

FOODS IMPORTED INTO THE TOKELAU ISLANDS

10th May 2008 to 1 April 2012

Revised October 2015



A report prepared for the World Health Organisation (Western Pacific Region)

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This report is for the 112 manifests that were available at the time of preparation. Consequently there has been communication that this data was incomplete and some assumptions revised— however the report still has validity concerning the types of foods, nutrition analysis and relative quantities within year imported into Tokelau

FOREWORD

The Tokelau Stepwise survey (2005-6) reported a high prevalence of non-communicable diseases (NCD) and contributing factors in Tokelau, with a combined risk for NCD of 68.6% (25-64 age groups). NCD has become the major cause of death and overseas referrals in Tokelau.

There has been a shift of diet from traditional and local food to a reliance on imported foods. This work was set out to provide inside information into the importation of food to Tokelau from 2008-2012; what was imported, any pattern in importation and to identify and provide a nutrition profile summary to assist Tokelau in addressing dietary concerns that of high NCD risk for our local population.

Tokelau's low-lying atolls are vulnerable to global changes, such as changes in weather patterns, global warming and rising sea level, availability of fresh water, ability to grow food and financial constraints. All of these affect food safety and security for our people.

I acknowledge the financial commitment and support of the World Health Organization; the hard work and commitments of Professor Elaine Rush, Professor Adam Drewnowski, Ms. Lee Pearce; and all individuals that have assisted in this study and in producing this report.

This is a unique snapshot in time of the imported food supply over a number of years for a whole country. This report provides an opportunity for Tokelau to reflect on the data, as a whole, and to refocus on importation with health benefits rather than importation with detrimental health outcomes. The data becomes a tool for informed policy development and evidence-based decision making. It also provides baseline data for the development of specific strategies, both at national and local level, towards, not only healthy diets and healthy lifestyle, food security, but to create an environment that is supportive of positive lifestyle changes.

Honourable Panapa Sakaria

Minister for Health, Tokelau

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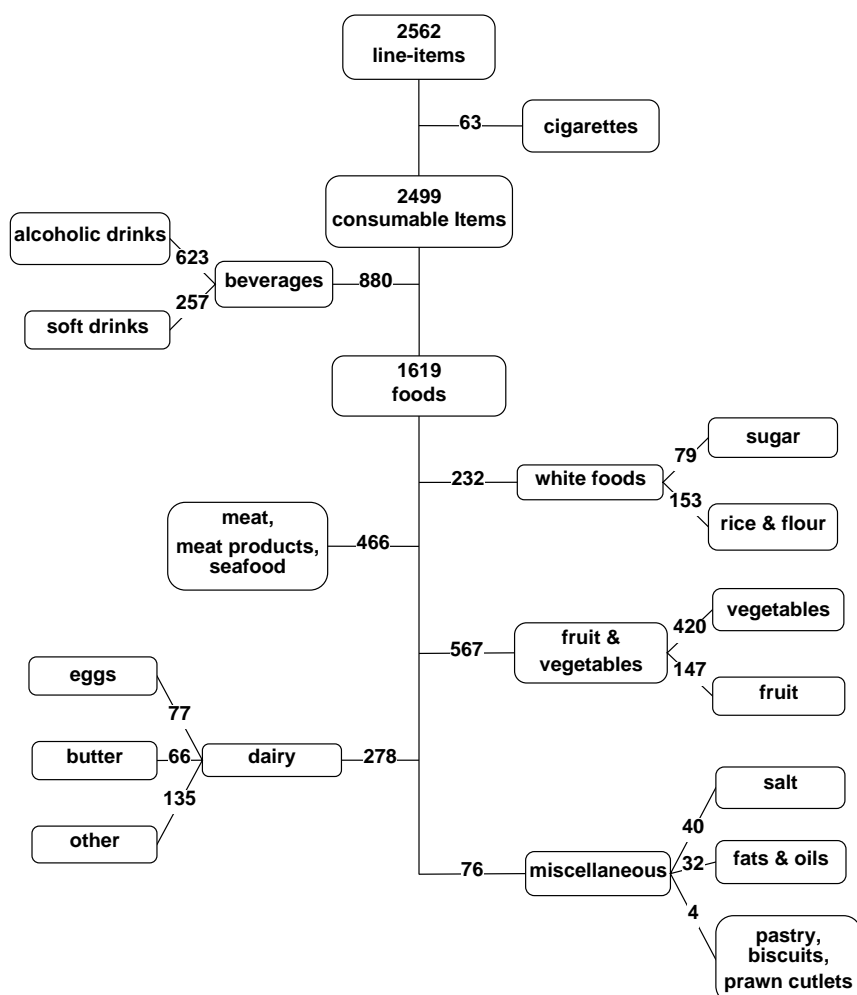
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EXECUTIVE SUMMARY

Healthier diets underpin good health across the life course and for future generations. This opportunity to be able to quantify and examine the nutrients in foods imported to a country over a period of years is unique. The aim was to identify what was imported, any changes over time and to identify through nutrition profiling the healthier, more nutrient dense options. This information would help inform policy and action.

This report was prepared from information obtained from 112 shipping manifests available for the 47 month period 10th May 2008 to 1 April 2012. The total number of line-items shipped, including cigarettes, was 2562. For eighty one distinct food and drink line items and cigarettes the dates and quantities were recorded and analysed. Drinks and foods were categorised as shown in the flow chart below.



Flow diagram of analysis and classification of cigarettes and consumable line-items imported.

How often? Four out of every ten shipped line-items were either spirits, beer or soft drinks.

How much? Two out of every three kg shipped were either soft drink, rice, chicken, beer, sugar or lamb.

Excluding beverages (880 line-items) the most frequently shipped foods were protein foods: corned/salt beef, chicken, sausage, egg and lamb. Flour, ice-cream and rice were frequently included as were butter and fruit and vegetables.

The contribution of Tokelau grown and sourced fruit, vegetables and seafoods to the diet is not known.

Cigarettes

The number of cigarettes imported **decreased by one third** between 2008 and 2012; from **155000 to 100000** cigarettes a month.

Energy

The estimated daily food energy requirement of an adult is between 8 and 10 MJ/day (New Zealand and Australia Nutrient Reference Values). Average energy from imported foods and beverages was 6 MJ/day/person which accounts for more than half the total dietary energy requirements of the Tokelauan population.

Alcoholic drinks

While the quantity of alcohol imported into Tokelau reduced by a factor of two between 2008 and 2012 in 2012 the quantity was still high; equivalent to one standard drink a day for every Tokelauan aged more than 15 years.

Soft (sugary) drinks

The amount of sugar imported into Tokelau reduced by a factor of six between 2008 and 2012. This dramatic reduction meant for every Tokelauan a reduction from 6 teaspoons a day in 2008 to one teaspoon a day in 2012.

Rice, flour and sugar

Rice, flour and sugar (mainly brown) contributed more than two thirds of the total energy (3.4 MJ a day) supplied by imported foods (excluding all drinks).

Rice, flour and sugar are major sources of carbohydrate but contain little protein, few minerals or vitamins and a negligible amount of fibre.

Food quality

Based on nutrient profiling the most nutrient dense (healthier) foods imported included eggs, fish, prawns, lean beef mince, all the vegetables and fruits, and milk and cheese. The least healthy foods were those high in fat, sugar or salt and included sheep and lamb cuts including chops, pork products including ham and bacon, canned corned and salt beef and sausages.

