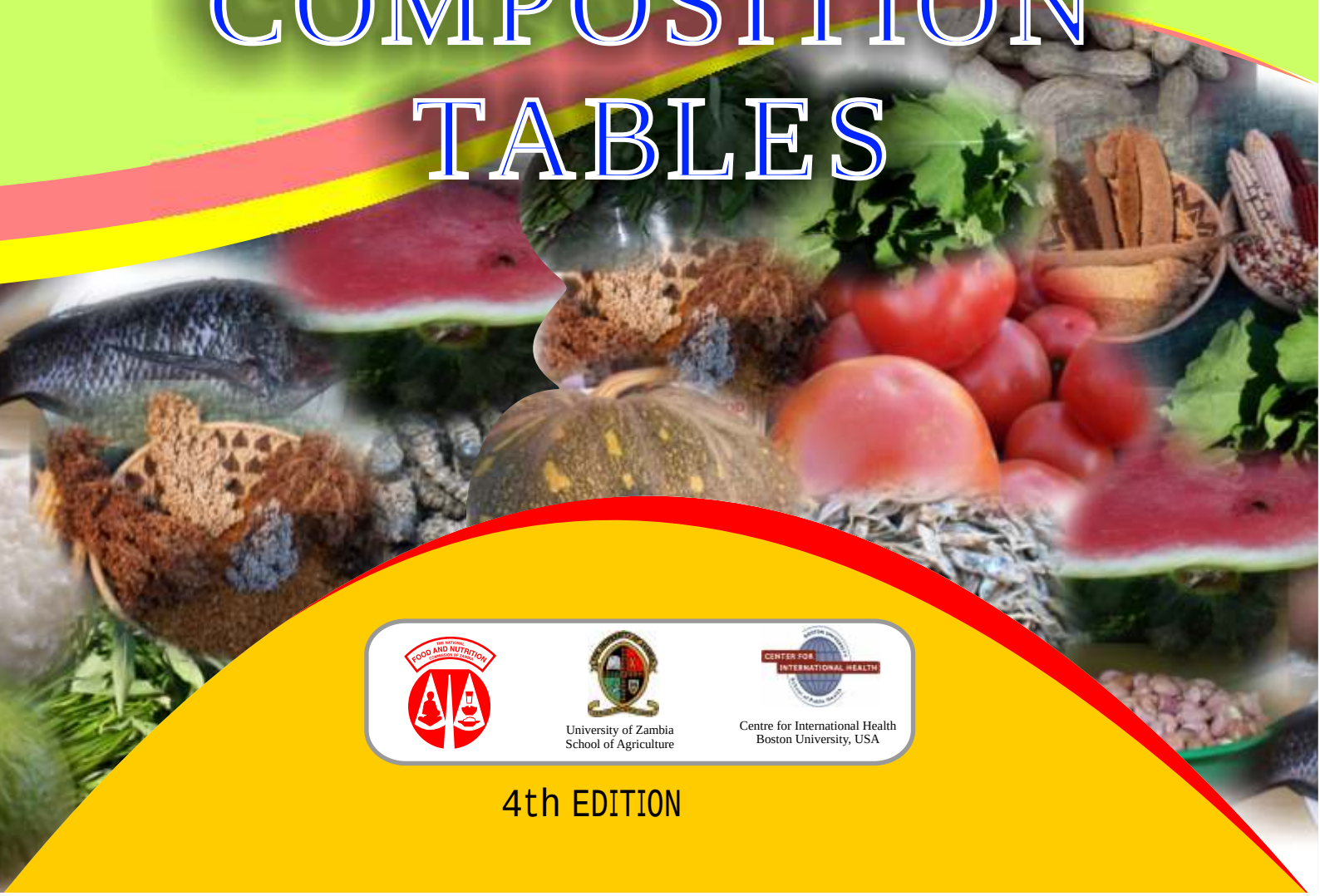
REPUBLIC OF ZAMBIA

ZAMBIA FOOD COMPOSITION TABLES



University of Zambia
School of Agriculture

Centre for International Health
Boston University, USA

4th EDITION

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For more copies and information contact:
National Food and Nutrition Commission (NFNC)
P.O. Box 32669
Lusaka, Zambia
Email: nfnc@zamtel.zm
www.nfnc.org.zm
Tel: +260-211-227803

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Foreword

Food Composition Tables are tables that contain specific quantities of nutrients found in a particular food. These nutrients in food form the building blocks for growth in the young and provide for the normal physiological and immune functions of the body and sustain life. When these nutrients are deficient or inadequate sub-optimal growth, malnutrition and various deficiency diseases will manifest themselves in the affected population.

More than 48% of the children under-five years in Zambia are stunted (CSO, 2006). The UNICEF (2004) reported the highest levels of stunting in Luapula Province (63%), Eastern Province (64%) and the Southern Province (44%). High endemic diseases such as HIV/AIDS, Malaria, Tuberculosis and Diarrhoea present challenges that require a nutritionally balanced diet to prevent malnutrition and reduce morbidity and mortality. Thus, it is important to consume good quantities of a variety of foodstuffs rich in the required nutrients daily in order to reduce the high malnutrition levels, combat diseases and increase human productivity in the country. Those faced with over nutrition diseases such as obesity which may lead to hypertension, diabetes and heart problems can also use information in these food composition tables to design healthy diets.

The Acquired Immune Deficiency Syndrome (AIDS) disease is a major public health and nutrition challenge in Zambia. The UNAIDS report on the Global HIV/AIDS Epidemic (2002) estimated that 21.5% of Zambians between the ages of 15 and 49 were infected with HIV at the end of 2001, with the rate rising to 25% among young women and 31% among women in urban areas who attended antenatal care clinics. As a result, some new vulnerable groups have emerged. These include households with terminally ill AIDS patients or orphans. Such households have become very high relief food dependent due to the chronic sickness that reduces household productivity or leads to the loss of productive adults due to HIV/AIDS related deaths, and the increase in single parent households that cannot produce sufficient food.

It is my conviction that these revised Food Composition Tables will assist nutritionists and dieticians in formulating diets that would meet specific nutrient needs under different physiological and pathological conditions, thereby reducing malnutrition in Zambia. They will also help in decision-making in setting dietary guidelines for various groups. The Food Composition Tables are also useful for food technology, processing, product formation, enrichment and other processes that add value to foodstuffs. They provide prioritization criteria for conserving certain food plants and reforestation. I believe the tables will enhance the understanding and appreciation of indigenous foods that have long been thought to be unimportant, thus they will increase the community food base and dietary diversity which is important in good health.

The National Food and Nutrition Commission (NFNC) of Zambia developed and produced the 1st , 2nd and 3rd editions of the Food Composition Tables for use in Zambia in 1972, 1987 and 1996 by NFNC, respectively. These tables gave the proximate nutrient content of different foods used in Zambia, both commercially and traditionally, using both common (English) and scientific names. However, the 1st , 2nd and 3rdEdition Tables had gaps in nutrient composition and some important local food stuffs had not been analyzed which are now contained in this 4th Edition.

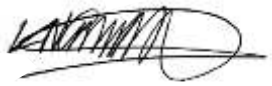
The Food Composition Research Report showed a total of 256 common foodstuffs identified and prioritized by communities representing the three ecological zones (low rainfall Siavonga and Nyimba; medium rainfall Mongu and Mkushi; high rainfall Mwinilunga and Kasama) of Zambia. The new foodstuffs include cereals, roots and tubers, fruits, nuts, seeds and vegetables in raw form, processed and cooked with groundnuts. This Fourth edition (2009) includes ninety-three (93)

community prioritized new entries of food stuffs that have been analyzed by the University of Zambia Food and Nutrition laboratory in the Departments of Animal Science and Food Science and Technology, School of Agricultural Sciences at the University of Zambia.

In addition, explanations on how to calculate the daily nutrient intake for a person given the food tuffs that they consumed have been included. A World Health and Food and Agriculture Organizations (WHO/FAO, 1972) Daily Nutrient Requirements Table has been included to assist users in determining whether the given diet meets the "Recommended Dietary Allowance, RDA" or not.

The Government of the Republic of Zambia recognizes the importance of nutrition in national development and is committed to fulfilling the Millennium Development Goals on reducing hunger and improving education. It is also important to note that the Development Index, which measure poverty, is in part determined by nutrition indicators such as stunting, and wasting among under five children, currently Zambia ranks very poor at number 167 out of 173 countries in the world. Thus, (UNDP, Development Report, 2004) good nutrition for all is imperative for our posterity.

The book also contains an annex of the local names of commonly consumed foodstuffs and pictures of what they look like to assist those living in areas where the particular foods are not commonly consumed to recognize that they are edible. It is my sincere hope that these revised food composition tables will assist in the efforts to promote the consumption of indigenous foodstuffs as well as reduce malnutrition in Zambia. It is also my hope that as funds become available, all local foodstuffs Composition will be determined and documented in these Food Composition Tables for optimal natural resource use.



Hon. Kapembwa Simbao, MP.,
Minister of Health

Acknowledgements

The Ministry of Health hereby commends all the institutions and people that have made contributions to the research and revision of the Second Zambian Food Composition Tables.

The Ministry of Health would like to express its gratitude to Boston University, Center for International Health through the Applied Child Health Research (ARCH), a United States Agency for International Development (USAID) - funded project. In particular, Professors John Simon, William Macleod and Mike Hammer from Boston University; and Dr. Mubiana Macwan'gi and Mr. Arthur Mazimba for their guidance both in proposal development, data collection, analysis and manuscript preparation and reviews. The assistance from Dr. Foston Mwape, UNZA, English Department is greatly appreciated. The Ministry also wishes to thank the National Food and Nutrition Commission for supporting and making staff available for this research.

The Ministry commends the research team comprising Dr. Drinah Banda Nyirenda, Principal Investigator and Co-investigators; Ms. Martha Musukwa and Mrs. Raider Habulembe Mugode for the research that identified over 256 common foodstuffs and added 93 new food entries and produced the 3rd Edition of Zambian Food Composition Tables.

The Ministry also wishes to acknowledge the School of Agricultural Sciences at the University of Zambia, especially the Departments of Animal Science, Food Science and Technology both the academic and laboratory staff that assisted with the various aspects of this research, including analyses and facilities. Appreciation is also expressed to the staff at the field station that assisted in sample preparation and various other services rendered.

The Ministry of Health wishes to acknowledge the late Mrs. Florence Mazala, formerly a Nutritionist with the National Food and Nutrition Commission (NFNC) who collected data for the first edition (1972) of the Food Composition Tables for use in Zambia. The second edition data was collected and compiled by Mrs. Freda Luhila and the late Dr. David Kasonso at the food Science and Technology Unit at NFNC. while the 3rd edition was compiled by Raider Habulembe Mugode. The analysis of foods were done at National Council for Scientific Research.

The Ministry gives credit to the many people in the communities who offered to share their information on indigenous food stuffs and their utilization presented herewith. Thanks are also conveyed to the field research assistants; Moses Banda (UNZA Food Science and Technology), Emmanuel Chikopela, Wiza N'gambi and Sinya Mbale for traveling to all the districts, defying malaria and the rough roads, and assisting in sample collection and preparation. The Animal Science and Food Science and Technology laboratory technicians at UNZA are also thanked for their diligent work in chemical analysis, data entry and analysis. Last but not least, thanks go to Mr. Kamanga editing pictures and the various secretaries who assisted in the development of this document.

Dr. Volepi Mtonga
Acting Permanent Secretary
Ministry of Health

Dedication

The Ministry dedicates the Zambia Food Composition Tables to the Zambian people and their future generations

List of Acronyms

AIDS	Acquired Immune Deficiency Syndrome
AOAC	American Official Analytical Chemists
CP	Crude Protein
CSO	Central Statistical Office
DNA	Deoxyribonucleic Acid
EE	Ether Extract
FAO	Food and Agriculture Organisation
FGD	Focus Group Discussion
HIV	Human Immune Virus
FHANIS	Food Health and Nutrition Information Systems
GE	Gross Energy
NCSR	National Council for Scientific Research
NFNC	National Food and Nutrition Commission
NISIR	National Institute of Industrial and Scientific Research
PLA	Participatory Learning Activities
PRA	Participatory Rural Appraisal
RDA	Recommended Dietary Allowances
RNA	Ribonucleic Acid
SPSS	Statistical Programme for Social Sciences
SAP	Structural Adjustment Program
TDRC	Tropical Diseases Research Center
UNICEF	United Nations Children's Fund
UNZA	University of Zambia
USAID	United States Agency of International Development
WHO	World Health Organisation

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Glossary of Terms

Amino acids The structural units of protein.

Beverages Any liquid used or prepared for drinking is a beverage.

Calorie (cal) This unit, which is always written with a small c, is the amount of energy heat required to raise the temperature of 1 gram of water 1ºC. It is equivalent to 4.184 joules.

Carbohydrates These are organic compounds composed of Carbon (C), Hydrogen (H) and Oxygen (O). This group includes sugars, starch, cellulose, gums and related substances.

Detoxification A process by which poisonous substances are rendered less harmful. Most of The detoxification reactions in the body take place in the liver.

Diarrhoea Rapid movement of the faecal matter through the digestive system producing frequent, watery stools. It may be caused by a wide variety of disorders, including bacterial contamination of food, virus infection, allergy, nervous reaction, as well as various serious and chronic ailments.

Diet The beverages and foods normally consumed by a person. However, most people take the term diet to mean specially designed foods and beverages to be taken in measured amounts, while other items are restricted.

Dry matter The part of a food which is not water. Dry matter is found by determining the percentage of water and subtracting the water content from 100%.

Endemic A term referring to a disease that is continually present in agiven population. It is in contrast to the word epidemic which refers to type of disease that suddenly appears in a given area.

Enrichment This refers to the addition of specific nutrients to a food as established in a national standard of identity and quality. The amounts added generally are moderate and include those commonly present at even lower levels.

Fat The term fat is used in a general sense to include both fats and oils or a mixture of the two. Both fats and oils have the same general structure and chemical properties, but they have different physical characteristics. The melting points of fats are such that they are solid at room temperature, while oils have lower melting points and are liquids at room temperature.

Fortification This refers to the addition of specific nutrients to foods. The amounts added are usually in excess of those normally found in the food because of the importance of providing additionalamounts of the nutrients in the diet.

Gross Energy The amount of heat, measured in calories, that is released when a substance is completely oxidized by burning in oxygen.

Growth The increase in size of bones, muscles, internal organs andother parts of the body.

Infection A condition that occurs when the body is invaded by disease producing germs or microorganisms.

Intrauterine Within the uterus.

Kwashiorkor A syndrome produced by a severe protein deficiency, with characteristic changes in pigmentation of the skin and hair, oedema, skin lesions, anaemia and apathy.

Macronutrients These are nutrients that are present in the body in amounts ranging from a few tenths of a gram to one or more grams. Macronutrients include fat, water, protein, calcium, phosphorus, sodium, chlorine, magnesium, potassium, and sulphur.

Malnutrition An impairment of health resulting from a failure of the physiological processes of the body itself, to provide nutrients to the tissues in correct proportions. Thus malnutrition may involve nutrient deficiencies, excesses of nutrients such as carbohydrates, or a combination of deficiencies and excesses.

Metabolizable Energy This is defined as the Gross Energy of food minus energy lost in feaces, urine, and gaseous products of digestion. Metabolizable energy is the energy available to the body.

Micronutrients These are nutrients that are present in the body, and required by the body in minute quantities, ranging from millionths of a gram (microgram) to thousandths of a gram (milligram).

