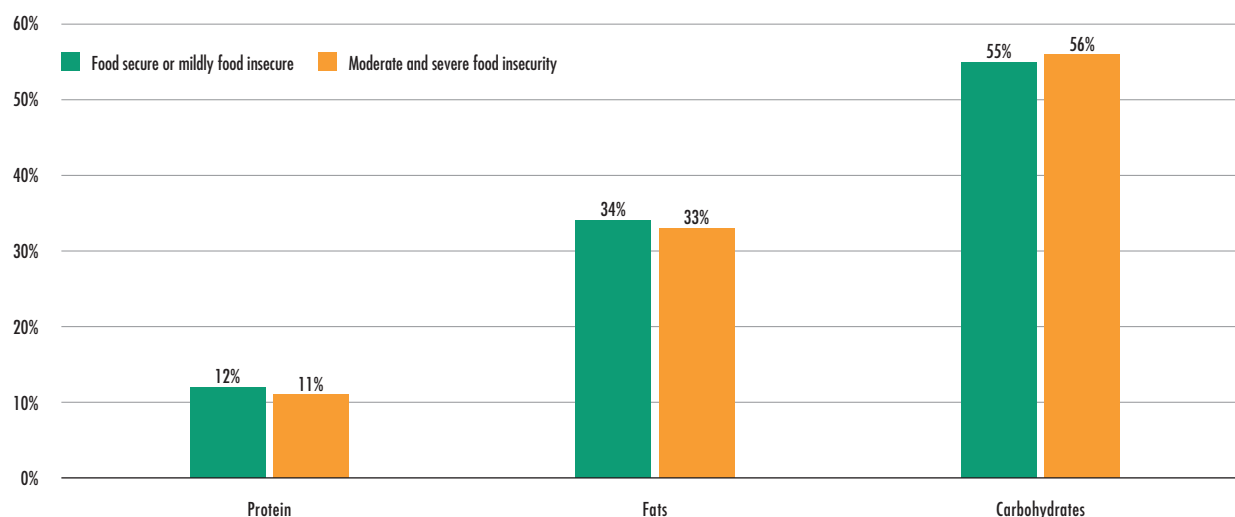
There are not many differences between the contributions of macronutrients to the total dietary energy consumed by food insecure compared to food secure households. For both population groups, the diet is rich in fats and low in carbohydrates (Figure 35). The contribution of proteins to the total

energy consumed is slightly lower for food insecure people, with a lower contribution from animal protein to total proteins consumed (45 percent of the protein consumed by food insecure households comes from animal sources, while this share is 47 percent for food secure households).

FIGURE 35

Macronutrient consumption

Contribution of macronutrients to the average dietary energy consumed by expenditure quintile (%)

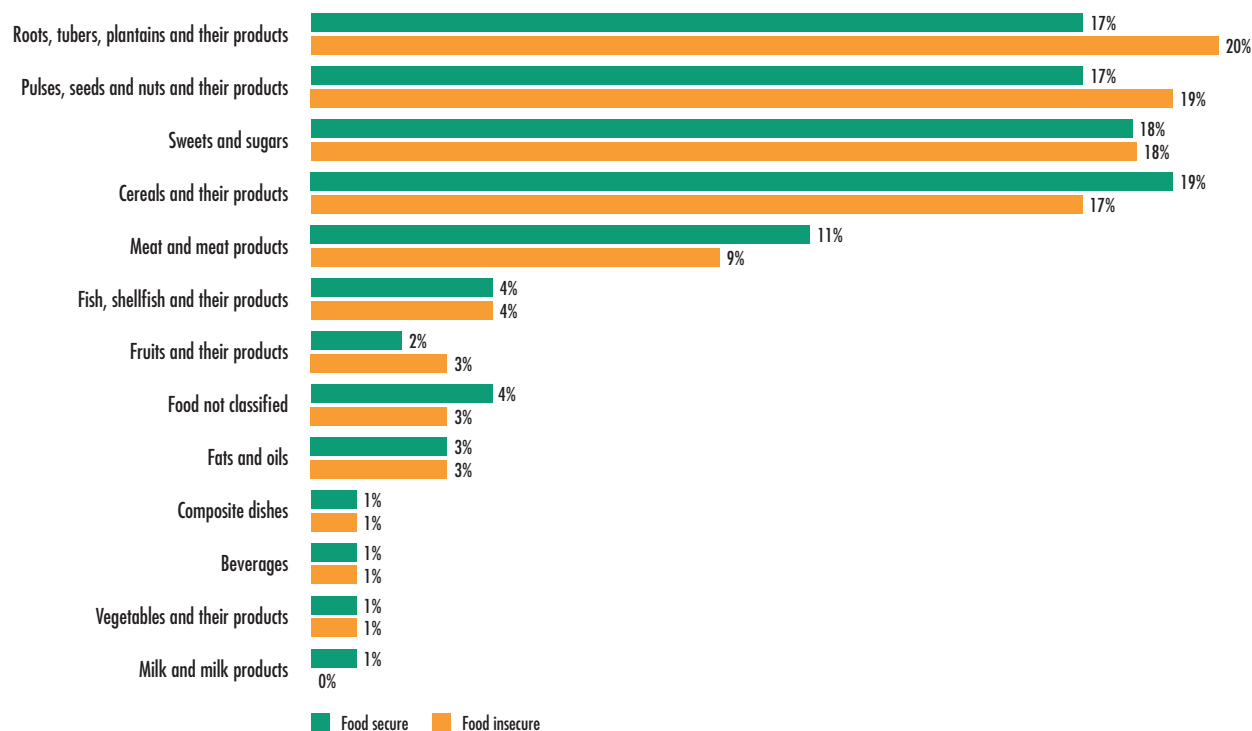


SOURCE: Food data collected in 2018 HIES of Samoa

FIGURE 36

Contribution of food groups to the diet of food secure and food insecure

Contribution of food groups to the total dietary energy consumed (%)



SOURCE: Food data collected in 2018 HIES of Samoa

The contribution of “roots, tubers and plantains” and “pulses, seeds and nuts” to the total amount of energy consumed is higher for food insecure households than for food secure households, for which the contribution of cereals and meat is much higher. There is not much difference in contribution of “sweets and sugar”, “fish”, “beverages” to the

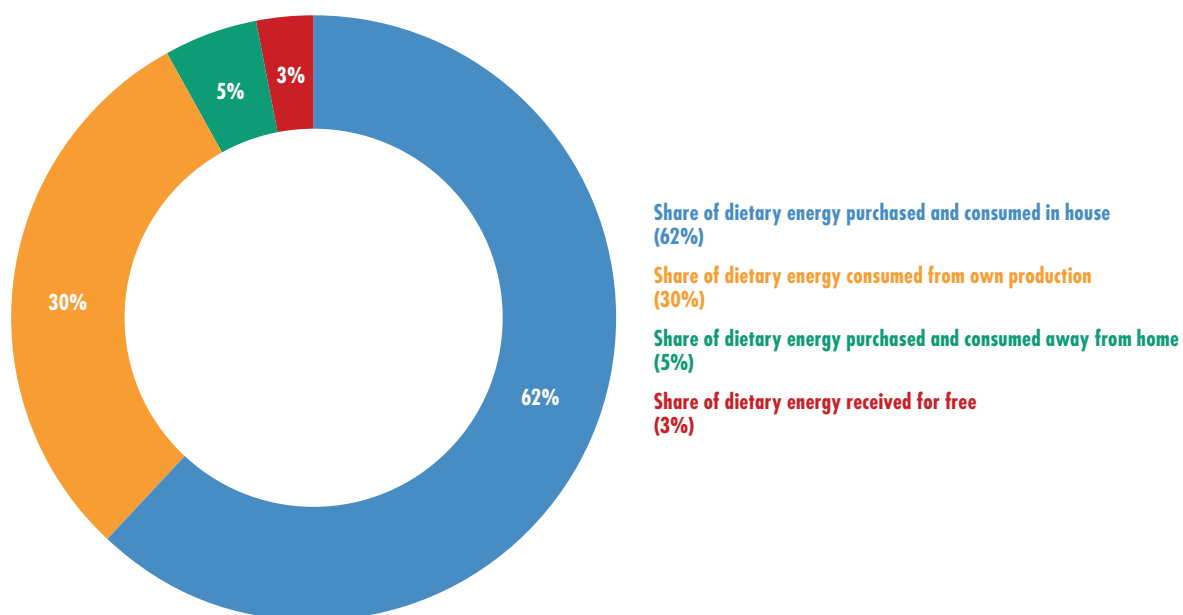
diet of both food secure and insecure households but the contribution of fruits is slightly higher for food insecure households (Figure 36).