Recommendations

- Imports should continue to be monitored and progress tracked to measure progress against targets.
- Consideration be given to developing a check list for foods that guides decisions based on;
 - ✓ availability and ranking of foods against the nutrient profile
 - ✓ cost in relation to quality of nutrients provided.
 - ✓ the practicality of leaner cuts of meat with bone removed.
 - ✓ sustainability – i.e. amount of packaging and waste that products contribute e.g. cans and bottles.
- Adopt a thinking global and acting local framework, following for example the GO LOCAL recommendations of the late Dr Lois Engleberger, Island Food Community of Pohnpei.

Step 1: Plant some local foods

Step 2: Add some local food to your diet

Step 3: Maintain & harvest your island foods

Step 4: Be proud of your culture & foods

To add to the food supply

A celebration of local foods especially fish and ways of storing including drying. Explore further the contribution of local fish, seafoods and plants to iodine, selenium and calcium to the diet.

To subtract from the shipments

Set achievable targets and systems of monitoring reduction in the import frequency and quantity of cigarettes, alcohol and sugary drinks.

Set achievable targets and systems of monitoring reduction in the amount of packaging and waste (plastic and cans) imported and ways of recycling or exporting this waste.

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GLOSSARY

atoll	Tokelau has three ring-shaped coral reefs or atolls that encircle a lagoon, Atafu, Nukunonu and Fakaofu
aumaga	work force
aufai amisiluki	green bananas
aufai paka	green bananas
aufai samoa	green bananas
cawarra	yams
fatupaepae	women's groups
fono	meeting
food category	NZ food composition tables food categories
food energy	the energy contained in food that when released allows the body to move and to do work, measured in megajoules (MJ) or kilocalories (kcal). An average adult requires 8 to 10 MJ of food energy a day
food group	four main food groups cereals, protein, fruits and vegetables, dairy
macronutrient	components of food that provide energy – carbohydrate, fat, protein and alcohol
NCD	non communicable disease such as diabetes, cardiovascular disease, cancer
Taupulega	local chief, each atoll comes under the direction of the atoll council lead by the local chief
Tokelau	“North Wind”

ABOUT TOKELAU

Geography

Tokelau consists of three atolls located in the South Pacific about 483 km north of Samoa. Atafu is the northernmost atoll, 92 km north of Nukunonu, which in turn lies 64 km north of Fakaofu. Total land area is 12 square kilometres.

People

In October 2011 the usually resident population of Tokelau was estimated at 1411¹; the world's second smallest population after the Vatican City². On the census night (October 18, 2011) 1143 usually resident people were present, 268 were absent and 62 international visitors were present making a total of 1205 present. In the 2006 census 1074 were present on census night so the population has slightly increased. In 2006 in New Zealand over 6800 people, five times more, identified with the Tokelauan ethnic group.

One third of the population was aged less than 15y. For every 1000 residents about 20 babies are born each year.

Quick Statistics for Tokelau

Total land area 12 square kilometres

Population (2011) **1411**

Aged under 15 years **33%**

Number of people/household – **1 to 8+**

More than two thirds of households earn **NZD \$15000 or less each year**

Two thirds of the population aged 15-64 y had a **BMI greater than 30 kg/m²**

¹ Statistics New Zealand (2012). *Profile of Tokelau Ata o Tokelau: 2011 Tokelau Census of Population and Dwellings / Tuhiga Igoa a Tokelau 2011 mo te Faitau Aofaki o Tagata ma na Fale*. Wellington: Statistics New Zealand

² (<http://www.stats.govt.nz>) and <http://www.tokelau.org.nz/About+Us.html>

Health Status

In 2010 the Tokelau Health Mission, measured the body mass index (BMI) of the whole population resident at the time in Tokelau, the results of which were given to Medical Officers to monitor and conduct health promoting activities.

The transport services which are provided at the village level, come under the direct responsibility of each Taupulega (village council lead by the village chief). Each Taupulega delegates the responsibilities of managing this service to the village general manager (Director or Coordinator). For example, the village aumaga (work force) provides the stevedoring in Tokelau, while in Apia a private company is contracted to provide this service.

Between 2008 and 2012 three ships were responsible for freight from Samoa to Tokelau. They were the motor vessels (MV), MV Samoa Express, the Lady Naomi and MV Tokelau with the bulk of the shipments of goods provided by the MV Tokelau.

From 2012 Tokelau operates one chartered ship – the Pacific Basin Shipping Ltd vessel, the PB Matua. The PB Matua can carry up to 50 passengers and is scheduled to travel to Tokelau on a fortnightly basis. The duration of the round journey varies between 4 to 10 days depending on inter-atoll and national and village activities (for example training, consultation, council meetings and fonos).

The schedule of shipping may be disrupted due to unplanned medical evacuations from the villages to Apia, search and rescue operations, and natural disasters such as hurricanes. Samoa shipping company vessels are chartered to transport passengers between Apia and Tokelau, large orders of supplies including fuel and for transporting large numbers of people between atolls. The regularity of the service and therefore the delivery of food cannot be guaranteed.

Food security means having easy access to enough healthy food every day. The food must be culturally and socially acceptable. The irregularity of the shipping service, climatic and seasonal factors, the quality and cost of the foods imported and the availability of local food all impact on the food security of Tokelauan people. The food delivered by the PB Matua is essential for the survival of the Tokelau people.

WHAT WAS DONE

Aims and objectives

The work that was undertaken in collaboration with the Ministry of Health, Tokelau and the World Health Organization South Pacific was to prepare this report to

1. Assess the nutrition profile of imported foods and beverages
2. Describe changes in the nutrition profile of imported foods and beverages to Tokelau over the period 2008 to 2012
3. And provide a policy brief recommending regulatory or other mechanisms to ensure the nutrition quality of imported foods in Tokelau

Methods and rationale

One hundred and twelve manifests were received that recorded the shipment of food and drink dated between 10th May 2008 and 1 April 2012.

Each manifest was identified by date of shipping and cigarette and edible food items were identified by inspection. Each item was a single line in the manifest which stated any marks that were on the item the number of packs, unit description e.g. cartons, bags, pallets, boxes, a food description, cubic (volume) and weight in kilograms. This information was placed into an Access database™ with the date of shipment and the shipper. Each item shipped was a single line of information in the spread sheet and was assigned a unique ID number for purposes of data management. Throughout this report a single line of information is referred to as a line-item. The information from the manifests was not complete with some missing or confusing detail; assumptions were made based on other shipments and in consultation.

Imports of cigarettes were documented because the focus for the report was to be useful to the people of Tokelau. Smoking is associated with poorer health including that of non-smokers in the community. Exposure to smoke is manifested through hypertension and other diseases such as Type 2 diabetes, cardiovascular disease, respiratory infections and diseases such as asthma, bronchitis and emphysema.

Each edible line-item was matched to a food in the NZ Food Composition database³ (Appendix A1) and the energy, alcohol, total carbohydrate, sugar, total fat, saturated fat, protein, fibre and sodium content for 100 grams of each food imported from the database.

³<http://www.foodcomposition.co.nz/>

Each edible food identified was matched to a category of food in the NZ food composition database. e.g. F was dairy (Appendix A2 for full list of categories).

The imported weight of the food was determined from the quantity of food minus the weight of the packaging including bottles, pallets and cardboard. When the information provided in the manifest was incomplete assumptions were made about the quantity and other details based on other shipment information (Appendix A3). Furthermore, for foods that produce waste during the process of preparation such as peelings or bones, the proportion of the weight that was edible was used to determine the edible weight (Appendix A4).

Alcoholic beverages and sugary drinks are described in the first part of the report and then excluded from the subsequent analysis. These beverages do not contain any nutrients apart from alcohol, sugar (and water). They are a source of energy but are not foods associated with health and well-being.