Moisture A term used to indicate the water contained in foods, expressed as a percentage.

Morbidity The condition of being diseased; within a given population. The number of sick persons or cases of disease recorded as of a stated point in time or over a stated period.

Nutrients Nutrients are the chemical substances found in food that can be used, and are necessary for maintenance, growth and health of people.

Nutrition Nutrition can be defined as the science of food and its nutrients and their relation to health.

Parasites Broadly speaking, parasites are organisms living in, on, or at the expense of another living organism.

Pathology The science dealing with diseases; their essential nature,causes, and development, and the structural and functional changes produced by them.

Protein Chemically, proteins are complex organic compounds made up chiefly of amino acids.

Recommended Dietary The RDAs are estimates, not standards, for meeting the Allowance nutritional needs of a group of people. If nutrients are consumed at the level of the RDA, the needs of nearly all healthy members of the group will be satisfied, since the RDAs are not averages, but calculated for individuals with the highest requirements.

Supplements Food supplements are foodstuffs or nutrients used to improve the value of basal foods.

1.0 Introduction

Food Composition Tables are tables that contain specific quantities of nutrients found in a particular food. These nutrients in food form the building blocks for growth in young, provide for the normal physiological and immune functions of the body and sustain life. When these nutrients are deficient or inadequate sub-optimal growth, malnutrition and various deficiency diseases will manifest themselves in the affected population.

More than 48% of the children under-five years in Zambia are stunted (CSO, 2006). The UNICEF (2004) reported the highest levels of stunting in Luapula Province (63%), Eastern Province (64%) and the Southern Province (44%). High endemic diseases such as HIV/AIDS, Malaria, Tuberculosis and Diarrhoea present challenges that require a nutritionally balanced diet to prevent malnutrition and reduce morbidity and mortality.

Some specific nutrients cause specific disease symptoms that can only be cured by the supplementation of the missing nutrient. The importance of nutrients in growth or development have been illustrated through the study of nutrient deficiencies such as Vitamin A and Iron deficiency in child morbidity (Shankar et. al, 1997). The importance of zinc in human metabolism and growth both in health and disease is well established (Prasad et. al., 1961). Zinc is essential in the maintenance of the structure of biological membranes (Bettger and O'Dell, 1981), DNA and RNA synthesis (Wu and Wu, 1987) and metabolism of essential fatty acids (Clejan et. al., 1982) making it an essential micronutrient in pregnancy. Zinc supplementation has been shown to reduce malaria parasites and all general morbidity indicators such as acute diarrhoea, persistent diarrhoea and acute respiratory infection (Sazawal et. al., 1996 and 1998, Shankar and Prasad, 1998). Zinc was also, reported to improve the linear growth and weight of school children (Krebs et. al., 1984 and Walravens et. al., 1983). Sikatulu et. al. (1997) reported a high prevalence of malaria in Monze district of Zambia and showed that malaria increases iron losses from the body.

These studies emphasize the importance of nutrients such as zinc, iron and vitamin A in health and hence the need to ensure adequacy in their daily intake Thus, it is important to consume good quantities of a variety of foodstuffs rich in the required nutrients daily in order to reduce the high malnutrition levels, combat diseases and increase human productivity in the country.

Food Composition Tables provide the nutrient content of various foodstuffs that can be used to estimate the adequacy of a diet in meeting the physiological needs of an individual for optimal productivity, growth and health. To achieve meaningful reduction in the high malnutrition rates, high incidences of nutritional related endemic diseases such as HIV/AIDS, Tuberculosis and Malaria require good nutrition. Good nutrition can be provided by consuming a diversified diet of foods that are high in nutrients that provide energy, protein for growth and repair and vitamins and minerals for optimal use of foods, skeletal maintenance and the well being of the individual.

In order to determine what a foodstuff contains, a chemical analysis of nutrient composition is carried out. It is important for each country to have its own accurate, reliable and up-to-date food composition database that depicts the nutrients in the foodstuffs available and commonly consumed by its people. This necessitated the determination of nutrient composition and documentation of the different local foodstuffs that were not in the 1st, 2nd and 3rd editions of Zambian Food Composition Tables. Some of the foodstuffs in the 1st, 2nd and 3rd Editions of Zambian Food Composition Tables were derived from literature.

Zambia has three main ecological/rainfall zones that have distinct vegetation differences. Although

many foodstuffs are common in many areas, some species of foods are specific to certain areas. In addition, some foodstuffs are not known as foods in other areas and therefore not utilized as such. As a result, identification and collection of samples from the three zones was done to depict annual variability and availability in food and species differences and these were added to the 4th edition.

This Fourth Edition (2009) of Zambian Food Composition Tables includes ninety-three (93) community prioritized new entries of food stuffs that have been analyzed by the University of Zambia Food and Nutrition laboratory in the Departments of Animal Science, Food Science and Technology, School of Agricultural Sciences at the University of Zambia (Annex 4).

2.0 Arrangement of the Food Composition Table

The foods in the Food Composition Tables have been grouped into the following categories with each food appearing in only one group: Cereal and cereal product; Starchy roots and plantain; Beans, Oilseeds and nuts; Vegetables; Fruits; Fish, Meat, Poultry and game; Insects; Eggs, Milk and milk products; Sugar; Oil and fats; Beverage foods.

3.0 The Food Groups and their Uses

3.1 Cereal and Cereal Product

Cereals such as maize, sorghum, millet and rice are important sources of energy in form of carbohydrate. They form a large component of any given diet (60-70%). In most poor countries like Zambia, the poor may consume up to 95% of their diet as carbohydrate. In lean times when food is insufficient, energy becomes a limiting factor as less carbohydrate is consumed. For young children, too much carbohydrate may lead to malnutrition that is manifested as stunting and in extreme energy deficiency leading to marasmus (wasting). In adults, too little carbohydrate leads to low energy and wasting and poor work output. In most Sub-Saharan Africa, energy intake is usually below the recommended daily allowance of 2200 kcal for adult women and 3000 kcal for adult men (WHO/FAO, 1988).

3.2 Starchy Roots, Tubers and Plantain

Starchy roots (cassava), tubers (sweet potatoes, yams) and plantains are good sources of energy as carbohydrate. Starchy roots like cassava and sweet potatoes are highly perishable in their succulent state unless dried. These are good sources of energy like the cereals. However, roots like cassava may contain highly toxic cyanide compounds that require leaching or vaporising. Thus, pre-processing is critical for food safety. Sweet potatoes are an important energy source but are highly perishable unless dried as chips or cooked and dried for later use. Some wild roots and tubers are extremely toxic and only eaten after long processing to remove the poison.

3.3 Beans, Oilseeds and Nuts

Beans and oilseeds and nuts are generally high in oil and therefore are high-energy sources. The oilseeds and nuts are also high in protein. Pulses (such as beans, cowpeas, soybeans) are the most common source of protein for most poor households, although due to the high demand for beans in urban areas and the need for cash, the rural households use it as a cash crop. Despite the knowledge of the importance of these pulses as sources of the much-needed protein for growth, particularly for children, very little is consumed as most is sold for cash as a result malnutrition is very high in under-five children. Severe protein deficiency leads to Kwashiorkor, which is common in malnourished hospital admitted under five children.

3.4 Vegetables

Wide varieties of vegetables grow both in the wild and domesticated. Vegetables are a good source of vitamins and minerals for repair and strengthening the immune system. Despite the abundance of vegetables in the rain season, very little is consumed culturally as people tend to cook less and eat less. During dry seasons, there is very little vegetable. Drying can preserve vegetables, however most methods of parboiling before drying leach out the desired nutrients, thereby reducing their nutritive value. In addition, preserving vegetables is quite time consuming and competes with the weeding season and hence very little is preserved by most households. However, preservation and keeping gardens provide important sources of vegetables.

3.5 Fruits

A wide variety of local fruits are found throughout Zambia. Some have economical value such as *Masuku*, Mabuyu or *Masau*. Fruits are a good source of vitamins and minerals and energy. Most wild

fruits are consumed in season and there is very little or no preservation. Some fruits contain nuts as seed and these are high in both energy (oil) and protein.

3.6 Fish

Fish are an excellent source of protein and minerals. Zambia has a large share of fresh waters from rivers and lakes, which keep a lot of fish. However, fish still remains an expensive commodity because of low availability. The fish industry has never taken off as a business at large scale by Zambians. There is very little fish farming despite the proximity of many rivers, dambos and lakes. Most rural households capture fish for cash sales and very little for home consumption.

3.7 Meat, Poultry and Game

Meat from cattle, pigs, poultry or game is an important source of protein and minerals. Very little meat is consumed by most poor households because it is an expensive commodity. Livestock production in Zambia is very low despite the high potential in most areas. There are vast pastoral lands for cattle but poor management leads to high mortality rates due to disease and lack of good husbandry and feeding. Culturally, cattle are kept as wealth and rarely slaughtered for food except for special functions. Game meat is scarcely consumed because conservation of wildlife has taken root, communities are in fear of being arrested and therefore consume very little game.

3.8 Insects

Zambia has a wide variety of edible insects such as caterpillars and ants. The insects are rich in protein and minerals. Insects are seasonal and their availability depends on the communities recognising them as food. Drying usually preserves insects and these can be consumed later or sold for cash.

3.9 Eggs, Milk and Milk Products

Eggs have the best and highest quality protein. Eggs are generally produced by chickens and ducks on the range in villages and peri-urban areas with hybrid types produced intensively for commercial use. Due to poor nutrition, the village chicken is less productive and takes a long time to grow and reproduce. The few chickens produced in rural areas are sold for cash and as a result very little in eggs or chicken meat is consumed.

Milk and milk products are high in protein, energy and minerals. Milk and milk products are not universally consumed in Zambia, except in tea and some cultures such as among the Tonga and Lozi people where traditionally cultured milk is consumed as a beverage and used as relish.

3.10 Sugar

Sugar is a high-energy supplement and is widely used in beverages and its source, the cane sugar can be chewed raw. Sugarcane, both the cane for making sugar and the sweet sorghum stems, is produced in Zambia. Granulated sugar is less accessible by poor households due to its high market value.

3.11 Oil and fats

Fats and oils are important as sources of supplemental energy and essential fatty acids. Oils also enhance the palatability of foods. These are consumed as vegetable oils or fats extracted from nuts and meat. Oils and fats are usually costly and hence accessibility by poor households is low, leading to low energy diets.

3.12 Beverages

Beverages are important sources of B-vitamin (due to fermentation), minerals and energy and are made from a variety of foodstuffs that include cereals, roots and fruits. These can be fermented both as alcoholic and non-alcoholic drinks.

4.0 Use of the Food Composition Tables

Food Composition Tables or databases are used by researchers, health care workers, education personnel, community nutritionists, dieticians, and persons in charge of food service in hotels, restaurants, hospitals, schools, prisons, rehabilitation and drop-in-centers. They are used to assess nutrient content of the diet in relation to daily requirements and improving the dietary and, consequently, the nutrition status of those consuming them. These experts use the tables for dietary recommendations, diet formulation and decision making for supplementation or fortification. In addition, the food industry uses them for product development and formulation, enrichment and other processes that add nutritive value. At national level, Food Composition Tables are utilized for developing dietary guidelines and establishing national minimum nutrient requirements for various physiological and pathological conditions.

The tables can also be used for advisory purposes by nutritionists to influence policy makers on specific nutritional issues and national policy that affect the nutritional well being of the people. The tables can be used to assess the nutritional status and needs of a population consuming some locally available foodstuffs. The Food, Health and Nutrition Information Systems (FHANIS, 1998) recommended that the Food Composition Tables can also, be used to develop an electronic food composition database for Zambia. Therefore, knowledge of nutrient content of Zambian foods is imperative in order to make guidelines and recommendations that are specific or universal in regards to nutrients in a variety of foodstuffs.

In addition, nutritionally balanced diets are important in preventing malnutrition and reducing morbidity due to a variety of diseases endemic in Zambia such as HIV/AIDS, Tuberculosis, Malaria and diarrhoea (National Guidelines NFNC, 2003). An alternative to micronutrient supplementation would be to consume a variety of foods rich in required nutrients. Thus the existence of data on food composition would assist nutritionists and dieticians in formulating diets that would meet specific nutrient needs under different physiological and pathological conditions. This would result in the recommendation of efficient utilization of local foodstuffs, thus increasing the community food diversity and food base.

The tables can also be used as a guide in nutrition education. The tables of food composition will provide the amounts of nutrients per unit weight of the food and hence, using dietary recall information they can calculate the nutrient intake and determine whether the person is consuming enough food to meet the daily needs for the various physiological demands.

The tables can also assist in forestry resource conservation of useful plants and in agriculture for improving productivity and increasing diversification both in production and consumption.

5.0 Why Dietary Nutrients are Important

Nutrients in the diet are important in providing substrate for the various physiological functions of the living organism, which include growth, reproduction, and maintenance of physiological activity and productivity. In deficit or absence, physiological processes are impaired leading to nutritional deficiency symptoms and can only be restored by including them as dietary supplements or feed sources.

Infectious diseases such as respiratory tract infections, diarrhoea diseases and intestinal parasites cause nutritional imbalances. A relationship was found between maternal qualitative malnutrition and micro nutrient deficiency with intrauterine growth retardation (Venkatachalam *et. al.,* 1962) and pre-term delivery (Bahl *et. al*, 1994). In addition, the inadequate intake of dietary energy and specific nutrients contribute to malnutrition (Hautvast, 1993). Malnutrition also contributes to increased morbidity and mortality by increasing the risk of contracting infectious diseases and worsening the severity of an episode (Sazawal *et. al.*, 1998).

The assurance or the recommendation for nutrient supplementation can be made based on the dietary content of the known nutrients and the physiological condition of the relevant population. Folic acid has been shown to be important in pregnancy (Baynes *et. al.,* 1986). Due to high incidences of anaemia, Zambia practices universal supplementation of iron and folic acid to pregnant women who attend antenatal clinics as recommended by the Food and Agriculture Organization of the United Nations (1988). However, the long-term strategy should promote routine consumption of foods containing high iron and folic acid.

In addition, malnutrition is a common complication of HIV/AIDS and other infectious diseases such as Malaria, Tuberculosis, respiratory infections and Diarrhoea in which a lot of body and ingested nutrients are lost leading to body wasting.

The Food Composition Tables can also be used to promote consumption of indigenous foodstuffs to increase the variety of available foods for effective nutrition interventions in improving immune response against infections, thereby prolonging life and lowering health care costs because of fewer complications of opportunistic illness.

6.0 How to Calculate the Nutrient Content using the Food Composition Tables

When the amount of food consumed is known, one can easily calculate the nutrient content of the foods they are about to eat or what they have eaten and determine whether the foods meet the recommended daily allowance (RDA) of nutrients.

An example is given below:

6.1 Calculation of Energy, Protein, Vitamin C, and Iron content in a given dietary intake for a day:

6.1.1 Snack Eaten

If a person eats the snacks indicated, the nutrients taken can be calculated following the steps below:

½ Large Tomato
1 Medium Orange
2 Large bananas

Step 1.

Check for the nutrient composition of the tomato, orange and banana. Write down the nutrient content of the foodstuff as indicated in the table below.