About 40 percent of the dietary energy consumed by food insecure households comes from own production and 55 percent is purchased (Figure 37).

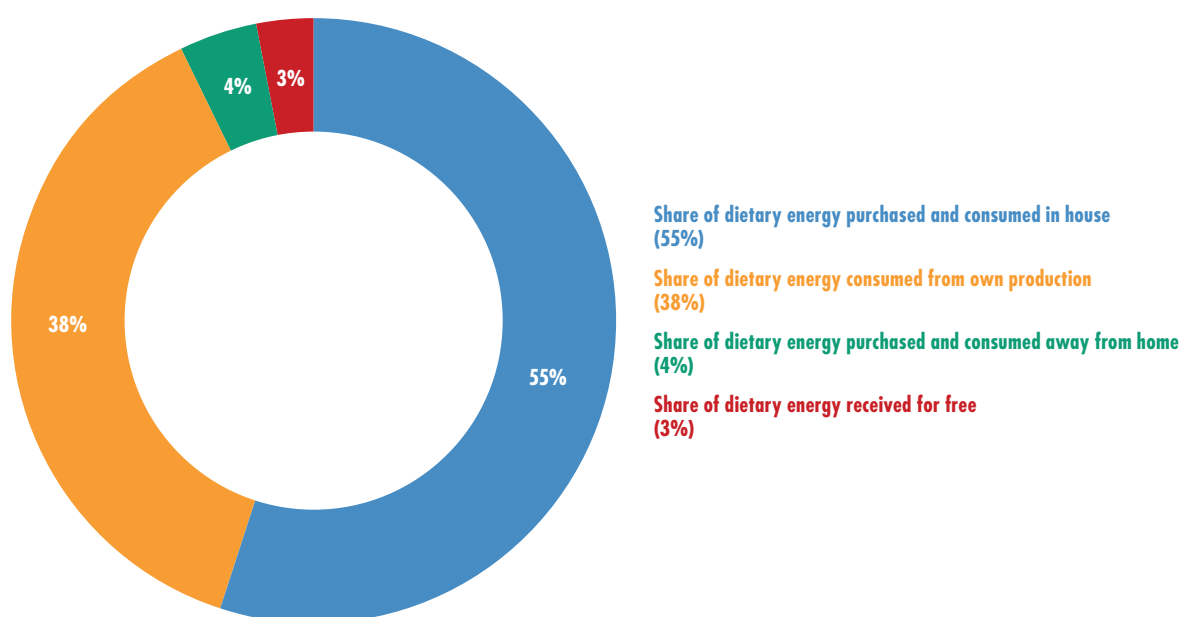
FIGURE 37

Contribution of sources of acquisition to the total dietary energy consumed by food secure and moderate or severe food insecure

Food secure or mildly food insecure



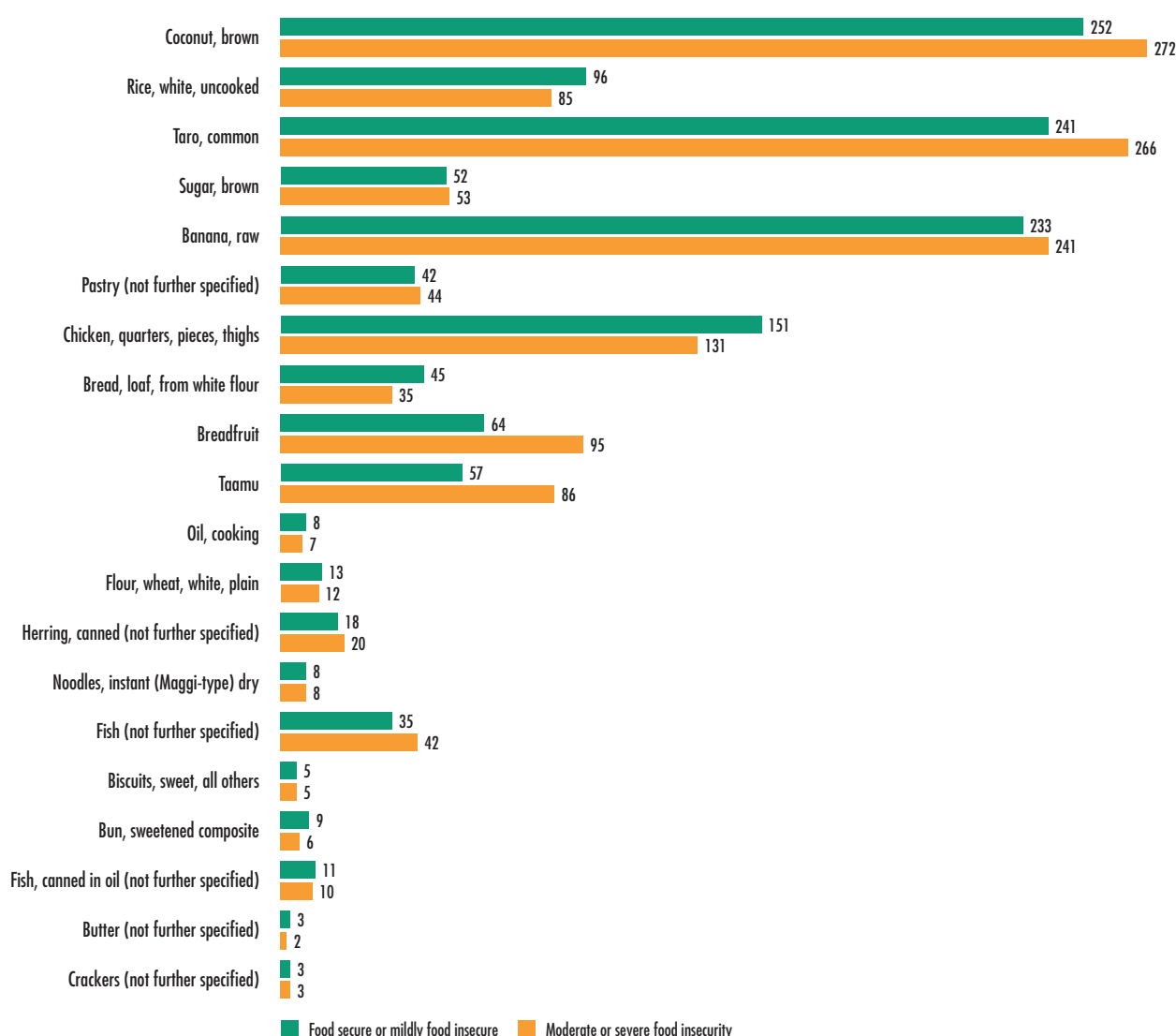
Moderate and severe food insecurity



SOURCE: Food data collected in 2018 HIES of Samoa

FIGURE 38
Average quantity consumed by food secure and food insecure

Average quantity (as purchased) by main food products contributing to 90% of the diet of food insecure (grams/capita/day)



SOURCE: Food data collected in 2018 HIES of Samoa

Compared to food secure households, food insecure households rely more on own production with more than 80 percent of the dietary energy consumed from “roots, pulses and plantain” and “fruits” being own produced compared to less than 70 percent for food secure households. Food insecure households still purchase more than one half of the dietary energy they consume from vegetables and 14 percent of dietary energy they consume from fish and shellfish is received as a gift, mainly in the form of canned fish (Table 10).