The main analysis of imported food excluded alcoholic and sugary drinks.
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Foods that are a major source of carbohydrate but have very few other nutrients such as vitamins, minerals and fibre were considered next. These refined foods included imports of sugar (mainly brown), white flour and rice.

Edible line-items were separated into “food” groups. White refined foods were considered as part of the cereal group. The other food groups included protein, fruit and vegetables and dairy and align with the New Zealand food based dietary guidelines.

Protein is essential for the growth, repair and function of the body. Protein is the most sought-after nutrient in world trade and also the most expensive. The “highly prized” foods that are good sources of protein included meat, fish and eggs. These foods help to satisfy appetite and give a feeling of fullness.

Fruits and vegetables contain many nutrients including fibre, vitamins and minerals. Regular consumption of a variety of different coloured fruit and vegetables helps protect against cardiovascular disease, diabetes and cancer. They also help maintain a healthy weight.

Dairy products such as milk and cheese are a major source of calcium. Calcium is essential for strong bones and teeth and needs to be consumed every day. Calcium can also be obtained from non-dairy foods including seafood and shrimp. If softened fish bones are eaten they are a source of calcium e.g. as in sardines and mackerel.

Dietary fibre is only found in plants including grains and legumes, fruit and vegetables. Fibre is required for bowel health and also management of blood sugar.

The sodium most commonly found in foods is derived from sodium chloride. Sodium is an essential mineral but an excess of sodium – more than 2.3g (a teaspoon of salt) a day is associated with high blood pressure⁴. Table salt should be fortified with iodine, another mineral that is essential for normal growth and development particularly of the brain and nervous system. Significant quantities of iodine are also found in food from the sea⁴.

Finally, foods were assessed from the point of view of what nutrients they contributed to a balanced diet to promote health and well-being and prevent disease. Foods were identified, classified and ranked in terms of how much energy, sugar, saturated fat and salt they contain (less healthy), and also how much protein, dietary fibre and fruit and vegetables (more healthy). This was reported in the section on nutrient profiling and the scoring detail is described in Appendix A5.

⁴ Commonwealth Department of Health and Ageing Australia, Ministry of Health NZ & National Health and Medical Research Council (2005) *Nutrient Reference Values for Australia and New Zealand including Recommended Dietary Intakes*. . Canberra Commonwealth of Australia and New Zealand Government.

OVER VIEW OF FREQUENCY OF SHIPMENTS

The total number of manifests received was **112** and over the **47 month** period **2562** items were shipped. Frequency of shipping was not regular. Shipping frequency in 2010 was twice that in 2011 – 39 shipments in 2010 and 17 in 2011 (Figure 1 and Table 1). The irregularity of shipments was related to transition to interim shipping provider, availability of an alternative ship, the shipping schedule (if it was a fuel run, no other goods or passengers were permitted to travel on that ship) and funding.

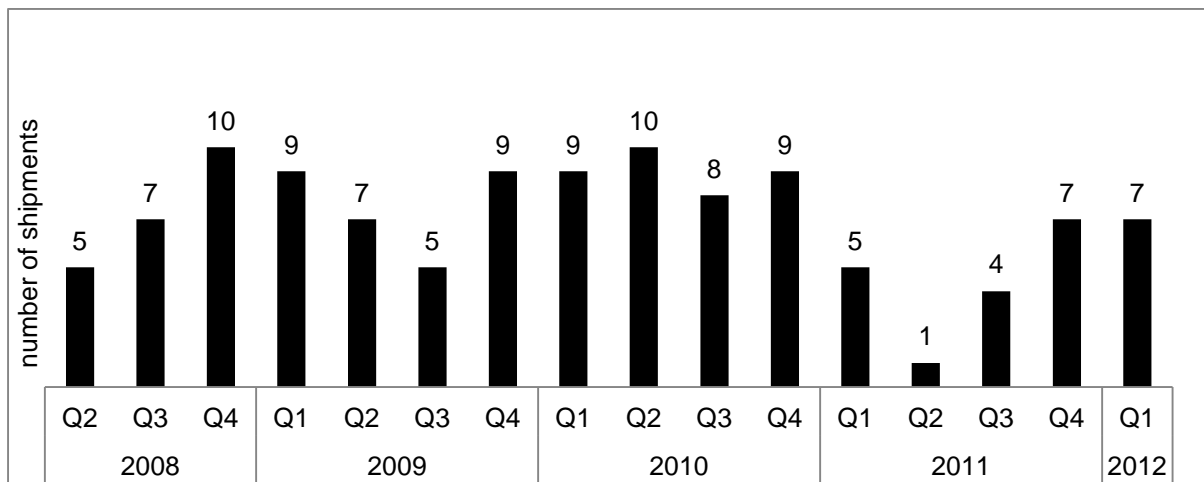


Figure 1: Number of manifests received for shipments between 10th May 2008 and 1 April 2012 by year and quarters.

Q quarters, a period of three months

Table 1: Frequency of shipments from Apia to Tokelau from 2008 to 2012

Year	Months	Line-items	Shipments	Shipments/month
2008	8	549	22	2.8
2009	12	871	30	2.5
2010	12	590	36	3
2011	12	401	17	1.4
2012	3	151	7	2.3
Total	47	2562	112	

A total of 112 manifests that included consumable items were shipped from Samoa to Tokelau over 47 months. On average 23 distinct beverage, food and cigarette line-items were included in each shipment but the number of line-items in each shipment ranged from 1 to 52.

PROFILE OF PRODUCTS SHIPPED

Eighty one distinct beverage and food products were identified (Appendix A1). For simplicity, and because the nutritional content differs very little, all spirits were grouped together under one product: spirits, and all soft drinks (non diet) were identified as lemonade. Salt beef and corned beef were both classified as corned beef.

Excluding beverages (880 line items) the most frequently shipped foods were protein foods: corned/salt beef, chicken, sausage, egg and lamb. Flour, ice-cream and rice were frequently included as were butter and fruit and vegetables (Table 2).

Based on the manifests a total of 1408 tonnes (1 tonne =1000 kg) were shipped in the 47 months. This was the total gross weight of each line item recorded in the manifest. **It is noted that 31 line items had no manifest information on shipping weight. Due to both missing data and inaccuracies identified in manifest data line item weights have been recalculated based on product descriptions (i.e. unit quantity and unit weight). This recalculation estimated, excluding packaging, that 1337 tonnes of product were imported during the 47 months.** The twenty most frequently shipped line items (Table 2) accounted for 77% of all line items. The top twenty line items by shipping weight (**recalculated**) accounted for 94% of the total weight of shipped consumables included cigarettes.

Table 2: Most frequently shipped line-items ranked by how often they were shipped and by **food** weight shipped within a 47 month period.

How often?

Line-item	Number of lines
Spirits	302
Beer	263
Soft drink (cans/bottles)	243
Salted/corned beef	87
Chicken	86
Sausage	77
Egg (whole)	74
Lamb/mutton (pieces, necks, flaps)	74
Flour (wheat, white)	73
Ice cream	73
Potato	71
Onion	69
Rice (white, polished)	68
Butter	66
Cabbage, white	66
*Cigarettes	63
Orange	61
Apple	61
Carrot	58
Pumpkin	53
Total/2562 line-items	1988

* not edible

How much?