Table 1. Nutrient Composition from the Food Composition Tables per 100g Portion (Extract from Table 3)

Foodstuff	Nutrient				
	Water %	Protein g	Calories, ME cal	Vitamin C mg	Iron mg
Roller meal dry wt	12	7.5	363	-	2.5
Cowpeas dry wt	10	22	346	-	5
Cassava leaves	70	11	109	381	.07
Masau fruit	80	1.37	68	59	3.3
Banana (Large)	76	2.4	176	20	0.5
Orange (Medium)	86	1.4	68	74	0.4
Tomato (Large)	94	2.0	40	46	1.3

Step 2. Calculation:

Then calculate the nutrient content as shown for energy and protein below:

Energy

- Contribution of 2 large bananas
  1 banana = 176 cal
  2 bananas = 2 x 176 = 352 cal
- Contribution of 1 orange = 68 cal
- Contribution from ½ tomato
  Since 1 large tomato gives 40 cal, ½ will give ½ x 40 cal = 20 cal

Total Energy from consuming the above (½ large tomato, 1 medium orange, 2 large bananas) is equal to:

= 352 + 68 +20 = **440 cal**

Protein

Total protein consumed from mixed fruit will be as follows:

- Protein contribution from 2 large bananas
  1 banana = 2.4g
  2 bananas = 2 x 2.4g = 4.8g Protein
- Contribution from 1 orange = 1.4g
- Contribution from ½ tomato = ½ x 2g = 1.0g (since 1 tomato gives 2g protein)

Total Protein = 4.8 + 1.4 + 1.0 = **7.2g**

6.1.1 Recommended Daily Allowance (RDA)

Step 3.

Then compare the nutrients consumed with RDA's. An example is given below from the consumption of the three snacks above.

The Recommended Daily Allowance (RDA) is the amount of nutrient(s) required by an individual of a specified age and physical and physiological status as shown in Annex 2.

Example: Given that an adult moderately active woman requires 2,200 kcal energy, 37g protein, and 30mg vitamin C (Ascorbic Acid), calculate from the above given nutrient composition the nutrients provided by the snack and main meal and determine whether they meet the RDA of this woman.
The Snack:

The 2 bananas, orange and ½ tomato will provide about 20% energy (440 kcal of the 2,200 kcal) and 16% protein (7.2g of the 37g protein) needs for the day. Similarly, one can calculate the vitamin and mineral content of these fruits and determine their contribution to the daily requirements.

6.1.3 Foods Eaten at Main Meal by an adult Woman in Moderately active Stage

Step 4.

Nutrients can be calculated for the other foods eaten during the day as main meals such as breakfast, lunch and supper. For example, if the same person had the main meal indicated below various nutrients can be calculated as shown in Table 2.

300 g nshima on dry meal wt
50 g cowpeas dry wt relish
50 g cassava leaves boiled
100 g masau fruit as snack

Table 2. Calculated Consumed Nutrients Using the Nutrients in Table 1

The Calculated Dietary Nutrients Were:

Foodstuff	Nutrient Content				
	Water %	**Protein (g)**	**Calories, ME (cal)**	**Vit. C (mg)**	**Iron (mg)**
300g Roller meal dry wt	12	22.5	1,089	-	7.5
Cowpeas dry wt	10	11	173	-	2.5
Cassava leaves	70	5.5	54.5	195.5	0.035
Masau fruit	80	1.37	68	59	3.3
Sub-total nutrients from meal		**40.37**	**1,384.5**	**254.5**	**13.34**
Total Nutrient Consumed					
Sub-total nutrients from meal		40.37	1,384.5	254.5	13.34
Sub-total nutrients from snack		7.2	440	177	2.2
Total Nutrients Eaten for the day		**47.57**	**1,824.5**	**431.5**	**15.54**
RDA		**37**	**2,200**	**30**	
Surplus/Deficit RDA		**+10.57**	**-375.5**	**+401.5**	

6.1.4 Interpretation

Based on the RDA in Appendix 4 Table 5, the woman had excess protein and vitamin C intake, but the energy intake was deficient. The woman would be losing body condition to make up for the reduced energy intake. The extra protein would also be used as an energy source. The use of protein for energy is not only expensive but puts an extra burden on the body to get rid of the ammonia formed.

7.0 The revised 4th Edition Food Composition Tables

7.1 Methods of Analysis

The Association of Official Analytical Chemists (AOAC, 1988, Nielsen, 1995) methods were used to determine proximate analysis (moisture, crude protein, crude fat, crude fiber and ash), vitamin C (Ascorbic Acid), iron and zinc. The National Research Council (NRC) No. 19 formulae were used to calculated Gross Energy (GE) and Metabolizable Energy (ME) CNRC, 1979.

7.2 Nutrient Composition of Prioritised New Foodstuffs Included in the Revised Food Tables

Table 4, in the appendix 3 shows the nutrient composition of the selected prioritized foodstuffs that were analyzed in this research and are not in the 1st , 2nd and 3rd editions of Food Composition Tables on air-dry basis. The table has been broken down further into several groups of the nutrients of some important common foodstuffs. These comprise the raw relishes, relishes boiled with or without groundnuts and wild fruits. This table has been integrated in the revised 4th edition Food Composition Tables below shown by a star.

7.3 The 4th Edition of Zambian Food Composition Tables (2007)

The Food Composition Tables are based on composition of the edible portion in the form the food is eaten such as air-dry basis and fresh basis for vegetables. The old tables (1st , 2nd and 3rd editions, 1967 and 1987, 1996 respectively) had only a few of the figures based on analysis made locally; the rest were derived from published food tables. Calorie values are calculated as follows: 1 g protein or carbohydrate supplies 4 calories, 1 g fat supplies 9 calories. The 4th edition includes 93 food entries (bearing a star superscript) that were analyzed (Table 4 in Appendix 3) locally at the University of Zambia, Food and Nutrition Laboratories using the Analytical Official Methods of Analysis and National Research Council.

Table 3: The Revised Zambian Food Composition Tables

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
I. CEREAL AND CEREAL PRODUCTS																
MAIZE *(Zea mays)*																
1. Breakfast Meal		12	354		7	0.5	80.5	0.7	9	2	-	0	0.05	0.3	0.6	0
2. Roller Meal (90% Extr)	-	12	363		7.5	3.5	75.5	1.5	12	2.5	-	9	0.3	0.13	1.5	0
3. Traditional polished Flour Dry Mealie, Meal, Rice and Samp * Soaked, Pounded and Winnowed, Extraction Rate about 55%	-	12	360	-	8	1.3	79	0.3	5	2	-	0	0.04	0.17	0.7	0
4. Traditional Flour Wet	0	34	269	-	6	1	59	0.2	4	1.5	-	0	0.03	0.013	0.5	0

Extr *means Extraction*

\- *means missing or undetermined value*

* *New analysed addition*

* *New determined food stuffs*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
5. Whole, White (Also Unsifted hammer mill or straight - run meal)	0	12	366	-	8.5	4	74	2	12	2.5	-	9	0.35	0.13	2	0
6. Whole, Yellow	0	12	366	-	8.5	4	74	2	12	2.5	-	45	0.35	0.13	2	0
WHEAT																
7. Wheat Bread 70% Extr	-	36	279	-	8	1.2	52	-	17	1.8	-	0	0.2	0.06	1.7	0
8. Wheat Flour 70% Extr	-	12	354	-	10	1	76	0.1	12	1.5	-	0	0.08	0.05	0.8	0
9. Wheat Flour 80% Extr	-	12	356	-	11	1.3	75	0.8	15	2	-	0	0.24	0.06	1.6	0
10. Wheat, Bread *Triticum Sp* 80% Extr	-	36	256	-	8	0.9	54	0.6	11	1.4	-	0	0.17	0.04	1.2	0

Extr *means Extraction*

\- *means missing or undetermined value*

* *New analysed addition*

* *New determined food stuffs*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
FINGER MILLET *Digitaria Hale Exilis*																
11. Flour (Stone Pounded, 80% Extr)	20	12	348	-	6.6	2	76	2.9	265	4	-	0	0.34	0.16	0.7	0
12. Whole	0	12	348	-	6.6	2	76	2.9	265	4	-	0	0.56	0.19	0.7	0
BULRUSH MILLET *Pennisetum Typhoides*																
13. Flour (Hand Pounded 75% Extr)	25	16	339	-	6.4	3.5	70.5	0.6	17	2	-	0	0.18	0.22	1.6	
14. Whole	0	12	354	-	7.6	4	72	2.2	22	3	-	0	0.5	0.22	1.7	0

Spp *means species*
Extr *means Extraction*
- *means missing or undetermined value*
* *New analysed addition*
* *New determined food stuffs*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
SORGHUM *Sorghum Spp*																
15. Flour (Hand Pounded 66% Extr)	34	16	343	-	9.9	2.6	70	0.6	14	3	-	0	0.05	0.95	3	-
16. Whole sorghum	0	12	359	-	10.4	3.7	71	2	20	4	-	0	0.3	0.08	3.5	-
RICE *Oryza Sativa*																
17. Highly Milled	0	12	353	-	7	0.5	80	0.2	5	1	-	0	0.25	0.03	1.6	-
18. Under milled or Parboiled Rice *Oryza Sativa*	-	12	353	-	8	1.5	77	0.5	10	2	-	0	0.25	0.05	3	-
19. Lusitu Rice (Whole)	0	10	309	377	6	1	-	1.15	1.1	20.87	0.56	-	-	-	-	100.8

Spp *means species*
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* *New analysed addition*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
Other Maize Produce																
20. Mealie Rice	-	11.4	366	-	8.9	1.5	77.7	0.8	12	1.8	-	-	0.05	-		-
21. Maize Samp	-	11	366	-	8.2	0.7	79.8	0.4	7	2	-	-	0.06	0.05	0.3	-
22. Cerelac Instant	-	-	421	-	15.4	9	68	-			-	204	-	0.3	4	-
23. Milk Cereal (Nestum)	-	-	355	-	9.3	1	76.6	-	279	18.5	-	140	-	0	8	-
II. STARCHY ROOTS AND PLANTAIN																
24. *Aerial Yam	-	70	103	113	1.9	0.2	-	-	0.38	3.53	0.9	-	-	-		65.12
25. *Busala (Boiled) *Dioscorea Hirtiflora*	15	51.94	148	167	3.41	0.32	-	-	0.45	7,88	0.42	-	-	-	-	1.12

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* *New analysed addition*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
26. *Busala (Cooked With Groundnuts) *Dioscorea Hirtiflora*	15	48.01	229	261	9.13	13.35	-	-	0.5	5.08	1.64	-	-	-	-	2.45
27. *Busala (Raw) *Dioscorea Hirtiflora*	15	55	318	358	4.15	0.22	-	-	0.4	8.87	0.42	-	-	-	-	0.59
28. Cassava Flour	15	12	342		1.5	0	84	1.5	55	2		0	0.04	0.04	0.8	-
29. Cassava, Fresh *Manihot Utilissimus*	-	60	153	-	0.7	0.2	37	0.1	25	1	-	0	0.07	0.03	0.7	-
30. *Coco Yam *Dioscorea Spp.*	15	70	106	125	1.1	0.51	-	-	0.72	0.63	0.31	-	-	-	-	0.39
31. Irish Potatoes *Solanum*	-	80	75		2	0	17	0.4	10	0.7		0	0.1	0.03	1.5	-
32. *Kasona Yam *Dioscorea Spp.*	-	70	102	120	1.72	0.2	-	-	0.52	0.59	0.37	-	-	-	-	0.79

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* *New analysed addition*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
33. Livingstone *Celens Spp.*	-	75	80	-	2	0	17	0.4	10	0.7	-	0	0.1	0.03	1.5	-
34. *Njamva Yam *Dioscorea Spp*	-	70	101	119	3.22	0.2	-	-	0.62	1.26	0.54	-	-	-	-	0.56
35. Orchid Roots *Satyria Siva*	-	70	117	-	1.3	0	28	-	48	8	-	-	-	-	-	-
36. Plantain *Musa Panasisaica*	-	67	128	-	1	0.2	31	0.3	7	0.5	-	30	0.05	0.05	0.7	-
37. Sweet Potatoes *Ipomoea Batatas*	-	70	114	-	1.5	0.3	26	0.5	126	0	-	30	0.1	0.04	0.7	-
38. *West African Yam *Dioscorea Spp*	33	70	102	120	1.23	0.2	-	-	0.5	0.62	0.51	-	-	-	-	0.23
39. *Wild Bitter Yam Cooked Chaama		70	106	-	0.79	0.4	-	-	0.35	3.89	0.01	-	-	-	-	24.52
40. Yam *Dioscorea Spp.*	-	73	104	-	2	0.2	24	0.5	10	1.2	-	6	0.03	0.03	0.4	-

Spp *means species*
- *means missing value*
Extr *means Extraction*
- *means missing or undetermined value*
* *New analysed addition*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
III. BEANS, OILSEEDS AND NUTS																
41. *Avocado Seeds (Dry) *Persea Americana*	-	10	324	390	5.17	2.94	-	1.6	0.92	3.54	0.7	290	0.11	.20	1.6	14
42. Baobab Seeds (Dry) *Adansonia Digitata*	-	8	490	-	30	30	25	3	266	14	-	0	1.4	0.13	1.4	-
43. Butter Bean (Dry) *Phaseolus Lunatus*	-	10	330	-	20	1.5	59	5	92	6	-	0	0.5	0.14	1.5	-
44. *Chalimbana Groundnuts *Arachis Hypogea*	-	5.99	502	645	27.1	39.65	-	-	1.13	4.39	2.46	-	-	-	-	-
45. Cowpea (Dry) *Vigna Unguiculata*	0	10	346	-	22	1.5	60	4	90	5	-	6	0.9	0.15	2	-
46. *Dark Red Bean *Phaseolus Vulgaris*	0	8.97	316	477	21.87	1.55	-	-	0.72	0.35	0.01	-	-	-	-	76.75

Spp means species

means missing or undetermined value

* New analysed addition

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	**Moisture g**	**Food Energy (ME) cal**	**Gross Energy (GE) cal**	**Protein g**	**Fat g**	**(None fiber) Carbohydrate g**	**Fiber g (crude)**	**Calcium mg**	**Iron mg**	**Zinc mg**	**Vitamin A ug**	**Thiamine mg**	**Riboflavin ug**	**Nicotine Acid mg**	**Vitamin C mg**
47. *Green Gram (Dry) *Phaseolus Aureus*	0	7.01	319	337	24.5	0.77	-	-	1.45	12.05	0.55	-	-	-	-	38.63
48. Green Pea (Dry) *Pisum Sativum*	0	10	337	-	25	1	37	4.5	70	3	-	30	0.8	0.2	2.5	-
49. Ground Pea or Earth *Voandzeia*	-	10	367	-	18	6	60	3.3	63	6	-	0	0.3	0.1	2	-
50. Groundnuts (Dry or Paste)	0	6	579	6.45	27	45	17	3	50	2.5	-	0	0	0.15	17	-
51. *Groundnuts (Dry, Raw) Chalimbana	0	5.99	502	645	27.1	39.65	-	-	1.13	4.39	2.46	-	-	-	-	-
52. Groundnuts (Fresh *Arachis Hypogea*	-	45	332	-	15	25	12	1.5	30	1.5	-	0	0.5	0.1	10	-
53. Haricot Bean (Dry) *Phaseolus Vulgaris*	0	10	339	-	24	1.7	57	4.5	100	6	-	15	0.1	0.15	0.5	-