Out of the 504 food products reported as acquired at least once by a household over the last 14 days, food secure households reported 496 foods while food insecure households reported only 326. Twelve food products contribute to 80 percent of the dietary energy consumed, and 20 products to 90 percent compared to, respectively, 14 and 29 food products

contributing to 80 percent and 90 percent of the dietary energy consumed by food secure households. Coconut brown, taro, banana raw, chicken quarters, breadfruit, taamu, rice and sugar are the foods that contribute the most to the dietary energy consumed by food insecure households (Figure 38). Compared to food secure households, food insecure households consume more roots and starchy foods and less chicken and rice. Food insecure people consume a quantity of fish slightly higher than that consumed by food secure people but this fish may be of a lower quality, as to get 1 000 kcal in fish food, insecure households spend 76 cents less than food secure households (Table 11).

Apart from vitamin C, adequacy (expressed in terms of ratio of vitamin available for consumption over requirements) of the essential vitamins is lower for food insecure households compared to food secure

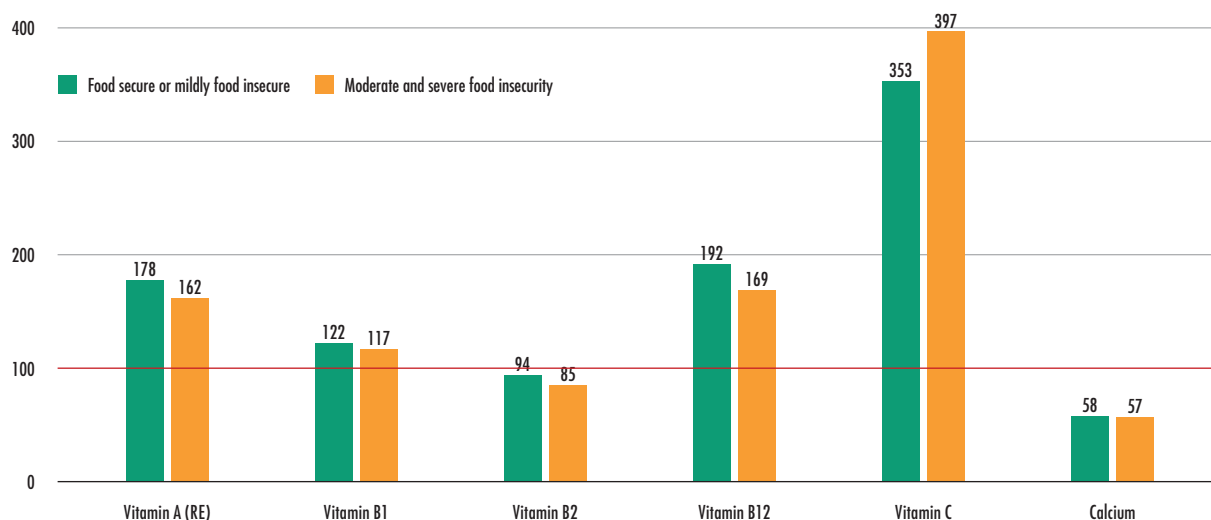
households. Food insecure households do not reach adequacy for vitamin B2 and the apparent quantity consumed of vitamin A is slightly lower than the requirement. Conversely, the apparent consumption of vitamin C is much higher for food insecure

households than for food secure households (Figure 39), and this may be due to their higher consumption of breadfruits and taamu. Adequacy in calcium is not reached by either food secure or food insecure households, reflecting the national trend.

FIGURE 39

Ratio of average consumption over requirements of essential vitamins and calcium

Ratio of average consumption over requirements of essential micronutrients and calcium (%)



SOURCE: Food data collected in 2018 HIES of Samoa



TABLE 8

Contribution of sources of acquisition to the total dietary energy consumed by food secure and food insecure households by food groups

	Contribution of purchases to total dietary energy consumed	Contribution of own production to total dietary energy consumed	Contribution of gifts to total dietary energy consumed	Contribution of dietary energy from food group to total dietary energy consumed
Food secure or mildly food insecure households				
Roots, tubers, plantains and their products	25.5	70.9	3.6	18%
Pulses, seeds and nuts and their products	28.7	69.9	1.4	18%
Sweets and sugars	98.0	0.1	1.9	19%
Cereals and their products	97.1	0.1	2.8	19%
Meat and meat products	86.3	4.9	8.9	11%
Fish, shellfish and their products	76.7	10.5	12.9	4%
Fruits and their products	27.9	69.3	2.8	3%
Fats and oils	99.1	0.0	0.9	4%
Composite dishes	75.8	14.0	10.2	1%
Beverages	93.8	5.3	0.9	1%
Vegetables and their products	67.5	30.2	2.3	1%
Milk and milk products	98.9	0.0	1.0	1%
Spices and condiments	99.1	0.0	0.9	0%
Savoury snacks	98.6	0.0	1.4	0%
Eggs and their products	97.7	0.2	2.1	0%
Moderate or severe food insecure households				
Roots, tubers, plantains and their products	17.8	80.1	2.1	20%
Pulses, seeds and nuts and their products	17.1	82.2	0.7	19%
Sweets and sugars	98.4	0.1	1.5	18%
Cereals and their products	96.7	0.3	3.0	17%
Meat and meat products	86.6	5.4	8.0	9%
Fish, shellfish and their products	73.0	12.7	14.3	4%
Fruits and their products	12.8	84.6	2.6	3%
Fats and oils	98.4	0.3	1.3	3%
Composite dishes	68.1	21.3	10.6	1%
Beverages	94.9	4.5	0.5	1%
Vegetables and their products	58.9	39.2	1.9	1%
Milk and milk products	98.8	0.6	0.6	0%
Spices and condiments	99.3	0.4	0.3	0%
Savoury snacks	98.7	0.3	1.0	0%
Eggs and their products	98.4	0.0	1.6	0%

SOURCE: Food data collected in 2018 HIES of Samoa

TABLE 9

Distribution of average quantity consumed and unit cost of 1 000 kcal by products contributing to 90 percent of the dietary energy consumed by moderately or severely food insecure households

	Average quantity as purchased (g/capita/day)	Average edible quantity (g/capita/day)	Median dietary energy unit value (LCU/1 000 kcal)	Contribution to the dietary energy consumed (%)
Food secure or mildly food insecure households				
Coconut, brown	251.9	120.9	0.26	17%
Rice, white, uncooked	96.1	96.1	0.93	11%
Taro, common	241.3	217.2	2.33	8%
Sugar, brown	51.6	51.6	0.83	7%
Banana, raw	233.3	151.7	1.24	7%
Pastry (not further specified)	42.3	42.3	0.08	7%
Chicken, quarters, pieces, thighs	150.8	98.0	2.96	8%
Bread, loaf, from white flour	44.8	44.8	1.36	4%
Breadfruit	63.7	49.7	1.41	2%
Taamu	56.8	47.7	1.93	2%
Oil, cooking	8.1	8.1	0.79	3%
Flour, wheat, white, plain	13.4	13.4	0.88	2%
Herring, canned (not further specified)	17.5	13.8	3.58	1%
Noodles, instant (Maggi-type) dry	8.0	8.0	2.18	1%
Fish (not further specified)	34.6	22.9	6.39	1%
Biscuits, sweet, all others	4.8	4.8	1.19	1%
Bun, sweetened composite	9.2	9.2	0.89	1%
Fish, canned in oil (not further specified)	10.7	8.1	4.48	1%
Butter (not further specified)	2.9	2.9	4.12	1%
Crackers (not further specified)	2.6	2.6	1.33	0%
Moderate or severe food insecure households				
Coconut, brown	272.0	130.6	0.27	19%
Rice, white, uncooked	84.5	84.5	0.96	10%
Taro, common	265.8	239.2	2.34	10%
Sugar, brown	52.6	52.6	0.84	7%
Banana, raw	241.0	156.6	1.24	7%
Pastry (not further specified)	44.4	44.4	0.07	7%
Chicken, quarters, pieces, thighs	130.7	84.9	3.06	7%
Bread, loaf, from white flour	35.0	35.0	1.36	3%
Breadfruit	94.6	73.8	1.28	3%
Taamu	86.3	72.5	1.91	3%
Oil, cooking	6.5	6.5	0.79	2%
Flour, wheat, white, plain	11.7	11.7	0.87	2%
Herring, canned (not further specified)	19.5	15.4	3.51	1%
Noodles, instant (Maggi-type) dry	8.2	8.2	2.14	1%
Fish (not further specified)	42.2	27.9	5.63	1%
Biscuits, sweet, all others	5.0	5.0	0.93	1%
Bun, sweetened composite	5.9	5.9	0.89	1%
Fish, canned in oil (not further specified)	10.3	7.8	4.43	1%
Butter (not further specified)	2.0	2.0	4.10	1%
Crackers (not further specified)	3.3	3.3	1.01	1%

SOURCE: Food data collected in 2018 HIES of Samoa



CHAPTER 8

SUMMARY OF THE MAIN FINDINGS

The analysis of the food consumption data collected in the 2018 Household Income and Expenditure Survey (HIES) conducted in Samoa, shows that a Samoan consumes, on average, 2 840 kcal per day. With this daily amount of dietary energy, accessing food or energy in enough quantity to meet the daily requirements to have a healthy life and maintain a certain level of physical activity, is not an issue for the Samoan population.