Line-item	Weight (kg)
Soft drink (cans/bottles)	199 600
Rice (white, polished)	180 300
Chicken	165 800
Beer	132 600
Sugar, brown	112 700
Lamb/mutton (pieces, necks, flaps)	94 500
Flour (wheat, white)	75 100
Potato	69 700
Sausage	62 800
Onion	22 200
Salted/corned beef	22 100
Egg (whole)	22 100
Ice cream	16 700
Spirits	15 700
Taro	13 400
Water	13 200
Pumpkin	9 900
Apple	9 800
Orange	9 700
*Cigarettes	9 600
Total /1 337 200 kg	1 257 500

- Note weights based on kilograms calculated for each line item and does not include packaging

CIGARETTES

The number of single cigarettes was calculated from the number of cartons shipped. One carton was “said to contain” 10000 cigarettes i.e. 50 x 10 x20 cigarettes. The number of cigarettes shipped in 2010 was **two thirds** the number shipped in 2008. This very favourable reduction in a major risk factor for non-communicable disease was maintained in 2011 and 2012 (Table 3).

Table 3: Number of cigarettes shipped by year.

Year	Number of cigarettes	Line items	Months	Cigarettes/month
2008	1 240 000	15	8	155 000
2009	1 890 000	19	12	157 500
2010	1 340 000	14	12	111 667
2011	1 290 000	10	12	107 500
2012	300000	5	3	100 000

The favourable reduction may be attributed as an outcome from the inaugural non communicable disease (NCD) meeting in Apia in 2009 which was attended by two representatives from the Tokelau smoking cessation team, a health promoter from the Regional Public Health service and nominated representatives from all three atolls, comprising Taupulega, Fatupaepae and youth leaders. The Minister of Health – Tokelau was also present together with representatives from the World Health Organization and the United Nations Population Fund (UNFPA).

For Tokelau there was an inaugural NCD workshop, named Tokelau Olatia, and smoking cessation trainers from the Pacific smoking cessation pilot in New Zealand travelled to Samoa and then Tokelau in May/June 2010. Support for individuals that wish to quit smoking is limited as nicotine replacement therapy is expensive and the regularity of supply and distribution has challenges. On the other hand the extent of importation in personal baggage, other boat deliveries and smuggling of cigarettes and local plants smoked (if any) are not known.

The reduction in smoking frequency from 2008 to early 2012 and the stop smoking message should continue to be supported. The delivery of the existing NCD plan for smoking cessation should be supported through coordinated and group activities and workshops by medical officers and health staff.

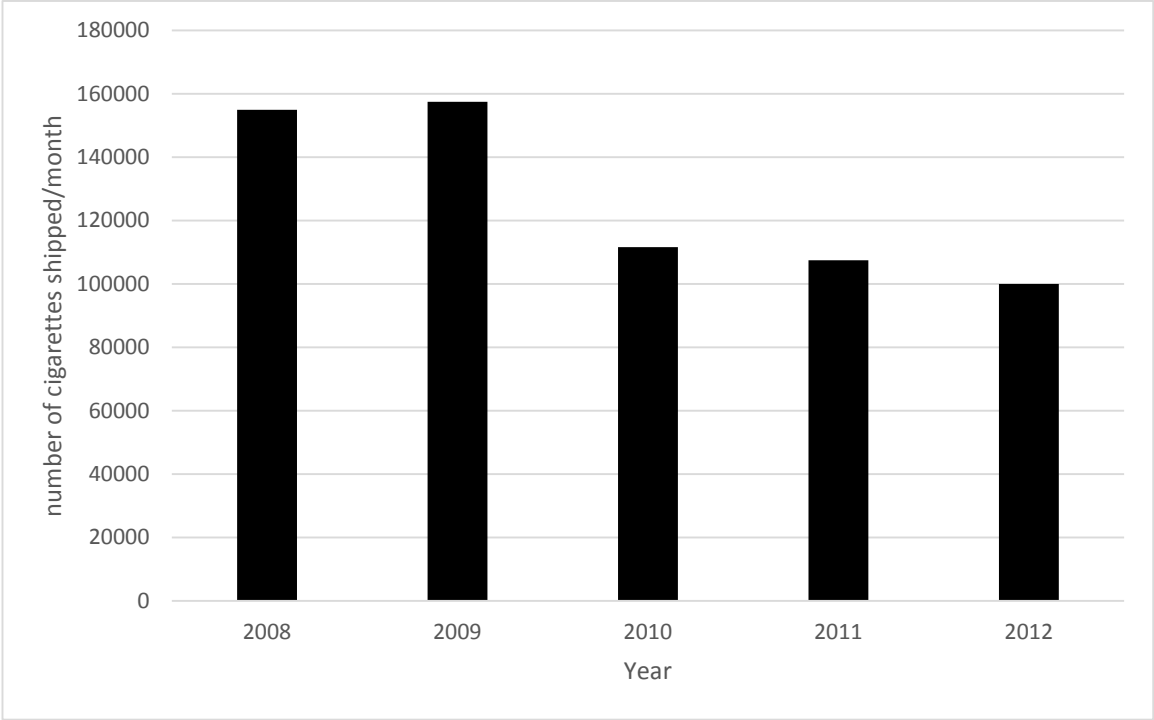


Figure 2: Number of cigarettes imported each month by year

TOTAL ENERGY IMPORTED

Food and drink provide four macronutrients that supply energy to the body. While fat, protein and carbohydrate all have other essential functions, alcohol is not an essential nutrient.

Almost two thirds of total energy imported, including all beverages, was in the form of carbohydrate (Figure 3).

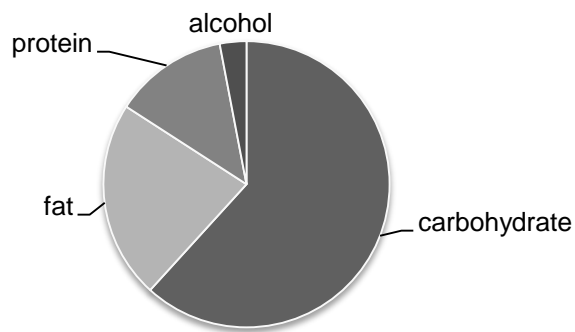


Figure 3: Proportions of total energy imported between 2008 and 2012 from the four macronutrients

Over the period of 47 months almost 10 million megajoules (MJ) of food energy were imported. On average an adult person requires 8 to 10 MJ of energy a day dependent on age, body size, physical activity, pregnancy and breastfeeding. Over the period 2008 to 2012 the energy from imported food was equivalent to 6MJ/day/person (Figure 4).

Between 2008 and 2012 more than half the food energy necessary each day for 1200 people were imported.