\- *means missing or undetermined value*

* *New analysed addition*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
54. *Kabulangeti Bean *Phaseolus Vulgaris*	-	8.89	315	406	18.8	1.4	-	-	0.4	0.05	0.2	-	-	-	-	109.02
55. *Makulu Red Groundnuts *Arachis Hypogea*	0	4.12	547	792	25.2	48.11	-	-	1.06	11.1	0.46	-	-	-	-	57.65
56. *Mungongo Nut	0	10	549	668	22.38	54.56	-	-	1.21	13.03	0.09	-	-	-	-	45.91
57. Pumpkin Seeds, Skin Citrullus Removed (Dry) *Vulgaris*	-	4	610	-	30	50	10	2	40	10	-	9	0.2	0.2	2	-
58. *Sesame Seeds *Ceratotheca Sesamoides*	-	2.48	492	603	19.24	42.72	-	-	1.32	-	-	-	-	-	-	-
59. *Solwezi Bean *Phaseolus Vulgaris*	0	10.93	309	407	19.9	1.57	-	-	1.83	0.06	0.06	-	-	-	-	105.02
60. Soya Beans (Fresh) *Clycine Max*	-	10	373	-	34	17.5	20	4.3	200	7	-	0	1.1	0.3	2	-
61. Velvet Bean (Dry) *Stolozobium*	0	10	351	-	24	5	53	5	130	5	-	15	0.5	0.2	1.7	-
[a]62. Mucuna Purensis *Velvet - Beans local white*	-	9.62	-	-	24.7	3.9	-	-	-	-	-	-	-	-	-	-
[a]63. Mucuna Purensis *specled Velvet Beans*	-	8.24	347	572	24.5	5.4	-	-	-	-	-	-	-	-	-	-

\- *means missing or undetermined value*

* *New analysed addition*

[a] *Nyirenda et. al, 2002*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
64. *White Bean *Phaseolus Vulgaris*	-	9.69	312	425	17.06	1.55	-	-	0.5	0.08	0.03	-	-	-		161.54
IV. VEGETABLES AND MUSHROOMS																
65. Dark Green Vegetables	20	85	48	-	5	0.7	5	1.5	250	4	-	900	0.1	0.3	1.5	-
66. Light Green Vegetables	20	93	23	-	1.5	0.2	4	0.8	40	0.5	-	9	0.05	0.05	0.3	-
67. Medium Green Vegetable	20	91	28	-	2	0.3	4	0.8	80	2.5	-	300	0.08	0.2	0.5	-
68. *Amankolobwe (Dry) Boiled *Cucurbitus Spp*	20	70	93	108	3.38	0.1	-	-	0.51	10.45	2.7	-	-	-	-	0.62
69. *Amankolobwe (Dry) Cooked With Groundnuts *Cucurbitus Spp*	-	73.29	119	137	5.23	8.04	-	-	0.37	6.41	0.51	-	-	-	-	0.34
70. *Amankolobwe (Dry) *Cucurbitus*	-	6.77	286	330	22.2	5.32	-	-	2.01	86.38	2.58	-	-	-	-	3.56

- *means missing or undetermined value*
* *New analysed addition*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
71. *Banyime Mushrooms (Dry) *Lactarius Spp (Russulaceae)*	-	10.98	298	450	30.39	4.6	-	-	0.99	1.35	0.02	-	-	-	-	125.23
72. Baobab Leaves (Dry)	-	12	282	-	12.3	3.1	63.2	9.7	2,241	24	-	4,800	0.13	0.82	-	-
73. Baobab Leaves (Fresh) *Adansonia Digitata*	-	77	69	-	3.8	0.3	16.1	2.8	402	-	-	3,000	-	-	-	-
74. *Bean Leaves (Dry)	-	10.6	277	4.36	22.6	3.2	54.6	-	1,556	12	-	-	-	-	-	549.35
75. *Bean Leaves (Fresh) Boiled *Phaseolus Vulgaris*	-	92.56	24	33	5.17	0.3	-	-	0.26	4.55	0.03	-	-	-	-	12.4
76. *Bean Leaves (Fresh) Cooked With Groundnuts *Phaseolus Vulgaris*	-	74.74	124	161	6.46	9.13	-	-	0.4	2.95	0.45	-	-	-	-	123.34
77. *Bean Leaves (Fresh, raw) *Phaseolus Vulgaris*	-	64	118	166	10.51	1.34	-	-	0.99	0.05	0.01	-	-	-	-	102.77

\- *means missing or undetermined value*

* *New analysed addition*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
78. Bean Leaves Fresh *Phaseolus Lunatus*	-	64	110	-	13	0.8	8.3	2	109	8.2	-	1,500	0.2	0.37	2.1	-
79. *Black Jack (Dry, raw) *Bidens Pilosa*	-	6.72	316	363	30.01	3.25	-	-	2.08	76.2	0.97	-	-	-	-	193.2
80. *Black Jack Boiled *Bidens Pilosa*	-	72.88	89	95	8.29	0.91	-	-	0.69	13.13	1.36	-	-	-	-	0.42
81. *Black Jack Cooked With Groundnuts *Bidens Pilosa*	-	70	151	190	8.94	11.4	-	-	0.38	3.96	0.76	-	-	-	-	10.44
82. *Black Nightshade (Fresh) Solanum Nigram	-	80	63	93	4.74	0.74	-	-	0.44	0.16	0.01	-	-	-	-	181.04
83. *Blackjack Leaves	-	84	60	3.63	4.9	0.7	8.6	2.4	220	54.6	0.97	900	-	-	-	98
84. Busefwe Mushrooms (Brown, Large) Dry	-	-	306	-	17.0	3.4	51.8	-6.8	34	25.9	-	20	-	0.9	1.2	-
85. Busefwe Mushrooms (Brown, Large) Raw	-	86.8	45	-	2.5	0.5	7.6	1	5	3.8	-	17	-	0.9	1	-

- *means missing or undetermined value*
* *New analysed addition*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
86. *Cabbage (Fresh) Boiled *Brassica Oleracea Var. Capitata*	-	91.08	30	37	2.75	0.15	-	-	0.14	0.36	0.02	-	-	-	-	18.34
87. Cabbage (Fresh) *Brassica Oleracea*	-	91	26	-	1.7	0.1	6	1.2	47	0.7	-	48	0.04	0.04	-	-
88. Cabbage (Fresh) Cooked With Groundnuts	-	78.95	104	126	6.03	7.55	-	-	0.22	0.92	0.34	-	-	-	-	0.87
89. Carrots *Daucus Carota*	-	90	33	-	1	0	7	0.8	40	0.7	-	900	0.05	0.05	0.5	-
90. Cassava Leaves *Manihot Esculentus*	-	72.5	112.6	4.84	8.6	1.9	15.3	4	348.8	11	0.06	33,000	0.25	0.6	2.4	1,219.72
91. *Cassava Leaves (Fresh) *Manihot Esculentus*	-	70	109	151	10.93	2.24	-	-	0.44	0.07	0.02	-	-	-	-	380.88
92. *Cassava Leaves (Fresh) Boiled *Manihot Esculentus*	37	85.32	54	75	4.88	1.24	-	-	0.4	3.69	0.49	-	-	-	-	0.25

- *means missing or undetermined value*
* *New analysed addition*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
93. *Cassava Leaves (Fresh) Cooked With Groundnuts *Manihot Esculentus*	-	81.1	91	110	4.69	6.78	-	-	0.4	1.55	0.65	-	-	-	-	60.4
94. Cat?s Whiskers (Fresh) *Gynandropsis Gynandra*	-	87	34	-	4.8	0.4	5.2	1.2	288	6	-	1,500	-	-	-	-
95. *Cat's Whiskers (Fresh) Boiled *Cleome Gynandra*	-	80	64	89	5.48	0.59	11.19	-	0.53	6.65	0.15	-	-	-	-	40.43
96. *Cat's Whiskers (Fresh) Cooked With Groundnut *Cleome Gynandra*	-	75.1	129	161	8.75	10.53	3.9	-	0.5	3.56	0.94	-	-	-	-	0.41
97. Chitondo Mushrooms (Red-Yellow) Dry	-	-	221	-	12.9	2.1	37.5	10.7	54	58.9	-	71	-	0.3	1.8	-
98. Chitondo Mushrooms (Red-Yellow) Raw	-	91.6	-21	-	1.2	0.2	-3.5	-1	-5	55	-	39	-	0.2	1	-

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FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
99. Cowpea Leaves (fresh) Cooked with Groundnuts	-	68.58	145	183	8.67	9.86	-	-	0.55	7.74	0.14	-	-	-	0	-
100. *Cowpea Leaves (Dry) Cooked With Groundnuts *Vigna Unguiculata*	-	71.29	147	180	13.2	11.75	-	-	1.8	2.23	0.5	-	-	-	-	-
101. *Cowpea Leaves Fresh Boiled *Vigna Unguiculata*	-	92.15	22	32	2.21	0.36	-	-	0.2	5.72	0.04	-	-	-	-	16.88
102. Cowpea Leaves (Fresh) *Vigna Unguiculata*	-	86	54	-	4.6	0.8	7.2	1.7	346	0.2	-	726	-	-	-	142
103. Cucumber *Cucurbita Spp*	-	96	12	-	0.6	0	2	0.5	15	0.3	-	0	0.04	0.02	0.2	-
104. *Cucurbita Pepo*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
105. Fresh Green Peppers *Capsium Spp*	-	90	37	-	2	0.5	6	1	20	1	-	120	0.06	0.08	1	150

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FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
106. *Garden Eggs (Fresh) Boiled *Solanum Macrocarpon*	-	89.56	37	44	1.44	0.53	-	-	0.22	0.52	0.21	-	-	-	-	0.27
107. *Garden Eggs (Fresh) Cooked With Groundnuts *Solanum Macrocarpon*	-	82.45	82	124	3.76	5.27	-	-	0.24	0.51	0.15	-	-	-	-	29.95
108. *Garden Eggs (Fresh) *Solanum Macrocarpon*	-	93	24	30	0.94	0.22	-	-	0.04	0.01	-	-	-	-	-	11.11
109. Garden Eggs *Solanum Melongena*	-	93	22	-	1	0	4	1	10	1	-	0	0.05	0.03	0.8	5
110. Gourds *Lagenorie Vulgaris*	-	92	28	-	0.7	0	3. 0	0.3	20	0.6	-	0	0.04	0.03	0.6	-
111. Green Beans and Peas (Pods and Seed)	-	90	34	-	2	0	6	1	50	1.4	-	180	0.08	0.12	0.5	20

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FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
112. Green Beans and Peas (Seed Only)	-	70	104	-	7	0	19	2.5	40	2	-	45	0.3	0.15	1.5	25
113. *Sindambi Dry, raw *Hibiscus Meeusei*	-	6.32	3.20	4.06	19.68	3.49	-	-	2.04	0.37	0.06	-	-	-	-	250.44
114. Jute Leaves (Dry) *Corchorus Olitorius*	-	72.78	131	160	6.44	9.61	-	-	0.33	4.18	0.12	-	-	-	-	54.22
115. Jute Leaves (Fresh)	-	20.2	236	-	19	1.6	50.1	-	1,540	8	-	0	-	-	0.5	-
116. Kabansa Mushrooms (Brown & Small) Raw	-	87.4	41	-	1.8	0.2	7.9	1	5	4.9	-	15	-	0.9	1	-
117. Kabansa Mushrooms (Brown, Small) Dry	-	-	290	-	12.9	1.4	56.4	7.1	36	35	-	18	-	0.9	1.2	-
118. Lettuce (Fresh) Lactusa Sativa	-	94	20	-	1.2	0.2	4.3	0.6	26	0.7	-	90	0.1	0.1	-	-

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FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
119. *Lumanda Leaves (Fresh) Boiled	-	75.82	85	110	13.82	1.42	-	-	0.55	21.1	0.01	-	-	-	-	28.93
120. Lumanda Leaves *Hibiscus*		83	66	-	2.6	0.6	12.7	1.1	159	3.5		464	-	-	-	89
121. *Lumanda Leaves (Fresh) Cooked With Groundnuts *Hibiscus Meeusei*	-	71.08	141	175	6.49	11.17	-	-	0.36	1.72	0.62	-	-	-	-	0.29
122. *Wild Delele-Tindingoma or Lusakasaka (Dry) Cooked with Groundnuts	-	72.85	131	160	6.44	9.61	-	-	0.33	4.18	0.12	-	-	-	-	54
123. *Makowa (Dry) Cooked With Groundnuts *Cucurbita Spp*	-	67	144	167	6.99	8.58	-	-	0.29	2.78	0.92	-	-	-	-	45.23
124. *Moringa (Fresh) Boiled *Moringa Oleifera*	-	75	89	101	10.05	1.59	-	-	0.51	3.52	0.45	-	-	-	-	1.44

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FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
125. *Moringa (Fresh) *Moringa Oleifera*	-	75	86	98	10.05	1.4	-	-	0.6	3.68	0.39	-	-	-	-	0.91
126. *Mushroom From Wood (Dry) Boiled *Schizopyllum Commune*	-	60.25	127	145	4.36	0.1	-	-	0.37	3.34	1.76	-	-	-	-	85
127. *Mushroom From Wood (Dry) Cooked With Groundnuts *Schizopyllum Commune*	-	61.78	124	143	7.66	0.6	-	-	1.2	5.78	3.45	-	-	-	-	2
128. *Mushroom From Wood (Dry) *Schizopyllum Commune*	-	11.53	308	370	13.78	2.07	-	-	0.75	0.71	0.06	-	-	-	-	84.83
129. Mushrooms *Agancus Campestris*	-	90	11	-	2	0.3	-	1	5	1.2	-	-	0.02	0.4	1	-
130. Mushrooms (Dry)	-	10	99	-	18	3	-	9	50	12	-	-	0.35	0.6	8	-

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FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
131. * Mushrooms, Zondwe (fresh, raw)	-	60	136	204	9.01	1.54	-	-	0.12	0.28	0.01	-	-	-	-	90
132. Okra (Dry) Lady?s Finger	-	-	283	-	10.8	1.2	50.7	18.4	825	26.3	-	24	-	0.81	5.4	20
133. *Okra (Lady?s Fingers) (Dry) Cooked With Groundnuts *Hibiscus Esculentus*	-	80	87	103	3.42	7.8	-	-	1.3	0.77	2.25	-	-	-	-	9.91
134. *Okra (Lady?s Fingers) (Fresh) Boiled With Soda *Hibiscus Esculentus*	-	92.13	22	25	1.55	0.14	-	-	0.11	1.22	0.32	-	-	-	-	-
135. *Okra (Lady?s Fingers) (Fresh) Cooked With Groundnuts *Hibiscus Esculentus*	10	89.23	49	54	2.55	3.51	-	-	0.51	1.03	0.05	-	-	-	-	0.16

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FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
136. Okra (Lady?s Fingers (Fresh) *Hibiscus*	16	-	36	-	2.1	0.2	6.5	1.7	84	1.2	-	9	-	0.06	0.6	47
137. Okra Leaves (Fresh) *Hibiscus*	16	82	56	-	4.4	0.6	11.3	2.1	532	0.7	-	195	0.25	2.8	-	-
138. Onions, Large *Allium Copa*	-	87	48	-	1.5	0	11	0.5	30	0.5	-	0	0.04	0.02	0.3	-
139. Onions, Spring (With Greentops) *Allium Fistulosum*	2	90	36	-	1.8	0	8	1	50	1	-	600	0.5	0.05	0.4	-
140. Peppers (Dry Red)	25	13	321	-	12.9	9.1	59	26.2	130	7.8	-	450	0.23	1.33	0.5	2
141. Peppers (Fresh Red)	25	90	37	-	2	0.5	6	1	20	1	-	600	0.06	0.08	1	150
142. Pumpkin Leaves (Dry)	55	19	220	-	34.5	2.4	32.4	-	1,100	20.5	-	-	-	-	-	-
143. Pumpkin (Pale Flesh) *Cucurbita Pepe*	30	90	36	-	1	0	8	0.5	20	0.8	-	300	0.05	0.05	0.5	15