Statistics show that less than one person in twenty is undernourished in Samoa, as measured by the prevalence of undernourishment or SDG indicator 2.1.1. However, the analysis of the Food Insecurity Experience Scale (FIES), included for the first time in a large-scale survey conducted in Samoa and used to estimate the SDG indicator 2.1.2, shows that accessing safe and nutritious food seems to be a major concern for people in Samoa, as more than one person in four is struggling to access different foods to allow for a more diversified and healthy diet.

Some disparities can be observed in the distribution of dietary energy, as poorer households (i.e. the lowest 20 percent of the total expenditure distribution) access an amount of dietary energy half that of richer households (i.e. the top 20 percent of the total expenditure distribution). The larger the household size, the lower the amount of dietary energy accessed on average by its members. Similarly, for households in which the head is younger than 40 years old compared to those in which the head is older, a lower amount of dietary energy is accessed, on average, by household members.

Eleven food groups compose the average diet of a Samoan and only 13 food products contribute to 80 percent of the total dietary energy consumed. Coconut brown, rice, taro and chicken quarters contribute alone to, respectively, 18 percent, 11 percent, 9 percent and 8 percent of the total energy consumed. Households acquire on average 247 grams of taro, followed by 235 grams of banana raw, 257 grams of coconut brown and 100 grams of rice and chicken per capita per day. Chicken, sugar, rice and bread are also the products that have been acquired at least once over the 14-days diary period by more than 80 percent of the households.

On average a Samoan spends WST 5.4 to acquire food which corresponds to 45 percent of the total household expenditure and 62 percent of the dietary energy consumed comes from purchases while 30 percent comes from own production. Poor households strongly rely on self-subsistence, as about 40 percent of the dietary energy they consume comes from their own production. More than 90 percent of the calories comes from sweets and sugar, cereals, meat and fish are purchased while three fourths of the calories comes from tubers and plantains, and nuts and fruits are own produced.

Other than butter and biscuits, all the food products that contribute to 90 percent of the dietary energy consumed, costs less than WST 1 per 100 grams. With less than 20 cents per 100 grams, pastries of all kind, sweets and sugar, coconut brown, banana raw and breadfruit are the least expensive. It costs 30 cents to get 100 grams of sugar brown, 40 cents to get 100 grams of chicken quarters and 79 cents to get oil, which is one of the most energy-dense foods. Cereals such as rice or flour or other energy-dense foods such as oils and sugar are very cheap sources of energy, as it costs less than WST 1 to get 1 000 kcal from these products while it would cost more than WST 5 to get the same number of calories from fish or milk and other dairy products.

The variety of foods that households can access is uneven throughout Samoa. In Apia, 20 food products contribute to 80 percent of the dietary energy consumed while this number falls to 10 in Savai'i. Coconut, taro, pastry of all kinds, and rice bring alone contribute half of the calories consumed in Savai'i compared to rice, chicken, coconut, pastry, sugar and bread in Apia.



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In terms of essential nutrients, the diet is rich in fats that contribute to 34 percent, on average, to the total amount of energy consumed at the national level, which is very close to the upper limit of the WHO recommended norm for a balanced diet. Proteins contribute to 11 percent and carbohydrates 55 percent to the energy consumed, which is close to the lower limit of WHO recommended norm. Apart from vitamin B2, adequacy as measured by the ratio of apparent consumption over average requirements is reached for vitamin A, vitamin B1, vitamin B12 and vitamin C. The apparent consumption of calcium is half the requirement.

The analysis of the FIES reveals that 27 percent of the people in Samoa (slightly more than 53 000 people) is food insecure. But magnitude and severity of food insecurity is not homogenous throughout the

population, as more than one third of the households are food insecure in Savai'i compared to 17 percent in Apia.

Food insecure households are usually composed of more members than food secure and are poorer (as proxied by total expenditure). They consume on average a slightly lower amount of dietary energy that is still on average high enough not to experience hunger except for 2.3 percent of households. Coconut brown, taro, banana raw, chicken quarters, breadfruit, taamu, rice and sugar are the foods that contribute the most to the dietary energy consumed by those food insecure. Compared to food secure households, food insecure households rely more on own production with more than 80 percent of the dietary energy consumed from roots, pulses and fruits being own produced.

Conclusion

The analysis of the data collected in the 2018 HIES in Samoa, shows that more than one Samoan in four does not have access to enough nutritious foods. Indeed, the analysis reveals a diet rich in fats at the limit of recommend fat intake for a balanced and healthy diet. The direct consequences of such an unhealthy diet can be seen in the high percentage of adult obesity and/or diabetes that have increased to more than 45 percent as consumer preferences have switched from traditional diets to calorie-rich and nutrient-poor imported foods.

This trend has been observed in many Pacific countries, and in 2018, SPC together with experts in nutrition developed guidelines for healthy living in the Pacific in the form of a handbook for educators and health professionals.⁴⁸ These guidelines categorize foods into three kinds: energy foods, protective foods and body building foods, and provide recommendations on the amount of foods belonging to each category that should be eaten. In addition, each category is broken down into foods to select, foods to limit and foods to avoid.

Following these guidelines, an attempt was made to categorize the foods consumed in Samoa into foods to select, foods to limit and foods to avoid. Following these classifications, it was found that almost 40 percent of the dietary energy consumed in Samoa is composed of foods to limit or foods to avoid. Therefore, it is important that more work be done to educate populations in Samoa on the benefits of healthy foods and to raise awareness of which are the healthy foods to eat, supporting this by developing policies to ensure populations can access these foods.

Finally, this analysis was performed using food data collected in a survey that was not designed to conduct an in-depth analysis on food and nutrient consumption. Therefore, it is recommended to consider these results as reflecting a pattern rather than facts, as it is only through a comprehensive 24-hour recall individual intake survey and anthropometric survey that it will be possible to assess the nutritional status of Samoans in a more accurate and proper way to further develop adequate food consumption and nutrition policies.

⁴⁸ Pacific guidelines for healthy living – a handbook for health professionals and educators. SPC. 2018. <https://www.spc.int/updates/blog/2018/07/pacific-guidelines-for-healthy-living>.



ANNEX 1

Methodology

Annex 1.1

SDG 2.1.1: The prevalence of undernourishment

Based on the food consumption data collected in the 2018 Household Income and Expenditure Survey conducted in Samoa **less than 1 person in 20 is undernourished in Samoa** (SDG 2.1.1 ranges between 2.5 percent and 5 percent). More than 5 000 people but a number fewer than 10 000 people in Samoa are experiencing hunger.

Definition: Undernourishment is defined as the condition of an individual whose habitual food consumption is insufficient to provide, on average, the amount of dietary energy required to maintain a normal, active, healthy life.

How it is reported: The SDG 2.1.1 indicator is reported as a prevalence and is denominated as “prevalence of undernourishment” (PoU), which is an estimate of the percentage of individuals in the total population who are in a condition of undernourishment.