3% of total energy was from alcoholic beverages

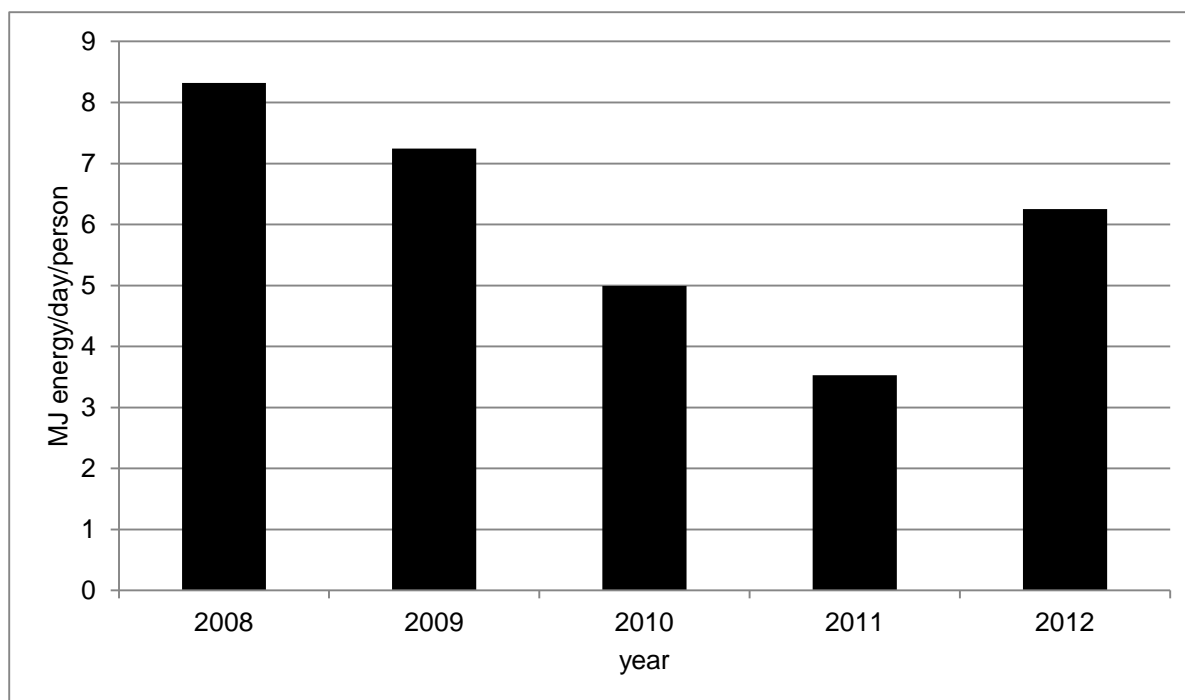


Figure 4: By year the daily average of total food energy **including beverages** imported for each Tokelauan (n=1200)

In 2011 the rate of import of energy was severely reduced – to ~3.5MJ/day/person (Figure 4). This reduced rate of supply was at the same time as the number and regularity of shipments to Tokelau was reduced (Figure 1).

ALCOHOLIC DRINKS

Of the 2562 items shipped over the period, **573** were alcoholic drinks. This represents **almost** one quarter (**22%**) of all line-items.

The total weight of these drinks and therefore the amount of alcohol imported into Tokelau reduced between 2008 and 2012 (Table 4). The quantity at the beginning of 2012 was enough for each of the 800 residents over the age of 15 years to have one standard drink every day.

Table 4: Quantity of alcohol from alcoholic drinks

Year	Alcohol (kg)	Items/lines	Months	kg/month
2008	2330	117	8	291
2009	3083	230	12	257
2010	2195	151	12	183
2011	2228	101	12	186
2012	446	24	3	149

Note: One standard drink is equivalent 10g of alcohol – 1 kg of alcohol is equivalent to 100 drinks

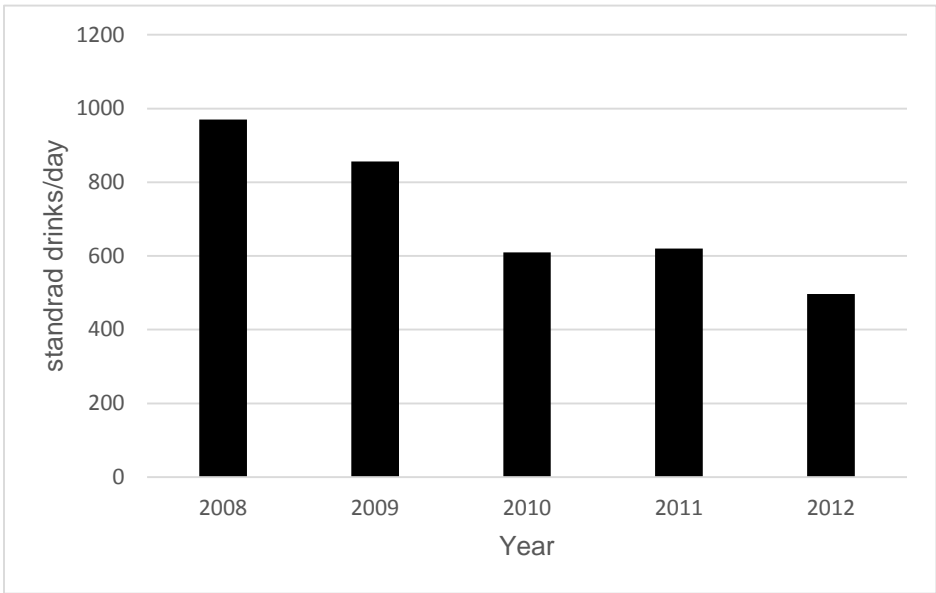


Figure 5: Average daily rate of supply of standard drink equivalents imported into Tokelau

More than half the alcohol overall, and in each year, was in the form of beer and a third to almost a half was supplied as spirits i.e. vodka, gin, whiskey and rum (Table 5).

Table 5: Percentage of alcohol type shipped yearly

Year	Beer	Spirits	Liqueur	Wine
2008	51.4%	47.4%	0.3%	0.9%
2009	47.2%	51.0%	0.3%	1.5%
2010	54.3%	44.6%	0.0%	1.2%
2011	48.0%	49.6%	0.7%	1.7%
2012	58.6%	39.0%	0.0%	2.4%

Alcohol, like tobacco consumption, was known by Tokelau to be high. In 2005 more than nine out of ten men and women drank alcohol⁵. In 2011, one atoll, Atafu, banned alcohol and enforced the ban. Following an alcohol related death in 2012 another atoll, Nukunonu, also banned alcohol.

ANALYSIS OF FOOD ITEMS – EXCLUDING ALCOHOLIC DRINKS

Sugary drinks

(Non alcoholic beverages)

Table 6: Quantity of sugary drinks

Year	Litres	Items	Months	Litres/month
2008	56449	73	8	7056
2009	65384	80	12	5449
2010	57418	71	12	4785
2011	30904	30	12	2575
2012	3408	3	3	1136

⁵ Tokelau NCD risk factors Steps Report, 2005, World Health Organization Western Pacific Region

In the 2008 to 2012 study period **213 500 litres of soft drink** were imported into Tokelau (Table 6). The rate of importation/month was less in 2012 than in 2008.

In 2011 an additional 29 000 kg of drinking water was imported as well as 240 kg fruit juice, and 426 kg diet soft drink;. For the first three months of 2012 the rate of soft drink importation was equal to **11** litres/person/year.

In 2008 soft drink consumption was calculated at 43 litres (**this report 70 litres**) per person per annum and presented to each Taupulega following the 2009 NCD Meeting. Since then, one atoll has banned soft drinks and the key performance indicators for the Joint Commitment for Development was no new cases of Type 2 diabetes or hypertension and an increase in reported physical activity.

Table 7: Imported non-alcoholic beverages (soft drink) content of sugar*

Year	sugar (kg)	line-items	months	kg/month
2008	6150	73	8	769
2009	7075	78	12	590
2010	6259	71	12	522
2011**	2009	29	12	167
2012	3719	3	3	31

Notes: *Sugar and water are the only nutrients in soft drink; **Irregular shipments

In the study period a total of **21 000 kg of sugar** were imported into Tokelau in the form of soft drinks (Table 7 and Figure 6).