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	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
144. Pumpkin Leaves *Cucurbita Pepe*	13	85.4	53.8	-	4.7	0.5	4.4	2.3	284	16.8	-	1,800	-	0.06	-	-
145. *Pumpkin Leaves (Fresh) Boiled	-	85	48	67	3.23	0.47	-	-	0.46	5.6	0.12	-	-	-	-	10.32
146. *Pumpkin Leaves (Fresh) *Cucurbita Pepo*	-	85	45	60	3.8	0.4	-	-	0.62	7.18	0.1	-	-	-	-	39.33
147. *Pumpkin Leaves (Dry) Cooked With Groundnuts *Cucurbita Pepo*	-	70.83	137	181	8	9.58	-	-	0.49	4.62	0.14	-	-	-	-	28.82
148. *Pumpkin Leaves (Fresh) Cooked With Groundnuts *Cucurbita Pepo*	-	76.58	119	145	6.32	9.57	-	-	0.4	1.88	0.78	-	-	-	-	19.19
149. Pumpkin Yellow Flesh	-	90	36	-	1	0	8	0.5	20	0.8	-	1,800	0.05	0.05	0.5	15
150. *Pupwe (Dry) Boiled With Soda *Zanthoxylum Chalybeum*	-	93.16	21	24	11.2	0.2	-	-	0.21	2.25	0.02	-	-	-	-	10.25

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FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
151. *Pupwe (Dry) *Zanthoxylum Chalybeum*	-	7.88	308	459	11.37	2.1	-	-	1.19	0.08	-	-	-	-	-	533.18
152. *Rape (Fresh) Boiled *Brassica Carinata*	5	75.81	78	110	6.76	0.99	-	-	0.61	5.53	0.13	-	-	-	-	49.37
153. *Rape (Fresh) Boiled *Brassica Napus*	10	75	70	99	6.42	1.01	-	-	0.79	4	0.24	-	-	-	-	0.63
154. *Rape (Fresh) Cooked With Groundnuts *(Brassica Carinata)*	30	76.37	116	135	6.99	9.03	-	-	0.31	1.25	0.43	-	-	-	-	0.27
155. *Rape (Fresh) Cooked With Groundnuts *Brassica Napus*	25	78.9	98	125	6.33	7.16	-	-	0.7	1.4	0.33	-	-	-	-	0.42
156. Rape Leaves (Fresh *Brassica Rape*	-	93	27	-	2.7	0	4	3	100	3	-	3,000	0.1	0.3	0.8	12
157. *Sesamum Leaves (Fresh) *Ceratotheca Sesamoides*	-	80	65	83	5.25	0.45	-	-	0.63	16.69	0.11	-	-	-	-	59.25

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FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
158. *Sichikwele Mushroom (Fresh) *Lactarius Spp (Russulaceae)*	-	86	47	69	3.65	0.81	-	-	0.22	0.04	-	-	-	-	-	20.36
159. Sindambi (Dry) *Hibiscus Meeusei*	-	6.32	320	406	19.68	3.49	-	-	2.04	0.37	0.06	-	-	-	-	250.4
160. *Sindambi (Dry) Boiled *Hibiscus Meeusei*	-	75	83	108	7.2	-	-	-	0.51	7.73	0.11	-	-	-	-	21.31
161. *Sindambi (Dry) Cooked With Groundnuts *Hibiscus Meeusei*	-	78.35	104	124	4.74	7.67	-	-	0.28	3.05	0.5	-	-	-	-	1.02
162. Sweet Potato Leaves (Fresh) *Ipomoea Batatas*	-	77	72.2	-	3.4	0.8	12.9	1.9	422	7.5	-	3,838	0.1	0.28	0.9	122
163. *Sweet Potato Leaves (Fresh) boiled *Ipomoea Batatas*	-	61.61	125	166	8.53	1.75	-	-	1.34	31.67	0.16	-	-	-	-	65.16

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FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	**Moisture g**	**Food Energy (ME) cal**	**Gross Energy (GE) cal**	**Protein g**	**Fat g**	**(None fiber) Carbohydrate g**	**Fiber g (crude)**	**Calcium mg**	**Iron mg**	**Zinc mg**	**Vitamin A ug**	**Thiamine mg**	**Riboflavin ug**	**Nicotine Acid mg**	**Vitamin C mg**
164. *Sweet Potato Leaves (Fresh) Cooked With Groundnuts *Ipomoea Batatas*	-	89.34	51	61	2.86	3.79	-	-	0.17	1.64	0.16	-	-	-	-	0.21
165. Swiss Chard *Beta Vulgaris*	-	91	30	-	2.4	0.3	4.6	0.8	88	3.2	-	1,950	0.6	0.17	0.5	32
166. Tente Mushrooms (White Large) Dry	-	11.9	284	-	10.7	1.9	55.9	9	50	5	-	21.9	-	0.7	8	-
167. Tente Mushrooms (White Large) Raw	-	53.2	-20	-	1.1	0.1	3.6	1	33	5	-	0.12	-	1	-	-
168. *Termite Mushroom (Dry) *Termitomyces Spp*	-	9.7	302	439	30.59	2.78	-	-	0.72	0.06	0.04	-	-	-	-	169.6
169. Tomato *Lycopersicum Esculantum*	-	94	20	-	1	0	4	0.6	5	0.4	-	240	0.06	0.04	0.7	25

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FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
170. Wild Spinach (Fresh) *Amaranthus Spp*	-	80	54.4	-	4.7	0.5	8.3	1.8	498	26.7	-	7,868	0.05	0.42	-	-
171. *Zondwe Mushroom (Fresh)	-	60	136	204	9.01	1.54	-	-	0.12	0.28	0.01	-	-	-	-	90.02
172. *Zondwe Mushroom (Fresh) Boiled	-	52.42	166	189	9.78	1.65	-	-	0.43	4.72	1.54	-	-	-	-	-
173. *Zondwe Mushroom (Fresh) Cooked With Groundnuts	-	54.41	202	232	8.74	11.64	-	-	0.42	2.67	1.37	-	-	-	-	-
174. *Zumba (Dry)	-	5.37	331	474	24.69	3.23	-	-	1.55	49.7	0.42	-	-	-	-	231.82
175. *Zumba (Dry) Cooked With Groundnuts	30	77.91	102	136	6.39	7.59	-	-	0.24	0.97	0.46	-	-	-	-	231.82

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	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
V. FRUITS																
176. Apple *Pyrus Malus*	40	84	61	-	0.3	0.4	14	1	4	0.3	-	6	0.04	0.02	5	-
177. Avocado Pear *Persea Americans*	30	75	165	-	1.5	15	6	1.5	10	1	-	60	0.07	0.15	15	-
178. Banana *Musa Sapientia*	34	70	116	-	1	0.3	21	0.3	7	0.5	-	30	0.06	0.45	0.7	10
179. Baobab *Adansia Digitata*		16	290	-	2.2	0.8	6.7	6.8	284	7.4	-	21	0.37	0.06	2.1	170
180. Bread Fruit *Actocorpus Communis*		70	113	-	1.5	0.4	26	1.3	25	1	-	0	0.1	0.06	1.2	-
181. Grape (Wild) *Lannea Edulis*	16	70	23	-	1	-	4.7	-	-	-	-	-	-	-	-	14

- *means missing or undetermined value*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
182. Grape Fruit Citrus	5	90	37	-	0.5	0	9	0.3	20	0.5	-	0	0.04	0.01	40	-
183. Grapes *Vilitis Vicicolor*	33	80	75	-	1	0	18	0.5	20	0.3	-	15	0.04	0.02	5	-
184. Guava *Psidium Spp*	60	80	58	-	1.01	0.4	13	5.5	15	1	-	60	0.03	0	1	200
185. Jack Fruit	20	72	-	-	1.3	0.3	25.4	1	22	-	-	-	0.03	-	0.4	8
186. Julube *Zizyphus Spp*	60	83	63	-	1.8	0	14	0.6	25	0.8	-	0	0.02	0.04	0.9	65
187. Lemons, Limes Citrus	-	90	36	-	0.7	0	8	0.5	22	3.1	-	0	0.05	0	40	346
188. Loquat *Uapaca Sp*	70	86	-	-	0.4	0.2	12.4	0.5	20	0.4	-	201	-	-	-	100
189. Mango	72	83	63	-	0.5	0	18	0.8	10	0.5		180	0.03	0.04	30	-

- *means missing or undetermined value*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
190. *Mango (Raw, Ripe) *Mangifera Indica*	51	80	70	79	1.13	0.17	-	-	0.4	0.53	0.22	-	-	-	-	54
191. *Mango (Ripe) Boiled *Mangifera Indica*	7	80	70	79	0.46	0.17	-	-	0.18	0.52	0	-	-	-	-	9.26
192. *Masau (Fresh) *Ziziphus Mauritania*	-	80	68	-	1.37	0.3	-	-	0.25	3.27	0.01	-	-	-	-	58.69
193. Masula Plum *Sclerocaroa Spp*	68	87	34	-	5	-	8	-	-	-	-	-	-	-	-	180
194. Mobola Plum *Parmerium Spp*	50	70	13	-	1.01	-	-	-	-	-	-	-	-	-	-	64
195. *Mubula (Fresh Pulp) *Parinari Curatellifolia*	23	80	70	83	1.38	0.25	-	-	0.28	2.62	-	0.02	-	-	-	31.93
196. Mulberry	-	85	60	-	1.5	0	14	-	35	1.5	-	-	-	-	-	-
197. *Muzauli	-	5.72	486	625	12.09	35.07	-	-	1.29	13.7	0.09	-	-	-	-	48.29

- *means missing or undetermined value*
* *New analysed addition*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
198. *Ngai (Dry)	-	3.54	324	462	3.94	0.51	-	-	1.32	0.64	0.04	-	-	-	-	302.94
199. Orange *Citrus Sinensis*	-	86	53	-	0.8	0	13	0.3	30	0.5	-	9	0.08	0.03	45	70
200. Orange Wild *Strychros Spp*	-	80	64	-	1	-	15	-	-	-	-	-	-	-	-	1
201. Pawpaw *Carica Papaya*	-	89	-	-	-	0	-	-	20	0.5	-	300	0.03	0.03	50	-
202. Pineapple *Ananas Camosus*	-	85	57	-	0.4	0	1	0.5	20	0.5	-	30	0.08	0	30	-
203. Sour Plum *Ximenia Spp*	-	66	-	-	1	-	-	-	-	-	-	-	-	-	-	49
204. Water Melon *Citrullus Vulgaris*	-	92	29	-	0.5	0.2	6.4	0.3	7	0.5	-	177	0.03	0.2	0.2	7

- *means missing or undetermined value*
* *New analysed addition*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
VI. FISH																
205. Barbel, Barbus Spp	-	81	81	-	16	1.9	0	-	50	2	-	0	0.03	0.05	1.5	-
206. Bream Smoked	0	15	382	-	67	12.7	0	-	-	6	-	-	0.08	0.61	5.8	-
207. Bream, Fresh *Tilapia Spp* and *Serranochronis Spp*	0	80	91	-	17	2.6	0	-	50	2	-	0	0.03	0.05	1.5	-
208. Cat Fish Dry	-	21	307	-	62.5	6.3	-	-	1,400	3.5	-	0	0.1	0.17	5	-
209. Cat Fish, Fresh *Clarias Synodontis*	-	80	85	-	17.6	1.6	0	-	60	1.5	-	0	0.03	0.05	1.5	-
210. Kapenta Dry	0	20	209	-	63	6.3	0	-	3,000	8.5	-	540	0.1	0.2	6	-
211. Kapenta Fresh *Limnothrissa & Stolothrissa*	-	80	85	-	16	2	0	-	750	2.1	-	2,100	0.03	0.05	1.5	-

- *means missing or undetermined value*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
212. Mud Sucker *Labeo Congorum*	-	78	91	-	19	1.7	0	-	50	2	-	0	0.03	0.05	1.5	-
213. Sardines, Tinned *Sardinella Spp*	-	50	309	-	20	25	1	-	400	3	-	60	0	0.2	4	-
214. Striped Tail *Alestes Latelaris*	-	76.5	98	-	21	0.9	0	0	-	-	-	120	-	-	-	-
215. Striped Tail Robber, Dry	23	7.1	39	-	77.7	7.5	0	0	1,070	51	-	-	-	-	-	-
216. Tiger Fish *Hydrocyon Spp*	-	77	90	-	20	1.1	0	-	50	2	-	0	0.03	0.05	1.5	-
VII. MEAT, POULTRY & GAME																
217. Antelope	18	60	141	-	30.4	2.2	0	0	65	2.1	-	0	0.07	0.28	7.8	0
218. Beef, Corned	0	59	227	-	23	15	0	-	15	4	-	0	0	0.2	3.5	0

- *means missing or undetermined value*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
219. Beef, Lean	33	66	202	-	19	14	0	0	10	3	-	0	0.1	0.2	5	0
220. Beef, Moderately Fat (Minced)	18	-	262	-	16	22	0	0	10	2.5	-	0	-	0.15	4.5	0
221. Goat	-	73	145	-	16	9.6	0	0	11	2.5	-	0	0.3	0.05	5	0
222. Hippopotamus Smoked	70	20	385	-	63.1	12.8	0	0	-	-	-	-	-	-	-	-
223. Hippopotamus-Dry	0	13.3	368	-	80.6	2.6	0	0	3	9.1	-	0	0.04	24	4.5	0
224. Kidney	0	75	127	-	16	7	0	0	10	10	-	-	0.3	2	7	12
225. Liver (Average)	0	70	136	-	20	4	5	0	10	10	-	6,000	0.3	2	7	12
226. Mutton, Lean	-	73	149	-	17	9	0	0	11	2.5	-	0	0.2	0.25	5	0
227. Pork, Lean	-	50	371	-	14	35	0	0	10	2	-	0	0.8	0.2	4	0

- *means missing or undetermined value*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
228. Poultry Chicken		73	139	-	19	7	0	-	15	1.5	-	0	0.1	0.15	9	0
229. Rabbit		72	134	-	20	6	0	0	15	1.5	-	0	0.05	0.1	9	0
230. Tripe	0	79	94	-	19	2	0	0	130	1.6	-	0	0.08	0.15	1.6	0
231. Turtle	0	80	79	-	16	1	0	0	100	1	-	0	0.3	2.5	13	30
VIII. INSECTS																
232. Caterpillars, Fresh	-	81	86	-	10.6	2.7	4.2	0	19	0.5	-	0	0.15	0.2	0.1	-
233. *Caterpillars Green (Dry)	-	4.45	424	582	57.46	21.71	-	-	0.52	75.12	1.62	-	-	-	-	-
234. *Caterpillars; Masese (Dry)	-	7.18	396	548	47.9	17.85	-	-	0.83	0.06	0.07	76.75	-	-	-	76.75
235. *Caterpillars Big Green (Dry)	-	6.46	362	506	56.7	12.12	-	-	1.57	75.12	1.62	-	-	-	-	-