Methodology: To compute an estimate of the prevalence of undernourishment in a population, the probability distribution of habitual dietary energy intake levels (expressed in kcal per person per day) for the average individual is modelled as a parametric probability density function (pdf), $f(x)$. The indicator is obtained as the cumulative probability that the habitual dietary energy intake (x) is below the minimum dietary energy requirements (MDER) (i.e. the lowest limit of the range of energy requirements for the population’s representative average individual) as in the formula below:

$$\text{PoU} = \int x < \text{MDER} f(x|\theta) dx$$

where θ is a vector of parameters that characterizes the pdf. The distribution is assumed to be lognormal, and thus fully characterized by only two parameters: the mean dietary energy consumption (DEC), and its coefficient of variation (CV).

Data sources: Main sources used to estimate the parameters in the 2018 HIES of Samoa

- Minimum dietary energy requirement (MDER): Human energy requirements for an individual in a given sex/age class are determined on the basis of normative requirements for basic metabolic rate (BMR) per kilogram of body mass, multiplied by the ideal weights that a healthy person of that class may have, given his or her height, and then multiplied by a coefficient of physical activity level (PAL) to take into account physical activity. Given that both healthy BMIs and PALs vary among active and healthy individuals of the same sex and age, a *range* of energy requirements applies to each sex and age group of the population. The MDER for the average individual in the population, that is the threshold used in the PoU formula, is obtained as the weighted average of the lower bounds of the energy requirement ranges for each sex and age group, using the shares of the population in each sex and age group as weights. Information on the population structure by sex and age is extracted from the demographic information on age and gender collected in the 2018 HIES of Samoa while information on height was taken from the 2015 HIES of Tonga.

- Dietary energy consumption (DEC) and coefficient of variation (CV) were extracted from the food data collected in the 2018 HIES. Quantities of food purchased or consumed from own production or received for free were reported by households in a diary and filled over a period of 14 days. These quantities were converted into grams using conversion factors provided by SBS and further converted into nutrient values using the Pacific Nutrient Database developed jointly by SPC, FAO and Wollongong University and based on the Food Composition Table of the PIC. The average DEC and the CV that describe the distribution of average daily dietary energy consumption in the population can be estimated. However, because of excess variability⁴⁹ observed in the distribution of daily energy, additional data treatment⁵⁰ was needed to get a reliable estimate of the CV.

SDG 2.1.1	MDER (kcal/capita/day)	DEC (kcal/capita/day)	CV (%)
Less than 5%	1 818	2 840	26

Challenges and limitations: While formally the state of being undernourished or not is a condition that applies to individuals, given the data usually available on a large scale, it is impossible to reliably identify which individuals in a certain group are actually undernourished. Through the statistical model described above, the indicator can only be computed with reference to a population or a group of individuals for which a representative sample is available.

Because of the under estimation of dietary energy in urban areas due to under reporting of food consumed away from home in the 2018 HIES, the prevalence of undernourishment for Samoa *cannot be further disaggregated*.

Due to the probabilistic nature of the inference and the margins of uncertainty associated with estimates of each of the parameters in the model, the precision of the PoU estimates is generally low. While it is not possible to formally compute margins of error around PoU estimates, these are expected to likely exceed 5 percent in most cases. For this reason, in case of Samoa we report a prevalence of undernourishment higher than 2.5 percent and lower than 5 percent.

References

- FAO. 1996. *The Sixth World Food Survey*, pp. 114–143. Rome.
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⁴⁹ Excess variability is due to survey design (the 2018 HIES of Samoa was not designed to measure individual food consumption), field work, data entry or other measurement errors.

⁵⁰ The Coefficient of Variation that measures inequality in accessing dietary energy is estimated as the sum of inequality in accessing energy due to socio economic differences (CV of income) and inequality in accessing energy due to differences in energy requirements (CV of requirements). See <http://www.fao.org/3/a-i4046e.pdf> for more details about the estimation of the CV and treatment for excess variability. In case of Samoa we used income distribution as welfare indicator to measure inequality in access to food.

ANNEX 1.2

SDG 2.1.1 – The prevalence of moderate or severe food insecurity based on the FIES

Preliminary estimates find that about **one person out of 40 (or about 5 090 people) in Samoa were exposed to severe levels of food insecurity** in 2018, implying reductions in the quantity of food consumed to the extent that they have possibly experienced hunger.⁵¹

A broader look at the extent of food insecurity beyond severe levels and hunger reveals that an additional **48 000 people have experienced food insecurity at moderate levels**. This implies that these additional people did not have regular access to sufficient nutritious foods, even if they were not necessarily suffering from hunger, therefore putting them at greater risk of various forms of malnutrition and poor health than the food secure population.

Definition: Food insecurity as measured by this indicator refers to limited *access to food*, at the level of individuals or households, due to lack of money or other resources. The severity of food insecurity is measured using data collected with the *Food Insecurity Experience Scale survey module* (FIES-SM), a set of eight questions asking individual or households to self-report conditions and experiences typically associated with limited access to food.

Q1: Were you worried that you would run out of food because of a lack of money or other resources?

Q2: Were you unable to eat healthy and nutritious food because of a lack of money or other resources?

Q3: Did you eat only a few kinds of food because of a lack of money or other resources?

Q4: Did you have to skip a meal because there was not enough money or other resources to get food?

Q5: Did you eat less than you thought you should because of a lack of money or other resources?

Q6: Did your household run out of food because of a lack of money or other resources?

Q7: Were you hungry but did not eat because there was not enough money or other resources?

Q8: Did you go without eating for a whole day because of a lack of money or other resources?

This indicator is particularly relevant for countries where severe food deprivation may no longer be of concern, but where sizeable pockets of food insecurity still remain. In this sense, it is an indicator that is fully aligned with the universality principles of the 2030 Agenda.

How it is reported: The estimates correspond to the prevalence (percent) of individuals in the population living in households where *at least one adult was found to be food insecure*.⁵²

Data source: The eight questions of the FIES-FM were introduced for the first time in Samoa through the 2018 Household Income and Expenditure Survey.

Methodology: The data were validated and used to construct a scale of food-insecurity severity using the Rasch model, which postulates that the probability of observing an affirmative answer by respondent *i* to question *j* is a logistic function of the distance, on an underlying scale of severity,

⁵¹ This estimate is on line with the SDG 2.1.1 estimate for Samoa discussed earlier.

⁵² In the 2018 HIES the module was aiming at collecting information for each individual older than 15 years living in the household. However, in many cases where individuals were missing, the respondent answered on behalf of missing individuals. To remove the bias only one respondent was selected per household. Final estimate was weighted using population weight.

between the position of the respondent, a_i , and that of the item, b_j .

$$\text{Prob}(X_i, j = \text{Yes}) = \exp(a_i - b_j) / (1 + \exp(a_i - b_j))$$

By applying the Rasch model to the FIES data, it is possible to estimate the probability of being food insecure (p_i, L) at each level of severity of food insecurity L (moderate or severe, or severe), for each respondent i , with $0 < p_i, L < 1$.

The prevalence of food insecurity at each level of severity (**FIL**) in the population is computed as the weighted sum of the probability of being severely food insecure for all respondents (i) in a sample:

$$\text{FIL} = \sum p_i, L w_i$$

where w_i are post-stratification weights that indicate the proportion of individuals or households in the national population represented by each record in the sample.

Challenges: to produce comparable measures over time and across different populations, a common scale was established as a reference (exactly as converting measures of temperature across difference measuring scales – such as Celsius and Fahrenheit). The national scale of severity of food insecurity in Samoa was then equated to the global standard to obtain a SDG 2.1.2 estimate that can be further compared to global, regional or country level of severe food insecurity based on the FIES. The Food Insecurity Experience Scale was introduced for the first time in 2018 in the Household Income and Expenditure Survey by Samoa Bureau of Statistics, and the scale was not tested before its inclusion. Despite this, the scale performed relatively well. However, it was found that the question related to healthy food (“*Were you unable to eat healthy and nutritious food because of a lack of money or other resources?*”), seems not to have been well interpreted by respondents, as the concept of healthy food might be specific to the local context. The analysis was therefore performed excluding this question. Further work might be needed in the future to improve the scale and adapt it to better reflect the national setting.