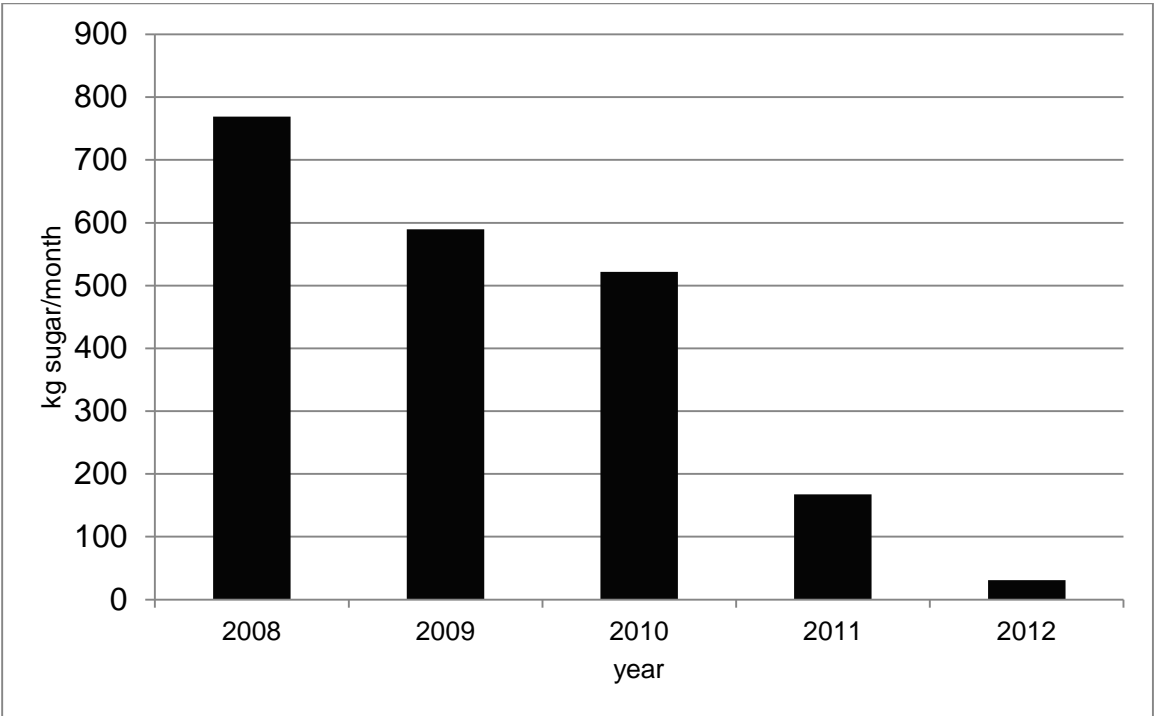


Figure 6: Average amount of sugar in kilograms imported each month in soft drinks

Compared with 2008 the amount of sugar in imported soft drinks was reduced to one fifth in 2011 and this lower rate of importation of sugar in sugary drinks was maintained in the first three months of 2012 (Figure 6).

In 2012 the amount of sugar imported in sugary drinks was equivalent to **1** kg/day. This is **less than one fifth of a teaspoon** of sugar a day for every resident of Tokelau. In 2008 the daily sugar was **5** teaspoons each. This dramatic reduction is commendable and progress to zero importation of sugary drinks should be encouraged. Apart from obesity, sugary drinks are damaging to teeth and also contribute a large amount of non-recyclable/non-biodegradable waste to the local environment.

The total recorded weight of beverages (gross weight: packaging plus liquid portion) imported was **in excess of 353 000 kg**.



The next section excludes all beverages i.e. alcoholic and soft drinks and only examines the food line-items imported.

Food Groups

From 2008 to 2012, 1619 food items were imported and these were divided into food categories according to sections of the NZ food composition tables and into groups as defined by the food based dietary guidelines⁶. There are five food groups for Pacific and New Zealand people – these are cereals and grains, dairy, fruit and vegetables, and protein foods. The fifth group is “Other” and includes occasional foods. Classification of the foods in the shipping lists into these groups is presented in Table 8.

Table 8: Classification of line items by food category and food group

Food categories	No. line-items	Example(s)	Food group
Bakery products	1	Pails of biscuits	Cereal
Cereals	153	Rice, sago	Cereal
Dairy	278	Butter, eggs, ice cream	Dairy
Fast foods	2	Prawn cutlets	Other
Fats and oils	32	Margarine, oil	Other
Finfish	1	Hoki	Protein
Fruit	147	Apples, oranges	Fruit and vegetables
Meat	379	Chicken, lamb, corned beef	Protein
Meat products	79	Sausages, ham	Protein
Miscellaneous	40	Salt	Other
Recipes	1	Pastry	Cereal
Shellfish	7	Crab meat	Protein
Sugar, confectionery and sweet spreads	79	Sugar, iceblocks, icing sugar	Other
Vegetables	420	Potato, onions, taro	Fruit and vegetables
Total	1619		

The most frequently shipped items were meat, fruit and vegetables, dairy and cereals accounting for 1377 of the 1619 items or 85% of the foods shipped (excluding alcoholic and soft drinks).

⁶ <http://www.health.govt.nz/our-work/preventative-health-wellness/nutrition/food-and-nutrition-guidelines>

Edible weight of foods

Many foods during preparation and consumption have waste or portions that are discarded.

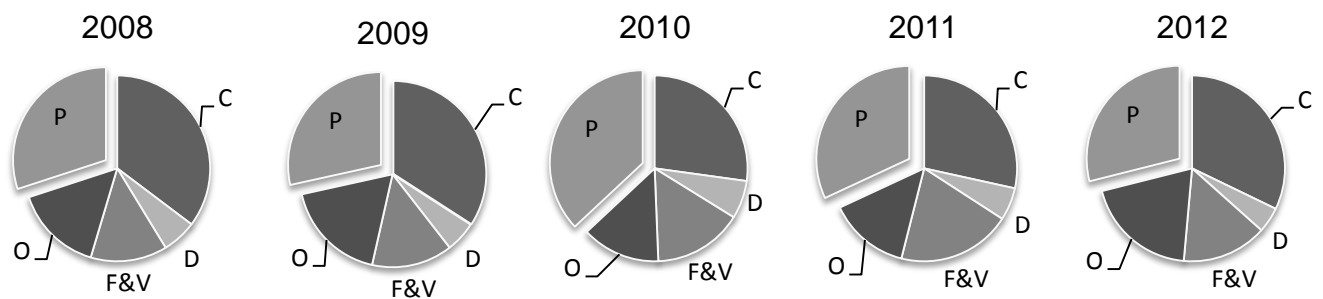
Examples include bones in meat, and peel and ends of vegetables. Edible weight was calculated for all items and Appendix 4 gives an estimate of the edible portion of foods that have waste. Rice and brown sugar contributed one third of the weight and half of the energy imported (Table 9).

Table 9: Top 10 foods ranked by total raw edible weight and energy available of food items.

Rank	Food	% of total edible weight imported	Food	% of total food energy imported *
1	White rice	21.0	White rice	28.5
2	Chicken	15.7	Brown sugar	19.4
3	Brown sugar	13.1	White flour	11.4
4	White flour	8.7	Chicken	9.1
5	Potatoes	7.3	Lamb	6.6
6	Lamb	6.5	Sausages	6.3
7	Sausages	5.3	Corned beef	3.1
8	Corned beef	2.6	Potatoes	3.0
9	Eggs	2.6	Egg	1.8
10	Onions	2.3	Onions	1.4

*Excluding beverages

These **top 10** by edible weight foods were responsible for **87%** of the total edible weight of all foods and **91%** of all the food energy (**less beverages**) imported into Tokelau (Table 9).