- *means missing or undetermined value*
* *New analysed addition*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
236. *Caterpillars Big Green (Dry) Boiled	-	34.88	261	360	37.36	9.68	-	-	0.69	17.48	0.8	-	-	-	-	-
237. *Caterpillars Big Green (Dry) Cooked With Groundnuts	-	50.54	234	302	19.15	15.38	-	-	0.52	5.88	3.21	-	-	-	-	-
238. *Caterpillars Tunkubi (Dry)	-	4.6	427	574	49.17	22.53	-	-	0.56	-	-	-	-	-	-	2.1
239. Caterpillars, Dry	-	8	372	-	55	13.8	7	0	270	20	-	0	0.35	2	11.2	-
240. Crickets	-	76	117	-	13.7	5.3	2.9	2.9	18	15	-	-	-	-	-	-
241. Grasshoppers, Raw	-	63	163	-	26.8	3.8	5.5	0	40	11	-	0	-	-	-	-
242. Termites, Fried	12	13	713	-	31.8	42.6	5.8	0	80	13.6	-	-	0.1	1.28	8.3	-
243. Termites, Raw	-	44	130	-	20.4	28	4.2	0	-	-	-	0	-	-	-	-

- *means missing or undetermined value*
* *New analysed addition*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
IX. EGGS																
244. Eggs	-	74	158	-	13	11.5	0.5	0	55	2.8	-	300	0.12	0.35	0.1	-
X. MILK & MILK PRODUCTS																
245. Cheese, Cheddar	-	37	423	-	25.4	34.5	0	-	810	0.57	-	420	0.04	0.5	0.1	0
246. Cow And Gate (Baby Milk Formula	4	-	507		14.5	26.5	52.7	-	500	5	-	795	-	0.81	6	42
247. Cow Whole	-	74	140	-	7	8	10	-	260	0.2	-	96	0.06	0.32	0.21	-
248. Cow Whole Condensed (Sweetened)	-	29	317	-	7.3	8	53.9	-	270	0.2	-	105	0.09	0.33	0.2	-
249. Cow, Skimmed Powder	-	4	557	-	36	1	51	-	1260	1	-	12	0.45	1.53	1.1	-

\- *means missing or undetermined value*

* *New analysed addition*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
250. Cow, Whole Fresh	-	88	64	-	3.3	3.6	4.7	-	120	0.1	-	45	0.04	0.15	0.1	-
251. Cow, Whole Powder	-	4	500	-	25.5	27.5	37.5	-	900	0.8	-	360	0.3	1.15	0.76	-
252. Formula S-26	-	-	570	-	12.5	30	-	0	370	10.6	-	661	-	0.92	8.3	48
253. Goat Milk	-	84	85	-	3.4	4.9	7	-	-	-	-	-	-	-	-	1
254. Human Milk	-	87	70	-	1.07	4.2	7.4	0	35	0.08	-	60	-	0.03	0.62	-
255. Lactogen	-	-	405	-	16.1	24.2	53.1	-	570	6	-	450	-	0.7	3.9	40
XI. SUGAR																
256. Sugar	-	0	400	-	0	0	100	-	0	0	-	0	0	0	0	0

- *means missing or undetermined value*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
XII. OILS AND FATS																
257. Butter	-	14	800	-	0.4	85	0	-	15	0	-	900	0	0	0	0
258. Cheese	-	8	820	-	0	92	0	-	0	-	-	(225-1,080)	0	0	0	0
259. Lard		1	891	-	0	99	0	-	0	0	-	600	0	0	0	0
260. Margarine	-	14	765	-	0	85	0	-	4	0	-	0	0	0	0	0
261. Red Palm Oil	-	0	900	-	0	100	0	0	0	0.2	-	1050	0	0	0	0
262. Vegetable Oil	-	0	900	-	0	100	0	0	0	0	-	6,000	0	0	0	0
XII. BEVERAGES																
263. Chibuku Beer	-	95.5	13	-	0.4	0.2	3.9	0.1	-	-	-	-	-	-	-	2.5
264. Mango Juice	-	-	52	-	0.3	0.4	15.7	0.2	-2.4	-1.2	-	-3,200	-	0.03	0.2	(42) 50

- *means missing or undetermined value*

FOOD AND DESCRIPTION / LATIN NAME	COMPOSITION PER 100 GRAMS EDIBLE PORTION															
	Waste % A. P.	Moisture g	Food Energy (ME) cal	Gross Energy (GE) cal	Protein g	Fat g	(None fiber) Carbohydrate g	Fiber g (crude)	Calcium mg	Iron mg	Zinc mg	Vitamin A ug	Thiamine mg	Riboflavin ug	Nicotine Acid mg	Vitamin C mg
265. Orange Juice	-	-	44	-	0.8	0.4	10.5	-	11	0.2	-	20	-	0.03	0.4	-
266. Alcoholic Munkoyo	-	93	28.9	-	0.6	0.9	4.6	0.1	4.7	-	-	-	-	-	-	-
267. Non-Alcoholic Munkoyo	-	88.6	61.9	-	0.7	1.1	12.3	0.2	3.7	-	-	-	-	-	-	-
268. Opaque Maize Beer, Seven Days	-	93.2	23.6	-	0.9	0.4	4.1	0.4	19	8.9	-	-	-	-	-	-
XIII. MISCELLANEAOUS																
269. Frogs	-	82	73	-	16.4	0.3	0	0	18	1.5	-	0	0.14	0.25	1.2	0
270. Snails	-	78	82	-	12	2	4	0	1,500	8	-	0	0	0.05	1.3	0
271. Sorghum & Maize Stems	-	75	58	-	0.5	0	14	-	25	1	-	0	0	0	0	0
272. Sugar Cane Saccharum	-	82	60	-	1	0	14	2.1	10	1	-	0	0.02	0.2	0.1	0

* New entry determined foodstuff

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Appendices

Appendix 1: List of common, scientific and local names of foods

Key of Abbreviations of Languages: B - Bemba; K - Kaonde; Le - Lenje; Lo - Lozi; Lu - Lunda; N - Nyanja; T - Tonga; Tum - Tumbuka; Lv - Luvale

COMMON NAME	SCIENTIFIC NAME	VERNACULAR NAMES
African egg plant	*Solanum aethiopicum L* *Solanum macrocarpon L*	**Impwa** (B, K, T, Tum, N)
African polony Orchid roots	*Disa spp.* *Satyra siva*	**Chikanda** (B, Le, T, N);
African red-capped Chanterelle	*Cantharellus longisporus* Heinem	Kasweta (Tum; Manyame (N); **Chitondo** (B); Bakapyupyu (T)
Avocado	*Persea americana* Mill	**Kotapela** (T, N, L, B)
Bambara nuts	*Vigna subterannea (*L) Verdc	Intoyo, Ubuleya (B); Mbwila, Katoyo (K, Le); Matuhu, Lituhu (Lo); **Ntoyo**, Kandundwe, Mbwila, Mbwiila (T); Zyama (Tum), Nzama (N).
Banana	*Musa sapientum* L	Babbanana, Mabanana (T); Inkonde (B); Makhombwe (Tum); **Makonde** (L); Nthochi (N)
Baobab	*Adansonia digitata* L	**Mabuyu** (Tum, Le, T); Mukulukumbwa, Muuyu (N). Mubuyu (Lo)
Beans	*Phaseolus vulgaris* L.	Seeds: Cilemba, **Chilemba** (B), Chilemba, Nkunde (K); Lunawa, Manawa (Lo); Nchunga (Tum); Kayela (N); Makunde (Lv) Leaves: Chimpapila, Cimpapila, Citapasha, Cinkamba (B);
Black jack	*Bidens Pilosa* L.	Kanunka, Kasokopyo (B); **Kanuka**, Kanzoto (N); Kanunka, Munkulwe, Phupu (T); Chisoskono (Tum); Sisandulwa (Lo)
Black nightshade	*Solanum nigram* L	Indulwe (B); Ndulweti, Kwila (Lo); Musaka (Tum); **Ndulwe** (N, T); Ndululu (T).
Cabbage	*Brassica oleracea* L. *var. capitata*	**Khabichi** (N); Kabeki (B).
Cabbage tree	*Moringa oleifera L*	**Muzakalande**, Zakalanda, Mutiligadi (T)

Carrot	*Daucus carota L.*	**Kaloti** (N, Tum); Kalutu, Khalutu; Kalota (B).
Cassava	*Manihot esculenta* Crantz.	Roots: Mwanja (Lo, T); **Tute** (B); Chikhau, Cicawa, Mayawo (Tum); Chinangwa (N), Makamba (K, Le, T); Mukamba (Lv). Leaves: Shombo (Lo); **Katapa** (B), Chigwada (Tum), Gwada (N); Chishu Chamakamba (Le); Matamba (K, Lv).
Charcoal burner	*Russula cyanoxantha* Ja. C. Schaeffer: Fries	**Busefwe**, Musefwe (B)
Chikolowa	*Termitomyces letesui* (Pat.) R. Heim	**Chikolowa,** Bungulungulu (B); Nyonzwe yaikulu (N); Bowa Ng?anda (T)
Chilli pepper	*Capsicum frutescens* L	Impilipili, (B); Longwe, **Mphiriphiri**, Tsabola (N); Mphilimphili (T), Ndungu (Lv.
Coco Yam	*Colocasia esculenta* (L.) Schott	Koko (B); Malumba, Lumuna (Lo); Masimbi (Tum).
Cowpeas	*Vigna unguiculata* (L.) Walp.	Seeds: Ilanda, **Nyangu**, Inyangu (B); Khunde, Nkunde (Tum); Manawa (Lo); Nyangu (K, Le, T); Nyemba (T, N); Leaves: Khwanya (Tum); Sampala, Mtambe, Mutambe (N); Sonsolo, **Kachesha**, Chinyangwale, Citambe (B).
Finger millet	*Eleusine coracana* (L.)	Nzembwe, Lunku (T); **Mabele** (Le); Mauza (Lo); Amale, Amao (B); Mawele, Lupoko (N); Kambala Mkulu, Malezi, Kambala (Tum); Masangu (Lv).
Groundnuts	*Arachis hypogaea* L.	Shaba**, Nshawa**, Cawa (N); Nyemu, Nyimu (K); Nyemu (T, Le); Dongwe, Ndongwe (T); Imbalala (B); Ndongo (Lo), Byelu (Lv).
Guava	*Psidium guajava* L.	**Magwaba** (K, T, B); Amapela (B); Gwawa, Gwaba (N); Magwawa (Tum)
Indian plum Jujube plum	*Ziziphus mauritiana* Lam.	**Masau (**B, N); Masawu (T); Masawo (K).
Irish potato	*Solanum tuberosum* L.	Ifilashi, Batatishi, **Mbatata**, Imbofule (B); Mbatatishi (K); Imbatatisi, Magwili (T); Mbatatisi (N); Katofeni (Tum)

Jackfruit Breadfruit	*Artocarpus heterophyllus* (Thunb.) Merr	None recorded
Jew?s mallow	*Corchorus tridens* L.	Ntanda Nzovu (Tum); **Tindindingoma** Ndende, Kamunwe (N); Kamunwe, Lusakasaka (B)
Kabansa	*Lactarius kabansus* Pegler and Pierce	**Kabansa** (B); Kambowambowa, Chizamukupa (T); Nakandama (Lo).
Knob wood tree	*Fagara Chalybea* (Engl) Engl EX *Zanthoxylum chalybeum* Engl	**Pupwe** (K, T, Tum); Pupwe chulu (B)
Lemon	*Citrus limon* L.	**Mandimu** (Tum, N); Lemoni (T, Lo); Indimu (B).
Lettuce	*Lactuca Sativa* L.	Leteshi (B); **Letesi** (N); Maletusi (T).
Livingstone potato	*Plectranthus esculentus* N.E. Brown	Umumbu (B); **Mumbu** (K); Sikuswani (Lo); Njobela (Tum).
Lumanda	*Hibiscus meewsei* Exell.	**Lumanda** (K, Le, N, Tum, B), Katolo (Lv).
Maize	*Zea mays* L.	Vingoma, Ngoma (Tum); Vitonga, **Chimanga** (N); Mapopwe (T); Manchebele (Le), Chivwale (Lv)
Mango	Mangifera indica L.	**Manga** (N); Imyembe, Yembe (B), Mbuma (Lv).
Marula	*Sclerocarya birrea* (A. Rich) Hochst	Imionga, Umusepe (B); Ng'oongo, Ng'ongo, Mung'oongo (T); Masebe (Tum); Msebe, Msewe (N); Mungongo (Lo).
Mobola plum	*Parinari curatellifolia* Planch ex Benth	Imbula, **Mpundu** (T); Imbula (Le); Mbula (T, Tum); Intalu, Intambwa, Mpundu, Impundu (B); Maula, Mphundu (N); Mubula, Mpundu (Lo)
Mungongo nut	*Schinziophyton rautinenii* (Schinz) Radcl,-Sm.	Makusu, Mahubi (Tum); Mkusu (N); **Mungongo** (Lo); Ntalu, Intalu (B)
Munkoyo	*Desmodium salicifolium (Poir.) DC*	Kelunge (K); Mkhoyo, Munkhoyo (N); Munkoyo (B, T); Munkhoyo, Suzyo (Tum) Mukhoyo (Lv).