References

- FAO. 2016. *Methods for estimating comparable rates of food insecurity experienced by adults throughout the world*. Rome.
- FAO. 2018. *Voices of the hungry*. Rome. www.fao.org/in-action/voices-of-the-hungry

ANNEX 2

ADePT-Food Security Module (FSM) output tables

ANNEX 2.1

Main food consumption indicators by population groups

	Number of sampled households	Number of represented households ('000s)	Average household size	Average dietary energy consumption (kcal/capita/day)	Average dietary energy consumption per adult equivalent	Minimum dietary energy requirement (kcal/capita/day)	Average food consumption in monetary value (LCU/capita/day)	Average dietary energy unit value (LCU/1 000 kcals)	Average total consumption in monetary value (LCU/capita/day)	Household dietary diversity score (HCES-DDS)	Dietary energy from food items included in the HCES-DDS (Kcal/capita/day)
Total	2 997	29.0	6.9	2 838	3 904	1 859	5.41	2.20	15.25	11	2 724
Quintiles of income											
Lowest quintile	619	5.8	9.7	1 830	2 656	1 798	2.76	1.67	5.13	10	1 774
Second	604	5.8	7.9	2 601	3 658	1 847	4.26	1.82	8.78	11	2 495
Middle	605	5.8	7.0	3 180	4 406	1 862	5.74	2.01	12.55	11	3 064
Forth	594	5.8	5.7	3 609	4 797	1 910	7.43	2.32	19.64	11	3 475
Highest quintile	575	5.8	4.0	4 054	5 266	1 949	10.70	3.19	51.16	11	3 816
Terciles of HCES-DDS											
Lowest	776	7.6	5.6	1 927	2 625	1 871	3.77	2.43	14.97	8	1 808
Mid	1 157	11.1	7.1	2 713	3 717	1 859	4.93	2.06	13.00	11	2 608
Highest	1 064	10.3	7.6	3 468	4 799	1 851	6.82	2.19	17.67	12	3 347
Area of residence											
Urban	582	5.7	6.5	2 362	3 196	1 882	5.65	2.83	20.96	11	2 230
Rural	2 415	23.3	7.0	2 947	4 066	1 853	5.36	2.05	13.93	11	2 837
Categories for the size of the household											
1 to 4 people	836	8.2	2.9	3 826	4 898	1 963	8.61	2.67	32.31	10	3 690
5 to 6 people	743	7.2	5.5	3 284	4 460	1 893	6.61	2.18	19.56	11	3 134
7 to 9 people	823	7.9	7.8	2 899	4 050	1 845	5.26	1.97	13.07	11	2 785
More than 10 people	595	5.8	12.8	2 227	3 160	1 818	3.86	1.88	9.24	11	2 139
Gender of the head of the household											
Male	2 368	22.9	6.9	2 845	3 903	1 862	5.44	2.20	15.54	11	2 727
Female	629	6.1	6.9	2 810	3 904	1 847	5.32	2.20	14.15	11	2 711
Class of age for the head of the household											
Age 18 to 39	381	3.7	5.7	2 780	4 189	1 761	5.80	2.36	15.10	10	2 662
Age 40 to 49	658	6.4	6.4	2 860	3 867	1 889	5.53	2.18	15.50	11	2 711
Age 50 to 59	823	8.0	6.9	2 871	3 801	1 911	5.33	2.17	15.58	11	2 761
Age 60 and above	1 135	10.9	7.5	2 820	3 917	1 833	5.31	2.18	14.93	11	2 721
Classes of severity of food security											
Food secure or mildly food insecure	2 266	22.2	6.7	2 866	3 931	1 863	5.60	2.28	16.82	11	2 742
Moderate and severe food insecurity	731	6.8	7.4	2 754	3 824	1 846	4.87	1.95	10.65	11	2 669
Region											
Apia	582	5.7	6.5	2 362	3 196	1 882	5.65	2.83	20.96	11	2 230
North West of Upolu	1 026	10.4	7.0	2 628	3 589	1 862	5.18	2.17	14.83	11	2 500
Rest of Upolu	661	6.6	7.1	3 228	4 452	1 854	5.61	2.01	14.07	11	3 111
Savi'i	728	6.3	6.8	3 180	4 451	1 838	5.39	1.89	12.29	11	3 107

SOURCE: Food data collected in 2018 HIES of Samoa

ANNEX 2.2**Contribution of each source of acquisition to the total dietary energy consumed**

	Number of sampled households	Number of represented households ('000s)	Proportion of purchased food as total food consumed (%)	Proportion of own produced food as total food consumed (%)	Proportion of food consumed away from home as total food (%)	Proportion of food consumed from other sources as total food (%)
Total	2 997	29.0	60.17	31.71	4.55	3.57
Quintiles of income						
Lowest quintile	619	5.8	57.07	37.12	3.32	2.49
Second	604	5.8	58.72	33.86	4.72	2.70
Middle	605	5.8	56.70	34.37	4.40	4.54
Forth	594	5.8	64.57	26.11	4.76	4.56
Highest quintile	575	5.8	70.28	17.69	7.20	4.83
Terciles of HCES-DDS						
Lowest	776	7.6	71.30	18.96	6.08	3.66
Mid	1 157	11.1	57.49	34.43	4.41	3.68
Highest	1 064	10.3	56.72	36.01	3.86	3.41
Area of residence						
Urban	582	5.7	81.76	9.48	5.74	3.01
Rural	2 415	23.3	55.20	36.82	4.28	3.70
Categories for the size of the household						
1 to 4 people	836	8.2	66.49	24.62	4.46	4.44
5 to 6 people	743	7.2	60.42	30.61	5.11	3.87
7 to 9 people	823	7.9	59.49	32.27	4.42	3.83
More than 10 people	595	5.8	58.56	34.12	4.40	2.91
Gender of the head of the household						
Male	2 368	22.9	59.47	32.28	4.65	3.61
Female	629	6.1	62.79	29.58	4.20	3.43
Class of age for the head of the household						
Age 18 to 39	381	3.7	63.35	28.05	5.00	3.59
Age 40 to 49	658	6.4	60.89	29.70	5.67	3.74
Age 50 to 59	823	8.0	59.09	33.29	4.34	3.28
Age 60 and above	1 135	10.9	59.71	32.60	4.02	3.67
Classes of severity of food security						
Food secure or mildly food insecure	2 266	22.2	61.77	29.71	4.82	3.69
Moderate and severe food insecurity	731	6.8	55.48	37.54	3.77	3.21
Region						
Apia	582	5.7	81.76	9.48	5.74	3.01
North West of Upolu	1 026	10.4	66.93	23.95	5.42	3.69
Rest of Upolu	661	6.6	45.85	46.43	4.01	3.70
Savai'i	728	6.3	45.61	48.03	2.65	3.70

SOURCE: Food data collected in 2018 HIES of Samoa

ANNEX 2.3

Contribution of each source of acquisition to the total food expenditures

	Number of sampled households	Number of represented households ('000s)	Proportion of food consumption in total income (%) (Engel ratio)	Proportion of purchased food as total food consumed (%)	Proportion of own produced food as total food consumed (%)	Proportion of food consumed away from home as total food (%)	Proportion of food consumed from other sources as total food (%)
Total	2 997	29.0	45.19	61.60	28.66	4.41	5.33
Quintiles of income							
Lowest quintile	619	5.8	54.11	59.48	33.30	3.34	3.88
Second	604	5.8	48.64	60.29	31.00	4.67	4.04
Middle	605	5.8	45.90	58.11	30.58	4.39	6.93
Forth	594	5.8	38.21	65.03	24.10	4.37	6.50
Highest quintile	575	5.8	25.35	70.52	15.94	6.62	6.93
Terciles of HCES-DDS							
Lowest	776	7.6	36.90	70.29	18.73	5.71	5.28
Mid	1 157	11.1	47.08	59.37	31.01	4.30	5.33
Highest	1 064	10.3	47.85	59.05	31.78	3.82	5.35
Area of residence							
Urban	582	5.7	36.16	81.01	9.17	5.56	4.26
Rural	2 415	23.3	47.26	57.13	33.14	4.15	5.57
Categories for the size of the household							
1 to 4 people	836	8.2	36.44	68.34	21.33	3.73	6.60
5 to 6 people	743	7.2	44.07	61.59	28.02	4.93	5.45
7 to 9 people	823	7.9	46.80	60.37	29.54	4.49	5.61
More than 10 people	595	5.8	47.26	60.46	30.63	4.29	4.61
Gender of the head of the household							
Male	2 368	22.9	44.98	60.90	29.20	4.52	5.38
Female	629	6.1	45.96	64.23	26.62	4.02	5.13
Class of age for the head of the household							
Age 18 to 39	381	3.7	44.96	63.40	26.88	4.36	5.36
Age 40 to 49	658	6.4	44.21	61.53	27.13	5.74	5.59
Age 50 to 59	823	8.0	45.17	61.14	29.68	4.22	4.96
Age 60 and above	1 135	10.9	45.75	61.48	29.20	3.89	5.43
Classes of severity of food security							
Food secure or mildly food insecure	2 266	22.2	43.44	63.27	26.60	4.68	5.45
Moderate and severe food insecurity	731	6.8	50.29	56.72	34.69	3.64	4.95
Region							
Apia	582	5.7	36.16	81.01	9.17	5.56	4.26
North West of Upolu	1 026	10.4	44.34	67.68	22.07	5.21	5.03
Rest of Upolu	661	6.6	48.43	50.50	39.88	3.93	5.70
Savai'i	728	6.3	50.89	46.61	44.44	2.61	6.34