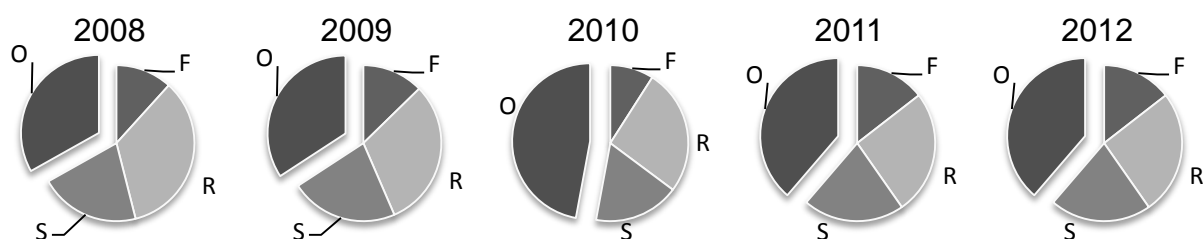
Food groups: P protein, C cereal, D dairy, F&V fruit and vegetables, O other

Figure 7: Proportions of edible weight by food group and year.

By edible weight the proportions of foods classified into the five food groups varied little (Figure 7). Each year cereal and protein foods (the upper segments of the pies) represented more than half of the edible weight of food shipped. The 2012 pie had 21 tonnes (21,000 kg) of salt excluded. Normally salt was included in the “other” category but it is understood that this salt was for use in smoking and preserving seafood on Nukunonu rather than for adding to food during or after cooking (personal communication, Lee Pearce).

Refined foods: flour, rice and sugar

Refined carbohydrate foods such as flour, rice and sugar are known to increase blood sugar because they are easily digested and absorbed quickly. These foods are major sources of carbohydrate, but contain little protein, few and low amounts of minerals or vitamins and a negligible amount of fibre. Nutritionally they are considered less healthy and detrimental for weight control and prevention and management of obesity, diabetes and cardiovascular disease⁷.



F white flour R white rice S sugar O all other foods excluding beverages

Figure 8: Proportion of food energy from the refined carbohydrate foods, sugar, rice and flour, in relation to energy contained in all other foods .

Rice, flour and sugar (mainly brown) contributed almost two thirds of the total food energy imported (Figure 8). These foods are considered less healthy (see later section) and because of the relative quantity imported contribute little to a nutritionally adequate and balanced diet.

⁷ Brand-Miller, Buyken. 2012 The glycemic index issue. *Curr Opin Lipidol*.

Protein foods

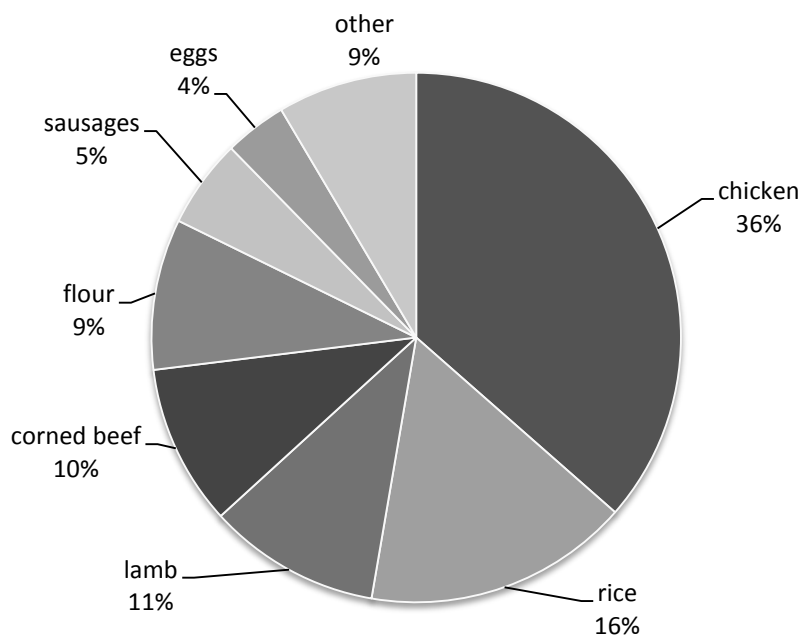


Figure 9: Proportion of weight of imported protein by food

Chicken, rice, lamb, beef, flour, sausage and egg together provided 91% of the weight of protein imported over 47 months (Figure 9).

Chicken and rice combined accounted for half of total protein imported. Rice protein is an “incomplete” protein because it does not contain all the essential amino acids. Similarly protein from flour and rice are not complete.

Lamb, beef, sausages and eggs are very good sources of protein as they contain all the amino acids essential for life. The amount by weight of protein in chicken, lamb and beef is reduced dependent on how much bone, skin and fat the cuts of meat contain.

Of all the foods imported beef and lamb were the two that are a good source of the essential mineral **iron** which is necessary for healthy blood and immune function.

Fish is also an excellent source of protein but was not included here, as very little was imported.

Fruit and Vegetables

The relative quantity, by weight, of fruit and vegetables imported was low.

A total of 15 000 kg of fruit and 110 000 kg of vegetables were imported over 47 months.

Fruit

The two most frequently shipped and heaviest weights fruit were apples and oranges.

Seven thousand kg of apples and 6 000 kg of oranges were shipped. Relatively small quantities of bananas, pears and lemons were imported. Only one shipment of each of breadfruit, pineapple and rock melon occurred.

Vegetables

Fifty percent by weight (57 000 kg) of imported vegetables was potato – in 71 shipments. Onions were shipped 69 times and totalled 20 000 kg. Cabbage, carrots and pumpkin were shipped more than 50 times each. Taro was shipped 26 times and contributed 11 000 kg by weight.

Frozen vegetables, in descending order by weight, were mixed vegetables, potato fries, corn and peas.

Small quantities of lettuce, tomato and cucumber were also imported.

Fibre foods

There was very little fibre in the imported foods

Fibre is found only in cereals and fruit and vegetables. Fibre is essential for healthy digestion and helps reduce blood glucose levels after a meal.

Table 10: Total amount of dietary fibre imported over 47 months by food group

Food group	Fibre (kg)	All foods (kg)
Cereal	6325	631911*
Fruit and vegetables	2812	125114
Protein (meats)	699	257863

* Includes weight of cereal if rice cooked

The fibre in the protein foods is derived from sausages and meat products like luncheon meat. These “meat” products include cereals in the ingredients (Table 10).

Fruit and vegetables (Table 11) were the best source of fibre of the imported food groups. On average the fruit and vegetables contained 2.2% fibre by weight.

Cereals, because of the large quantity imported contained overall more fibre than the fruit and vegetables but on average contained 0.1% fibre by weight.

Table 11: Total weight and edible weight of fruit and vegetables imported over 47 months.

Ranked by weight (kg)

Rank	Fruit	Total kg	Edible weight kg	Vegetable	Total kg	Edible weight kg
1	Oranges	9760	6344	Potatoes	69760	56720
2	Apples	9734	7380	Onions	22280	20052
3	Bananas	685	434	Cabbages	6661	5998
4	Breadfruit	600	480	Carrots	4850	3910
5	Pears	291	233	Mixed Veges	2688	2688
6	Lemons	250	113	Potato Chips	990	990
7	Pineapples	54	24	Cassava	620	470
8	Rock melon	40	22	Sweet Corn	593	593
9				Cucumber	214	171
10				Corn on Cob	168	92.4
11				Tomatoes	104	103
12				Frozen Peas	60	60
13				NZ Lettuce	50	38
14				Yams	16	13

Foods high in fat

In total 58 000 kg of fat was imported and 26 000 kg of that was saturated fat. This means that 45% of the imported fat was saturated. By weight fat has twice as much energy as carbohydrate and protein.