Munkoyo	*Rhynchosia insignis* (O. Hoffm.) R. E. Fries	Chitondo (K); Munkoyo (B, N)
Oil Palm	*Elaeis guineensis* Jacq	Inkoma, Ingashi (B); **Chinkondya** (B, N)
Okra	*Hibiscus esculentus* L.	Delele wamakoto, Delele yamakoto (T, Le); Mudelele, Muudelele (T), **Delele** (K); Bindi, Chilunguntanda (B); Thelele yo bala (N)
Onion	*Allium cepa* L.	Hanyinsi, Hanyisi (T); Nyanisi (Lo) Kanyense (B); **Anyenzi** (N), Sapola (Lv).
Orange	*Citrus sinensis* L.	Mawolenji (Tum)
Pawpaw	*Carica papaya* L.	Papaya, **Popo**, Papayi (N); Papao, Amapapao, Ipapao, Popo, Popow (B); Mapopo, Mapoposi, Mappoopo (T); Mapopo (Lo)
Pigeon pea	*Cajanus cajan* (I.) Millsp	Mbange, Mpheni, M'pheni, Pheni (Tum) Ingolyolyo, Utuwoliwoli (B); Nyamundolo, Nyandolo (N)
Pineapple	*Ananas camosus* (L.) Merr.	Ifinanashi, Icinanashi, **Ichinanashi** (B); Chinanasi (N).
Pumpkin	*Cucurbita spp*	Fruit: Ifipushi (B); Matanga, Maungu (N). Chingulu (Lv). Leaves: **Chibwabwa** (B); Mkwani (N), Mangambwa (Lo). Seeds: Impupu, Mpomboolo, Mpoomboolo (T).
Rape	*Brassica napus* L.	**Lepu** (B, N)
Rhodesian copal wood	*Guibourtia coleosperma* (Benth.) J Leonard	**Muzauli,** Munzauli (Lo)
Rice	*Oryza sativa* L	Umupunga (B); Bulonto (Lo); Mmpunga (N); **Mupunga** (Tum), Loso (Lv).
Roselle	*Hibiscus mechowii* Garcke; *Hibiscus sabdariffa* L.	Sindambi (Lo); Chindambi (Lu); **Mundambi** (Lenje, Tonga).
Sesame	*Sesamum indica* L.	Ubwengo (B); **Bwengo** (K); Bwengo, Bweengo (T); Wengo (Tum)
Sesamum	*Ceratotheca sesamoides* Endl	Kalembwe katali, Kafulu (B); Lunembwe (Lo); **Katate** (N); lunkomba bwiengo (T)

Slender leaf rattlebox	*Crotolaria ochroleuca*	**Zumba** (Le, K, B, N, T); Chekwechekwe (Tum)
Small flower morning glory	*Jaquemontia* tamnifolia (L) Griseb	Siboyani, Busala (Lo), **Busala** (Le, Kaonde), Bwidi, Busala, Lusala (T); Busala, Busabo, Ubusala (B)
Sorghum	*Sorghum bicolor* (L) Moench	Amasaka (B); Maila (Le, T); Makonga, **Mabele** (Lo); Mayila (T); Kanchebele (Tum), Mapila (N).
Soybeans	*Glycine max* (L) Merr	**Soya** (B, Tum, N)
Sugarcane	*Saccharum officinarum* L	Ifisali (B); Muswati, Mushwati (Lo); Misale, **Nzimbe**, (N, T); Mujuba (Tum)
Sweet potato	*Ipomoea batatas* (L) Lam.	Tubers: Cimbwali, Imbata (T); Ngulu (Lo); Kandolo, Mboholi, Mpwete, Mpatata, (Tum); Ifyumbu, Kandolo (B); Kandolo (K, Le); Kachamba, **Kandolo,** Mbasi (N). Leaves: Bwaka (Tum), Kalembula, Kholowa, Kacala (N); Kalembula (K, T)
Tomato	*Lycopersicon esculentum* L.	Cimanti, **Matimati** (B); Maddombansya, Madede (T); Mutamangisi (Lo); Mapuno (Tum); Matimati, Cimate, Chimate (N).
Velvet beans	*Mucuna pruriens* L.	Chitedze, **Nkasi** (N); Mabingobingo (T)
Water melon	*Citrullus lanatus* (Thunb) Matsun and Nakai	Chitangamaji (Tum); Ifibikila (B); Mahapu (Lo); Mvewmba, Vwembe, Nthangamadzi, (N); Namunwa (T).
Yam	*Dioscorea spp*	**Chilungu** (Tum, K, Le); Bilungu (T); Filungu, Ifilungwa, Fikengere, Ifitu (B); Bilungwa (K); Chimbukuta (Tum); Mupama, Mpama, **Mphama** (N); Impama (K, T, Le)

Key

B	Bemba
K	Kaonde
L	Lenje
L	Lozi
N	Nyanja
T	Tonga
Tum	Tumbuka
Lv	Luvale

Appendix 2: Local names of some of the Foods used in the Food Composition Table for use in Zambia.

Aerial yams – *L-Makoto* 	**B - Amankolobwe** (***cucumis spp***.) 
Beans leaves ***(Phaseolus vulgaris)*** *N - Ntambe; T-Mponde; B - Chimpapila; L -K-Sampu, Lv - Mafo Amakunde* 	**Beans** (***Phaseolus vulgaris***) *T - Nyabo; N- B - Chilemba, Lv- Makunde* 
Avocado seed ***(Persea Americana)*** *T - Kotapela* 	**Baobab (*Adonsonia digitata)*** *T - B - K - L - Mabuyu; N - Mlambe; L - Muyu* 

Baobab seeds (*Adonsonia digitata)*

Baobab leaves (*Adansonia digitata)*

Cassava ***(Manihot Esculenta)*** *N - Chinagwa; T - Mwanja; B -Tute; L - Mwanja , Lv - Mukamba*

Cassava leaves (*Manihot Esculenta*) *N - Chigwande, Vikwanu; T - Matuvu a mwanja; B - Katapa; L - Shombo; Lv - Matamba*

Catswhiskers ***(Cleome gynadra)***
B - Lubanga; N - Suntha;T - Shungwa; L - sisungwa

Green Caterpillars *N -T - Hikubala; B ? Ifishimu; L - Masese, Lv - Mongu; K-Matamba*

Cow pea leaves (*Vigna unguiculata)*

Cowpeas **(Dube Vigna unguiculata)**
T-Nyangu; N - Nyemba; B - Inyangu; L- Manawa; K - Lwanda; Lv - Makunde Alanda

Cucumbers ***(Cucumis sativus)*** *N - Ubimbi; T - Makowa;B - Chibimbi; L- Malaka,* 	**Duck** *N - Mabata; K - Ibande; B- Imbata; L - Sibata, Lv - Phato* 
Finger Millet ***(Eleusine Africana)*** *N - Mawele T - Mabele; B - Male; Maila Lv - Masangu* 	**Fruit**, *T - Ngai* 
Gourd ***(leganania vulgaris)*** *N - Ntumwa; T - Linkulu; B - Myungu; L - Sihwama Lv - Lichipa* 	N - Ziphwete; Chitunguza; B - Citungusa Lv - Katende; T - Makwambala 
	**Green peas** *B - Ntongwe* 

Groundnuts Chalimbana/Makulu Red *(Arachis hypogaea)* *N - Nshaba; T - Nyemu; B - Mbalala; L - Ndongo; Lv - Vyelu*

Groundpea / Bambara nuts *T - Bulukutu Mbwila; B - Ntoyo; L - Kandundwe; N - Nzaama; L - Lituu, Lv - Vyelu bya Kaseke*

Happa Yam B - *Chama; T - Chipama*

Kalungwa Yam

Monkey Orange *(Strychnos ssp)* *T-Matamba Mabo; Lv - Makolo*

Maize (*Zea mays*) *N - Chimanga, T- Mapopwe B -Nyanje, Lv - Chivwale*

Loquat *(Uapaca kirkiana*) B - Masuku; T - Masuku; N - Masuku

Lusitu rice *N - Mupunga. T - Mupunga Lv - Loso*

Marula, Cider Tree ***(Sclerocarya birrea ssp)*** *T - Mungongo* 	**Mango** ***(Mangifera indica)*** *N - Mango; T - Mango; B - Mwembe; L - Mango, Lv - Mbuma* 
T - Mupama 	Mushroom from the wood **(*Lactarius spp (Russula*)** *N - T - B - Pampa; L - K - Busepa* 
L - Nakandama; B - kalansa; K - kamanse 	**Ndongo (***Bombard Mango)* 

(Ximenia americana) *B - Makola mfula; T - Nchovwa* 	**Mushroom** *L - Ndwindwi; K - Kachilechile; N - Chitondo Lv - Uhwa wa Kachilachila.* 
T - Nkolondo; N - Finfya; B - Intutu 	**Pawpaw** ***(Carica papaya)*** *– Papaya; T- Ipoposi; B - Amapapao; L - Simpubila* 
Pumpkin leaves ***(Cucumeropsis pepo)*** *B- Chibwabwa; T - Muchile Lv - Mafo a vingulu* 	**Pumpkin** ***(Cucumeropsis pepo)*** *N-Matanga; B - Chipushi; Lv- Chingulu T - Chitende* 
Orchid roots ***(Habonaria spp)*** **N –** *Chinaka; T - Chikanda; B - Chikanda; L - Mangende* 	**Okra** ***(ladies fingers) Hibiscus esculentus*** *B- Mulembwe; N - Delele; T - Ndelelewamakoto* 

Rape ***(Brassica carinata)*** *Brassica napus*
B - Lepu

Wild Orange (*Strychnos cocculoides)*
N - Mteme; T- Kasongo; T - Mawi;
B - Kasongole; L - Mahuluhulu

Wild spinach (*Amaranthuis spp)*
N - Bonongwe; T - Bbonko; B - Longalenga;
L - Libowa; L v- Lengalenga

Hibiscus meeusei ***(Sour Rosella)***
K - Sindambi; Lv - Mutete

Sorghum ssp *T - Maila; B - Amasaka; -*
N - Mapila; Lv - Masa

L - Sitongwani; L - Sibiti

B - Amateke

B - Kundu-kuwila

Nsanfye

Pumpkin flowers *B - Ubulongo*

Namulomo; L - Mupundu-pundu

Wild Yam - *Chaama*

Finger millet ***(Eleusine Coracana)***
T - N - Zembwe; B - Amale; L - Mabele
Lv - Masangu

Wild delele ***(Corchorus tridens)***
B - Lusakasaka, N,T-Tindingoma

Velvet beans *N- Nzama B- Sape*

Mushroom *K-Zondwe*

Appendix 3: Table 4. Determined Nutrient Composition (per 100g) of New Foodstuffs included in the Revised Food Composition Tables

Key of Abbreviations of Languages: B - Bemba; K - Kaonde; Le - Lenje; Lo - Lozi; N - Nyanja; T - Tonga; Tum - Tumbuka

Common Name	Local Name	Scientific Name	Condition	Cooking Method	Moisture g	ME cal	G.E. cal	Protein g	Fat g	Ash g	Calcium g	Iron mg	Zinc mg	Vit. C mg
Aerial yams	Makoto yams (L)	*Dioscorea spp*	Fresh	Raw	70	103	113	1.9	0.2	1.35	0.38	3.53	0.9	65.12
Amankolobwe	Amankolobwe	*Cucubitus*	Dried	Boiled	70	93	108	3.38	0.1	3.99	0.51	10.45	2.7	0.62
Amankolobwe	Amankolobwe	*Ccucubitus*	Dried	With groundnuts	73.29	119	137	5.23	8.04	3.41	0.37	6.41	0.51	0.34
Amankolobwe	Amankolobwe	*Ccucubitus*	Dried	Raw	6.77	286	330	22.2	5.32	19.46	2.01	86.38	2.58	3.56
Avocado seeds	Avocado seeds	*Persea americana*	Dried	Raw	10	324	390	5.17	2.94	2.62	0.92	3.54	0.7	14
Bean Dark Red	Chilemba (B)	*Phaseolus vulgaris*	Dried	Raw	8.97	316	477	21.87	1.55	4.24	0.72	0.35	0.01	76.75
Bean leaves	Chimpapila (B), Sampu (K)	*Phaseolus vulgaris*	Fresh	Raw	64	118	166	10.51	1.34	4.67	0.99	0.05	0.01	102.77
Bean leaves	Chimpapila (B)	*Phaseolus vulgaris*	Fresh	Boiled	92.56	24	33	5.17	0.3	0.96	0.26	4.55	0.03	12.4
Bean leaves	Chimpapila (B)	*Phaseolus vulgaris*	Fresh	With groundnuts	74.74	124	161	6.46	9.13	1.95	0.4	2.95	0.45	123.34
Beans	Kabulangeti beans	*Phaseolus vulgaris*	Dried	Raw	8.89	315	406	18.8	1.4	4.42	0.4	0.05	0.2	109.02

\- *means missing value*

Common Name	Local Name	Scientific Name	Condition	Cooking Method	Moisture g	ME cal	G.E. cal	Protein g	Fat g	Ash g	Calcium g	Iron mg	Zinc mg	Vit. C Mg
Beans	White beans	*Phaseolus vulgaris*	Dried	Raw	9.69	312	425	17.06	1.55	4.63	0.5	0.08	0.03	161.54
Black jack	Kanunka (B)	*Bidens pilosa*	Dried	Raw	6.72	316	363	30.01	3.25	8.46	2.08	76.2	0.97	193.2
Black jack	Kanunka (B)	*Bidens pilosa*	Dried	With Groundnuts	70	151	190	8.94	11.4	1.71	0.38	3.96	0.76	10.44
Black jack	Kanunka (B)	*Bidens pilosa*	Dried	Boiled	72.88	89	95	8.29	0.91	3.25	0.69	13.13	1.36	0.42
Black nightshade	Ndulwe, Nkwila (B), Musebo (K), Nthuma (N), Ndulwe (T),	*Solanum nigram*	Fresh	Raw	80	63	93	4.74	0.74	3.19	0.44	0.16	0.01	181.04
Busala	Busala	*Dioscorea hirtiflora*	Fresh	Raw	55	318	3.58	4.15	0.22	2.22	0.4	8.87	0.42	0.59
Busala	Busala	*Dioscorea hirtiflora*	Fresh	Boiled	51.94	148	167	3.41	0.32	6.85	0.45	7,88	0.42	1.12
Busala	Busala	*Dioscorea hirtiflora*	Fresh	Groundnuts	48.01	229	261	9.13	13.35	4.44	0.5	5.08	1.64	2.45
Cabbage	Cabbage	*Brassica oleracea var. capitata*	Fresh	Boiled	91.08	30	37	2.75	0.15	0.65	0.14	0.36	0.02	18.34

\- *means missing value*

Common Name	Local Name	Scientific Name	Condition	Cooking Method	Moisture g	ME cal	G.E. cal	Protein g	Fat g	Ash g	Calcium g	Iron mg	Zinc mg	Vit. C Mg
Cassava leaves	Katapa (B), Matamba (K), Shombo (L)	*Manihot esculenta*	Fresh	Raw	70	109	151	10.93	2.24	2.29	0.44	0.07	0.02	380.88
Cassava leaves	Katapa (B), Matamba (K), Shombo (L)	*Manihot esculenta*	Fresh	Boiled	85.32	54	75	4.88	1.24	0.97	0.4	3.69	0.49	0.25
Cassava leaves	Katapa (B), Matamba (K), Shombo (L)	*Manihot esculenta*	Fresh	With groundnuts	81.1	91	110	4.69	6.78	1.73	0.4	1.55	0.65	
Caterpillars green	Finkubala (B), Vinkhuwala (N)		Dried	Raw	4.45	424	582	57.46	21.71	3.55	0.52	75.12	1.62	
Caterpillars	Ifishimu (B)Tunkubi (K)		Dried	Raw	4.6	427	574	49.17	22.53	3.62	0.56	-	-	2.1
Caterpillars	Masese (B)		Dried	Raw	7.18	396	548	47.9	17.85	3.80	0.83	0.06	0.07	76.75
Caterpillars Big green	Finkubala (B)		Dried	Raw	6.46	362	506	56.7	12.12	7.03	1.57	75.12	1.62	-
Caterpillars Big green	Ifishimu (B) Hikubala (T)		Dried	Boiled	34.88	261	360	37.36	9.68	3.94	0.69	17.48	0.8	-
Caterpillars Big green	Ifishimu (B) Hikubala (T)		Dried	With groundnuts	50.54	234	302	19.15	15.38	2.97	0.52	5.88	3.21	-
Catswhiskers	Lubanga (B), Suntha (N), Shungwa (T)	*Cleome gynadra*	Fresh	With groundnuts	75.1	129	161	8.75	10.53	1.72	0.5	3.56	0.94	0.41
Catswhiskers	Lubanga (B), Suntha (N), Shungwa (T)	*Cleome gynadra*	Fresh	Boiled	80	64	89	5.48	0.59	2.75	0.53	6.65	0.15	40.43