SOURCE: Food data collected in 2018 HIES of Samoa

ANNEX 2.4**Contribution of macronutrients to the total dietary energy consumption**

	Number of sampled households	Number of represented households ('000s)	Average dietary energy consumption (kcal/capita/day)	Proportion of energy consumed as protein (%)	Proportion of energy consumed as fats (%)	Proportion of energy consumed as carbohydrates (%)
Total	2 997	29.0	2 838	11.41	33.51	55.08
Quintiles of income						
Lowest quintile	619	5.8	1 830	10.12	31.87	58.01
Second	604	5.8	2 601	11.09	34.01	54.91
Middle	605	5.8	3 180	10.99	34.10	54.90
Forth	594	5.8	3 609	12.40	34.00	53.60
Highest quintile	575	5.8	4 054	14.50	34.74	50.76
Terciles of HCES-DDS						
Lowest	776	7.6	1 927	12.57	29.17	58.26
Mid	1 157	11.1	2 713	11.10	33.44	55.46
Highest	1 064	10.3	3 468	11.09	35.98	52.94
Area of residence						
Urban	582	5.7	2 362	13.75	32.43	53.82
Rural	2 415	23.3	2 947	10.87	33.75	55.37
Categories for the size of the household						
1 to 4 people	836	8.2	3 826	12.66	32.72	54.62
5 to 6 people	743	7.2	3 284	11.86	32.52	55.62
7 to 9 people	823	7.9	2 899	11.10	33.16	55.74
More than 10 people	595	5.8	2 227	11.02	34.59	54.39
Gender of the head of the household						
Male	2 368	22.9	2 845	11.36	33.46	55.18
Female	629	6.1	2 810	11.59	33.68	54.73
Class of age for the head of the household						
Age 18 to 39	381	3.7	2 780	12.12	31.71	56.16
Age 40 to 49	658	6.4	2 860	11.19	32.68	56.13
Age 50 to 59	823	8.0	2 871	11.44	34.54	54.02
Age 60 and above	1 135	10.9	2 820	11.32	33.69	54.99
Classes of severity of food security						
Food secure or mildly food insecure	2 266	22.2	2 866	11.64	33.69	54.66
Moderate and severe food insecurity	731	6.8	2 754	10.73	32.97	56.31
Region						
Apia	582	5.7	2 362	13.75	32.43	53.82
North West of Upolu	1 026	10.4	2 628	11.74	29.91	58.35
Rest of Upolu	661	6.6	3 228	10.86	37.66	51.48
Savai'i	728	6.3	3 180	9.44	35.99	54.57

Range of population protein intake goal: 10%-15%

Range of population total fat intake goal: 15%-30%

Range of population total carbohydrates intake goal: 55%-75%

SOURCE: Food data collected in 2018 HIES of Samoa

ANNEX 2.5

Distribution of the dietary energy consumption by food groups⁵³

	Average edible quantity (g/capita/day)	Average food consumption in monetary value (LCU/capita/day)	Average dietary energy consumption (kcal/capita/day)	Average protein consumption (g/capita/day)	Average carbohydrates consumption (g/capita/day)	Average fat consumption (g/capita/day)
HDS Food not classified group						
Cereals	172.4	0.7	540	14.4	109.3	4.4
White roots and tubers	291.2	0.7	316	3.9	72.2	0.3
Vitamin A rich vegetables and tubers	17.8	0.1	7	0.4	1.1	0.1
Dark green leafy vegetables	8.1	0.0	3	0.4	0.1	0.1
Other vegetables	40.7	0.2	9	0.5	1.0	0.1
Vitamin A rich fruits	26.5	0.0	10	0.1	1.9	0.0
Other fruits	218.9	0.4	259	2.3	59.6	0.7
Organ meats	0.0	0.0	0	0.0	0.0	0.0
Flesh meats	147.9	1.3	308	25.8	1.3	22.1
Eggs	3.6	0.0	5	0.5	0.0	0.3
Fish and seafood	64.0	0.5	107	12.5	1.2	5.8
Legumes, nuts and seeds	123.8	0.1	502	5.0	4.4	49.5
Milk and milk products	24.2	0.1	19	1.0	1.4	1.1
Oils and fats	16.2	0.2	114	0.3	2.4	11.4
Sweets	144.6	0.5	507	5.6	93.2	12.1
Spices, condiments, beverages	27.3	0.3	18	0.7	1.5	0.6
Food not classified	N/A	0.2	114	3.6	14.5	4.4

N/A: Very low or no nutrient content or no consumption

Edible quantities: Food quantities adjusted by edible portions (e.g. eighty eight percent of an egg is edible). The edible quantities are not expressed in grams of primary commodities (e.g. the primary commodity of flour rice is grain rice); They correspond to the amount of edible quantity as consumed by households

Population intake goal of fruits and vegetables: At least 400 grams per person per day

SOURCE: Food data collected in 2018 HIES of Samoa

⁵³ See Annex 3 for the composition of the groups

ANNEX 2.6**Quantities of the main food products consumed and their respective groups**

	Food group	Average quantity as purchased (g/capita/day)	Average edible quantity (g/capita/day)	Contribution of the food product to the total energy consumed (%)
Bottled water/spring water	Beverages	10.24	10.24	0.0%
Cola flavour soft drink eg. Coca-Cola/Pepsi	Beverages	8.82	8.82	0.1%
Beer, lager	Beverages	4.48	4.48	0.1%
Soft drink (not further specified)	Beverages	3.90	3.90	0.0%
Cocoa, cocoa powder	Beverages	2.0	2.0	0.3%
Lemonade, soft drink, e.g. Sprite, 7 Up	Beverages	1.92	1.92	0.0%
Rice, white, uncooked	Cereals and their products	93.1	93.1	11.1%
Bread, loaf, from white flour	Cereals and their products	42.3	42.3	3.5%
Flour, wheat, white, plain	Cereals and their products	13.0	13.0	1.6%
Noodles, instant (Maggi-type) dry	Cereals and their products	8.1	8.1	1.3%
Vermicelli (lialia)	Cereals and their products	2.15	2.15	0.3%
Vaisalo, kokoesi, suafai etc	Cereals and their products	1.60	1.60	0.0%
Bun, Chinese steamed/keke puaa	Composite dishes	3.97	3.97	0.3%
Takeaway, barbecued, turkey tail, with or without fat	Composite dishes	4.73	2.60	0.2%
Soup, chicken	Composite dishes	2.50	2.50	0.1%
Takeaway, curry, chicken, with rice (pinati mixed)	Composite dishes	2.13	2.13	0.1%
Egg, chicken, fresh	Eggs and their products	3.81	3.31	0.1%
Oil, cooking	Fats and oils	7.7	7.7	2.4%
Butter (not further specified)	Fats and oils	2.7	2.7	0.7%
Fish (not further specified)	Fish, shellfish and their products	36.6	24.2	1.1%
Herring, canned (not further specified)	Fish, shellfish and their products	18.0	14.2	1.2%
Fish, canned in oil (not further specified)	Fish, shellfish and their products	10.6	8.0	0.6%
Fish, reef (not further specified)	Fish, shellfish and their products	8.27	5.91	0.2%
Fish, canned (not further specified)	Fish, shellfish and their products	5.74	4.44	0.3%
Breadfruit	Fruits and their products	71.5	55.8	2.1%
Papaya	Fruits and their products	36.30	25.41	0.3%
Pineapple	Fruits and their products	4.56	3.05	0.0%
Orange	Fruits and their products	2.78	2.14	0.0%
Chicken, quarters, pieces, thighs	Meat and meat products	145.6	94.7	7.4%
Turkey, wing	Meat and meat products	10.9	6.6	0.4%
Turkey, tail	Meat and meat products	10.13	5.27	0.3%
Sausage (not further specified) raw	Meat and meat products	5.1	5.1	0.4%
Pork (not further specified)	Meat and meat products	4.15	3.85	0.2%
Beef, canned, corned	Meat and meat products	3.74	3.74	0.3%
Turkey (not further specified)	Meat and meat products	3.95	3.17	0.2%
Beef, regular, cut not specified	Meat and meat products	3.10	3.05	0.2%
Lamb and mutton (not further specified)	Meat and meat products	2.29	2.01	0.1%
Milk, whole (full cream)	Milk and milk products	17.4	17.4	0.4%
Milk, long life, shelf stable (UHT), whole	Milk and milk products	5.70	5.70	0.1%
Coconut, brown	Pulses, seeds and nuts and products	257.0	123.4	17.6%