Cocoa yam	Cocoa yam	*Dioscorea spp.*	Fresh	Raw	70	106	125	1.1	0.51	0.86	0.72	0.63	0.31	0.39
Cow pea leaves	Kachesha (B)	*Vigna unguiculata*	Fresh	Boiled	92.15	22	32	2.21	0.26	1.92	0.2	5.72	0.04	16.88
Cowpea leaves	Kachesha (B)	*Vigna unguiculata*	Fresh	With groundnuts	68.58	145	183	8.67	9.86	2.88	0.55	7.74	0.14	0.47
Cowpea leaves	Kachesha (B)	*Vigna unguiculata*	Dried	With groundnuts	71.29	147	180	13.2	11.75	2.08	1.8	2.23	0.5	
Dried sour Rosella	Dried Sindambi boiled	*Hibiscus meeusei*	Dried	Boiled	75	83	108	7.2	-	1.65	0.51	7.73	0.11	21.31
Fruit	Ngai (T)	-	Dried	Raw	3.54	324	462	3.94	0.51	6.17	1.32	0.64	0.04	302.94
Garden eggs	Impwa (B)	*Solanum macrocarpon*	Fresh	Raw	93	24	30	0.94	0.22	0.46	0.04	0.01	-	11.11
Garden eggs	Impwa	*Solanum macrocarpon*	Fresh	With groundnuts	82.45	82	124	3.76	5.37	1.13	0.24	0.51	0.15	29.95
Garden eggs	Impwa	*Solanum macrocarpon*	Fresh	Boiled	89.56	37	44	1.44	0.53	0.57	0.22	0.52	0.21	0.27
Dried sour Rosella	Dried Sindambi boiled	*Hibiscus meeusei*	Dried	Boiled	75	83	108	7.2	-	1.65	0.51	7.73	0.11	21.31
Green gram		*Phaseolus aureus*	Dried	Raw	7.01	319	337	24.5	0.77	4.26	1.45	12.05	0.55	38.63
Groundnuts chalimbana	Mbalala (B), Nshaba (N), Ndongo (L)	*Arachis hypogaea*	Dried	Raw	5.99	502	645	27.1	39.65	2.56	1.13	4.39	2.46	-
Kasona yam	Kasona yam	*Dioscorea spp.*	Dried	Raw	70	102	120	1.72	0.2	1.38	0.52	0.59	0.37	0.79
Lumanda	Lumanda	*Hibiscus meeusei*	Fresh	With groundnuts	71.08	141	175	6.49	11.17	3.16	0.36	1.72	0.62	0.29

Lusitu Rice	Mupunga		Dried	Raw	10	309	377	6	1	4.47	1.1	20.87	0.56	100.8
Makowa	Makowa	*Cucurbita spp*	Dried	With groundnuts	67	144	167	6.99	8.58	3.27	0.29	2.78	0.92	45.23
Makulu red (groundnuts)	Mbalala (B), Nshaba (N), Ndongo (L)	*Arachis hypogaea*	Dried	Raw	4.12	547	792	25.2	48.11	2.32	1.06	11.1	0.46	57.65
Mango	Mango	*Mangifera indica*	Fresh	Boiled	80	70	79	0.46	0.17	0.45	0.18	0.52	0	9.26
Mango	Mango	*Mangifera indica*	Fresh	Raw	80	70	79	1.13	0.17	0.4	0.4	0.53	0.22	54
Masau	Masau	*Ziziphus mauritania*	Dried	Raw	80	68	-	1.37	0.3	1.01	0.25	3.27	0.01	58.69
Moringa	Moringa	*Moringa oleifera*	Fresh	Raw	75	86	98	10.05	1.4	2.59	0.6	3.68	0.39	0.91
Moringa	Moringa	*Moringa oleifera*	Fresh	Boiled	75	89	101	10.05	1.59	2.12	0.51	3.52	0.45	1.44
Mubula	Mubula (B) Mbula (T)	*Parinari curatellifolia*	Fresh	Raw	80	70	83	1.38	0.25	0.62	0.28	2.62	-	31.93
Mungongo nut	Mungongo		Dried	Raw	10	549	668	22.38	54.56	4.02	1.21	13.03	0.09	45.91
Mushroom	Banyime (K)	*Lactarius spp (Russulaceae)*	Dried	Raw	10.98	298	450	30.39	4.6	11.01	0.99	1.35	0.02	125.23
Mushroom	Sichikwele (L)	*Lactarius spp (Russulaceae)*	Dried	Raw	86	47	69	3.65	0.81	1.93	0.22	0.04	-	20.36
Mushroom	Zondwe (L)		Fresh	Raw	60	136	204	9.01	1.54	3.83	0.12	0.28	0.01	90.02
Mushroom from wood	Busepa (K), Pampa (B)	*Schizophyllum commune*	Dried	Raw	11.53	308	370	13.78	2.07	4.61	0.75	0.71	0.06	84.83

Mushroom from wood	Busepa (K), Pampa (B)	*Schizophyllum commune*	Dried	Boiled	60.25	127	145	4.36	0.1	4.11	0.37	3.34	1.76	85
Mushroom from wood	Busepa (K), Pampa (B)	*Schizophyllum commune*	Dried	With groundnuts	61.78	124	143	7.66	0.6	3.28	1.2	5.78	3.45	2
Muzauli	Muzauli		Dried	Raw	5.72	486	625	12.09	35.07	1.51	1.29	13.7	0.09	48.29
Njamva yam	Njamva yam	*Dioscorea spp.*	Dried	Raw	70	101	119	3.22	0.2	1.50	0.62	1.26	0.54	0.56
Okra	Mulembwe (B), Delele (N)	*Hibiscus esculentus*	Dried	With groundnuts	80	87	103	3.42	7.8	5.40	1.3	0.77	2.25	9.91
Okra	Mulembwe (B), Delele (N)	*Hibiscus esculentus*	Fresh	Boiled with soda	92.13	22	25	1.55	0.14	1.88	0.11	1.22	0.32	
Okra (ladies fingers)	Mulembwe (B), Delele (N)	*Hibiscus esculentus*	Fresh	With groundnuts	89.23	49	54	2.55	3.51	1.42	0.51	1.03	0.05	0.16
Pumpkin leaves	Chibwabwa (B) Muchile (T)	*Cucurbita pepo*	Fresh	Raw	85	45	60	3.8	0.4	2.93	0.62	7.18	0.1	39.33
Pumpkin leaves	Chibwabwa (B)	*Cucurbita pepo*	Dried	With groundnuts	70.83	137	181	8	9.58	2.56	0.49	4.62	0.14	28.82
Pumpkin leaves	Chibwabwa (B) Muchile (T)	*Cucurbita pepo*	Fresh	Boiled	85	48	67	3.23	0.47	2.17	0.46	5.6	0.12	10.32
Pumpkin leaves	Chibwabwa (B) Muchile (T)	*Cucurbita pepo*	Fresh	With groundnuts	76.58	119	145	6.32	9.57	1.98	0.4	1.88	0.78	19.19
Pupwe	Pupwe (B)	*Zanthoxylum chalybeum*	Dried	Raw	7.88	308	459	11.37	2.1	8.28	1.19	0.08	-	533.18
Pupwe	Pupwe	*Zanthoxylum chalybeum*	Dried	Boiled with soda	93.16	21	24	11.2	0.2	1.30	0.21	2.25	0.02	10.25
Rape	Mupilu	*Brassica carinata*	Fresh	Boiled	75.81	78	110	6.76	0.99	3.44	0.61	5.53	0.13	49.37

Rape	Mupilu	*Brassica napus*	Fresh	With groundnuts	76.37	116	135	6.99	9.03	2.39	0.31	1.25	0.43	0.27
Rape	Mupilu	*Brassica carinata*	Fresh	With groundnuts	78.9	98	125	6.33	7.16	2.44	0.7	1.4	0.33	0.42
Rape	Mupilu	*Brassica napus*	Fresh	Boiled	75	70	99	6.42	1.01	6.55	0.79	4	0.24	0.63
Red rosella	Sindambi	*Hibiscus meeusei*	Dried	Raw	6.32	320	406	19.68	3.49	8.17	2.04	0.37	0.06	250.4
Lumanda	Lumanda	*Hibiscus meeusei*	Fresh	Boiled	75.82	85	110	13.82	1.43	2.05	0.55	21.1	0.01	28.93
Sesame Seeds	Bwengo (K) Sesame seed	*Ceratotheca sesamoides*	Dried	Raw	2.48	492	603	19.24	42.72	12.58	1.32	-	-	-
Sesamum leaves	Mulembwe utali (B), Lunembwe (L), Katate (N), Bwengo (K, T)	*Ceratotheca sesamoides*	Fresh	Raw	80	65	83	5.25	0.45	2.44	0.63	16.69	0.11	59.25
Sindambi	Sindambi	*Hibiscus meeusei*	Dried	With groundnuts	78.35	104	124	4.74	7.67	2.02	0.28	3.05	0.5	1.02
Solwezi beans	Solwezi beans	*Phaseolus vulgaris*	Dried	Raw	10.93	309	407	19.9	1.57	4.15	1.83	0.06	0.06	105.02
Sweet potato leaves	Kalembula	*Ipomoea batatas*	Fresh	Boiled	61.61	125	166	8.53	1.75	5.41	1.34	31.67	0.16	65.16
Sweet potato leaves	Kalembula	*Ipomoea batatas*	Fresh	With groundnuts	89.34	51	61	2.86	3.79	1.15	0.17	1.64	0.16	0.21
Termite Mushroom	Tunkulumbwe (K)	*Termitomyces spp*	Dried	Raw	9.7	302	439	30.59	2.78	8.95	0.72	0.06	0.04	169.6
West African yam	West African Yam	*Dioscorea spp.*	Fresh	Raw	70	102	120	1.23	0.2	1.44	0.5	0.62	0.51	0.23

Wild bitter Yam	Cooked Chaama	-	Dried	Boiled (Cooked)	70	106	-	0.79	0.4	0.67	0.35	3.89	0.01	24.52
Wild delele	Lusakasaka (B), Tindingoma (N)	*Corchorus tridens*	Dried	With groundnuts	72.85	131	160	6.44	9.61	2.36	0.33	4.18	0.12	54.22
Wild delele	Zumba		Dried	With groundnuts	77.91	102	136	6.39	7.59	2.87	0.24	0.97	0.46	231.82
Zondwe	Zondwe		Fresh	Boiled	52.42	166	189	9.78	1.65	3.07	0.43	4.72	1.54	-
Zondwe	Zondwe		Fresh	With groundnuts	54.41	202	232	8.74	11.64	3.31	0.42	2.67	1.37	-
Zumba	Zumba		Dried	Raw	5.37	331	474	24.69	3.23	5.57	1.55	49.7	0.42	231.82

- *means missing value*

GE and ME are calculated values

Appendix 4: Table 5. WHO / FAO Recommended Daily Dietary Allowances

Age	Body weight (Kg)	Energy[a] (Kcal)	(MJ)	Protein (g)	Vitamin[c] A (ug retinol)	Vitamin D (ug retinol)	Thiamin[c]	Riboflavin[c]	Niacin (mg)	Folic Acid[e] (mg)	Vitamin B[e]	Ascorbic Acid[e]	Calcium[g]	Iron[e] (mg)
Children														
< 1	7.3	820	3.4	14	300	10.0	0.3	0.5	5.4	60	0.3	20	0.5-0.6	5-10 [h]
1-3	13.4	1360	5.7	16	250	10.0	0.5	0.8	9.0	100	0.9	20	0.4-0.5	5-10
4-6	20.2	1830	7.6	20	300	10.0	0.7	1.1	12.1	100	1.5	20	0.4-0.5	5-10
7-9	28.1	2190	9.2	25	400	2.5	0.9	1.3	14.5	100	1.5	20	0.4-0.5	5.10
Male Adolescents														
10-12	36.9	2600	10.9	30	575	2.5	1.0	1.6	17.2	100	2.0	20	0.6-0.7	5-10
13-15	51.3	2900	12.1	37	725	2.5	1.2	1.7	19.1	200	2.0	30	0.6-0.7	9-18
16-19	62.9	3070	12.8	38	750	2.5	1.2	1.8	20.3	200	2.0	30	0.5-0.6	5-9
Female Adolescents														
10-12	38.0	2350	9.8	29	575	2.5	0.9	1.4	15.5	100	2.0	20	0.6-0.7	5-10
13-15	49.9	2490	10.4	31	725	2.5	1.0	1.5	16.4	200	2.0	30	0.6-0.7	12.24
16-19	54.4	2310	9.7	30	750	2.5	0.9	1.4	20.3	200	2.0	30	0.5-0.6	14.28
Adult Man (Moderately active)														
	65.0	3000	12.6	37	750	2.5	1.2	1.8	19.8	200	2.0	30	0.4-0.5	5-9
Adult Woman (Moderately active)														
	55.0	2200	9.2	29	750	2.5	0.9	1.3	14.5	200	2.0	30	0.4-0.5	14-28
Pregnancy (Later half)														
		+350	+1.5	38	750	10.0	+0.1	+0.2	+2.3	400	3.0	50	1.0-1.2	i
Lactation (first 6 months)														
		+550	+2.3	46	1200	10.0	+0.2	+0.4	+3.7	300	2.5	50	1.0-1.2	i

The Letters in the above Table 5 represent the following:-

a- Energy and Protein Requirements: Report of a Joint FAO / WHO Expert Group, FAO, Rome, 1972.

b - As egg or milk protein

c - Requirements of vitamin A, Thiamine, Riboflavin and Niacin: Report of a joint FAO / WHO Expert Group, FAO, Rome, 1965.
As retinol.

e - Requirements of Ascorbic Acid, Vitamin B Folate and Iron: Report of Joint FAO / WHO Expert Group, FAO, Rome, 1970 recommended for non-pregnant, non-lactating women of during pregnancy and lactation should be the same as that.

f - As cholecalciferol.

g - Calcium Requirements: Report of a FAO / WHO Expert Group, FAO, Rome, 1961 satisfactory at the beginning of pregnancy, the requirement is increased; and in the extreme situation of women with no iron stores, the requirement be can probably not met without supplementation.

h - On each line the lower value applies when over 25 per-cent of calories in the diet come from animal foods, and the higher value when animal foods than represent less 10 per of calories.

i - For women whose iron intake throughout life has the level recommended in this table, the daily intake of iron during pregnancy and lactation should be the same as recommended for non-pregnant, non-lactating women of childbearing age. For women whose iron status is not satisfactory at the beginning of pregnancy, the requirement is increased; and in the extreme situation of women with iron stores, the requirement can probably not be met without supplementation.

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Authors

Drinah Banda Nyirenda, Ph.D. Nutrition, Department of Animal Science/Promoter Food Science & Technology Department, University of Zambia. Current address: Senior Lecturer / Consultant, The University of Zambia, School of Agricultural Sciences, Department of Animal Science, P.O. Box 32379 Lusaka, Zambia. E-mail: bandanyirenda@yahoo.com. Tel: +260- 211- 295422 (work), 265519 (home).

Martha Musukwa, MSc. Animal Nutrition, School of Agricultural Sciences, Box 32379 Lusaka. Zambia. E-mail: nampoagrica@yahoo.com, Tel: +260 211 295422 (work), Cell: +260 97 767280

Raider Habulembe Mugode, BA Development Studies; Diploma Food and Nutrition, National Food and Nutrition Commission. Box 32669, Lusaka. Zambia. Email: nfnc@zamnet.zm, Tel: +260 211 227803/4

John Shindano, MSc. Food Science and Technology, University of Zambia, Box 32379 Lusaka. Zambia. E-mail: jshinda@yahoo.co.uk, Tel: +260 211 295422

Reviewed by:

Mubiana Macwan'gi, PhD. Health Behavior & Health Education. Institute of Economic and Social Research (INESOR) University of Zambia, Box 32379 Lusaka, Zambia. Email: mubianam@zamnet.zm, Tel: +260 211 292270

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University of Zambia
School of Agriculture

Centre for International Health
Boston University, USA

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