ANNEX 2.6

Quantities of the main food products consumed and their respective groups (continued)

	Food group	Average quantity as purchased (g/capita/day)	Average edible quantity (g/capita/day)	Contribution of the food product to the total energy consumed (%)
Taro, common	Roots, tubers, plantains and products	247.5	222.8	8.7%
Banana, raw	Roots, tubers, plantains and products	235.3	152.9	6.8%
Taamu	Roots, tubers, plantains and products	64.3	54.0	2.0%
Yam (not further specified)	Roots, tubers, plantains and products	5.22	4.49	0.1%
Potato (not further specified)	Roots, tubers, plantains and products	3.91	3.32	0.1%
Cassava, tapioca, manioc	Roots, tubers, plantains and products	2.65	2.49	0.1%
Salt, iodized	Spices and condiments	4.69	4.69	0.0%
Sauce, soy/shoyu	Spices and condiments	2.15	2.15	0.0%
Curry powder	Spices and condiments	2.04	2.04	0.2%
Sugar, brown	Sweets and sugars	51.8	51.8	7.1%
Pastry (not further specified)	Sweets and sugars	42.8	42.8	6.7%
Bun, sweetened composite	Sweets and sugars	8.4	8.4	0.8%
Biscuits, sweet, all others	Sweets and sugars	4.9	4.9	0.8%
Sweets, boiled, hard	Sweets and sugars	3.9	3.9	0.5%
Ice cream, cone or bar	Sweets and sugars	3.04	3.04	0.2%
Crackers (not further specified)	Sweets and sugars	2.8	2.8	0.4%
Ice blocks, flavoured ice, popsicles	Sweets and sugars	2.15	2.15	0.1%
Doughnut (not further specified)	Sweets and sugars	2.10	2.10	0.3%
Biscuits (not further specified)	Sweets and sugars	2.0	2.0	0.3%
Pie, sweet/fruit, all others	Sweets and sugars	1.80	1.80	0.2%
Pumpkin	Vegetables and their products	20.23	16.18	0.2%
Cucumber, unpeeled	Vegetables and their products	12.18	11.82	0.0%
Cabbage, Chinese	Vegetables and their products	10.22	9.40	0.1%
Onion, brown	Vegetables and their products	10.07	8.06	0.1%
Eggplant	Vegetables and their products	5.72	5.15	0.0%
Leaves, pele	Vegetables and their products	3.96	3.96	0.0%
Leaves, taro	Vegetables and their products	5.23	3.66	0.1%
Tomato, common	Vegetables and their products	2.11	2.08	0.0%
Carrot	Vegetables and their products	1.84	1.64	0.0%
Cabbage (not further specified)	Vegetables and their products	2.11	1.58	0.0%

SOURCE: Food data collected in 2018 HIES of Samoa

ANNEX 3

Composition of the FAO/GIFT grouping

Food group	Nutrition sub-groups
1 Cereals and their products excluding manufactured cereal based products	Rice and rice-based products Maize and maize-based products Fast Sorghum and sorghum-based products Millet and millet-based products Other cereals, mixed cereals or unspecified cereals and their products
2 Roots, tubers, plantains and their products excluding manufactured snacks such as chips	Potato, sweet potato and their products Cassava and similar roots (excluding taro) and their products Taro and taro-based products Yam and yam-based products Other and unspecified starchy roots and tubers (excluding sugary roots and tubers) and their products Plantain and plantain-based products
3 Pulses, seeds and nuts and their products including derived and manufactured products such as canned or jarred legumes, peanut butter, tahini paste, etc.	Pulses (excluding soybeans) and their products Soybean and soy-based products Nuts, seeds and their products
4 Milk and milk products	Milk: fresh and processed (excluding fermented milk products, cream, whey, cheese and other milk products) Fermented milk products Cream, whey and any other milk products excluding fermented milk products and cheese Cheese
5 Eggs and their products	Eggs: fresh and processed
6 Fish, shellfish and their products including processed fish and manufactured fish products	Freshwater fish (excluding offal): fresh and processed (excluding dried) Diadromous fish (excluding offal): fresh and processed (excluding dried) Marine fish (excluding offal): fresh and processed (excluding dried) Offal – fish and shellfish: fresh and processed (excluding dried) Shellfish (excluding offal) – all types: fresh and processed (excluding dried) Fish and shellfish – mixed or unspecified: fresh and processed (excluding dried) Fish and shellfish (including offal) – all types: dried
7 Meat and meat products including processed and manufactured meat products	Offal – all types: fresh and processed (excluding dried) Mammals, reptiles and amphibians (excluding offal): fresh and processed (excluding dried) Birds (excluding offal): fresh and processed (excluding dried) Meat – mixed or unspecified: fresh and processed (excluding dried) Meat – all types: dried
8 Insects, grubs and their products	Insects and grubs
9 Vegetables and their products	Leafy vegetables: fresh Yellow and orange vegetables: fresh Vegetables (excluding leafy vegetables and including fresh legumes): fresh Vegetables – all types: dried Vegetables – all types, mixed and unspecified: processed (excluding dried) Vegetables – mixed and unspecified: fresh
10 Fruits and their products	Yellow and orange fruits: fresh Fruits: fresh Fruits: dried Fruits: processed (excluding dried and candied)
11 Fats and oils	Vegetable fat and oil (excluding red palm oil) Red palm oil Animal fat and oil

Food group	Nutrition sub-groups
12 Sweets and sugars	Dough-based sweets Chocolate-based sweets Fruit and nut-based sweets Other sweets Sugars Dairy or dairy imitate based sweets
13 Spices and condiments	Herbs and spices Condiments
14 Beverages	Alcoholic drinks Drinking water Tea, herbal tea, coffee and cocoa Clear broths Soft drinks Fruit and vegetable drinks 100% fruit and vegetable juices
15 Foods for particular nutritional uses	Infant formulas and ready-to-eat meals for infants and young children Foods for weight reduction Foods for sporting people Foods for medical purposes
16 Food supplements and similar	Food supplements and similar
17 Food additives	Sweeteners and flavourings Colorants Other food additives Home-preparation aids Ingredients for food fortification/enrichment and supplements Microbiological or enzymatic ingredients
18 Composite dishes	Meat-based dishes Fish and seafood-based dishes Egg-based dishes Potato-based dishes Legume-based dishes Vegetable-based dishes Bread-based dishes and finger foods Pasta and noodle-based dishes Rice-based dishes Savoury pies and tarts Soups Salad-based dishes
19 Savoury snacks	Crisps and curls Other snacks

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