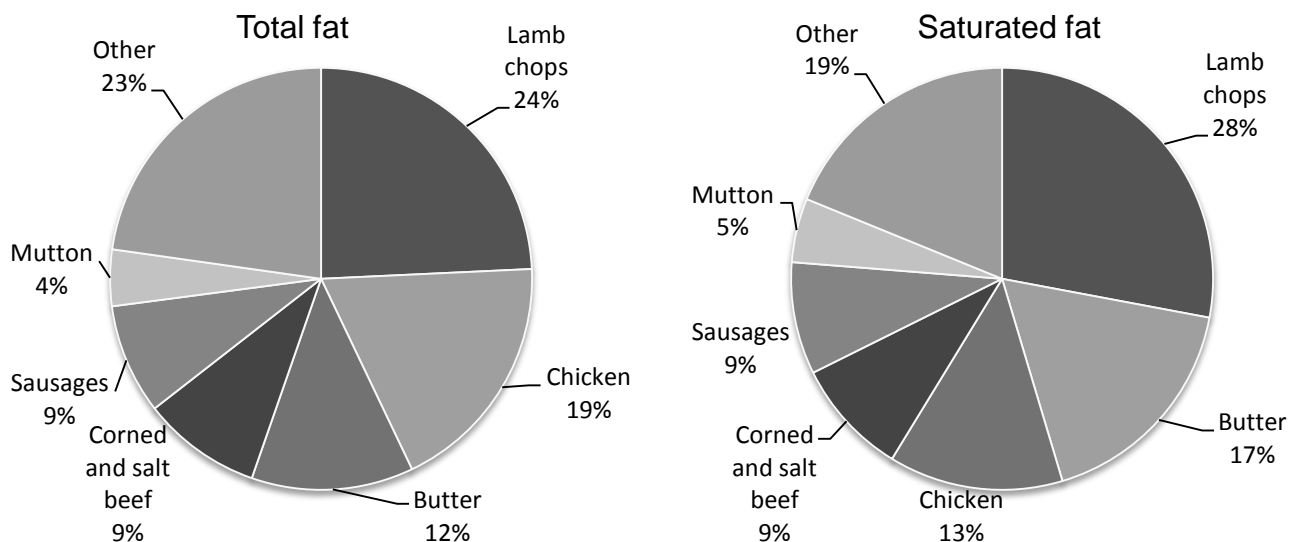


Figure 10: Proportion of weight of total fat and saturated fat by imported foods

The six foods that contributed almost 80% of the total fat content to the imported foods were lamb chops, chicken pieces, butter, corned and salt beef, sausages and mutton (Figure 10).

These same foods also contributed more than 80% of the saturated fat content.

The major sources of fat were of animal origin. It is known that fish and most plants contain polyunsaturated fatty acids that are essential to health. Oily fish such as tuna provide fats that are associated with good health.

Sodium

Sodium was imported into Tokelau in two ways – contained in the food and as iodised salt.

In 2012 there was a very large shipment of salt to Nukunonu of 4 pallets ‘said to contain’ 200 bags of pure salt, and each bag weighed 25kg. It is understood that this salt was for smoking and preserving fish as part of an economic development programme. Therefore the sodium imported in the three months of 2012 has been excluded from this analysis.

Over the 2008 to 2011 period (47 months 1410 days) a total of 800 000 g of sodium (800 kg) was imported both in food and as iodised salt. For the 1200 people, including children, resident at any one day this is equivalent to 0.5 grams of sodium each day for every person.

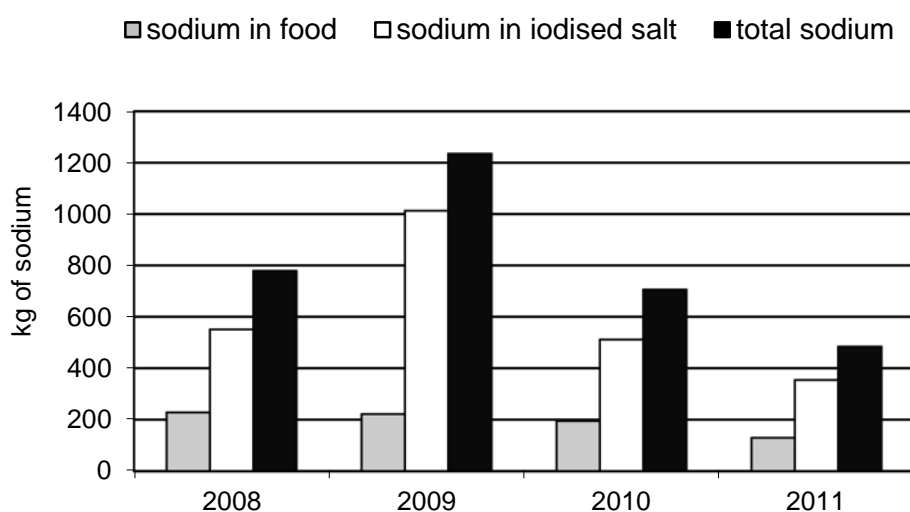


Figure 11: Total imported weight (grams) of sodium in food and as iodised salt between 2008 and 2011.

For an adult the recommended upper level of intake of sodium each day is 2.3 grams and adequate intake lies between 0.460 and 0.920 grams. Given that there is sodium in local foods and maybe from seawater, on average, there is an adequate sodium intake in Tokelau.

The estimated average requirement for iodine is 100 micrograms a day. One gram of iodised salt contains between 25 and 65 micrograms of iodine. Iodised salt therefore makes an important contribution to the iodine status of Tokelau people.

Sodium, in food and table salt, is an essential mineral yet a high intake is associated with high blood pressure. Iodised salt does provide iodine, a mineral necessary for normal brain and nervous system function and normal growth of children.

Nutrient profile of major imports

Major line-items by weight and percentage energy were analysed for their nutrient profile according to the Nutrient Profiling system⁸.

Traditionally less healthy foods are identified as those high in fat, sugar and salt. On the other hand the presence of other components can “balance” these judgements. The other components regarded as positive attributes of foods are protein, fruit and vegetable and fibre. Consideration should also be given to micronutrients such as calcium (in dairy), potassium (in bananas) and vitamin C (oranges) that add nutritional value to a food.

Cost was not considered in this report but it should be noted that while whole grains and fruit and vegetables and lean meats contain a range of vitamins and minerals in greater quantities than refined foods (rice, sugar, flour) they cost more to buy and also to store safely.

The score and rank of all foods is provided in Appendix A6.

Imported foods that contribute most to a nutritionally adequate diet:

Eggs	All vegetables
(Fish)	All fruits
Prawns	Milk
*Beef mince	Cheese

*(low fat –i.e.premium mince, better food value for money)

Imported foods high in fat, sugar or salt that contribute least to a nutritionally adequate diet.

†Sheep, lamb cuts including chops	Sausages
Pork products including ham and bacon	Biscuits
Canned corned beef	†Turkey and chicken wings
Iceblocks ⁹	Crab meat surimi

† bones and fat reduce the food and nutrient value for money

Ingredients.

⁸Food Standards Australia New Zealand (2011) *Nutrition panel calculator database 2011; explanatory notes*. Commonwealth of Australia and Food Standards Australia New Zealand, 2011.

⁹ Frozen water with sugar and flavour added

The food value of some line-items is dependent on the recipe that they will be included in or the other components of the meal that they would be added to.

High fat ingredients imported were butter and margarine and high carbohydrate ingredients were sugar, rice and white flour. Salt has been considered separately for its sodium content.

An example of a healthier rice meal would be one where 50% volume was vegetables, 25% rice and 25% protein food. Ideally there would be three vegetables of different colours to obtain a variety of micronutrients and plant food benefits. E.g. taro leaves, pumpkin and banana.

Nutrition profile of all the shipments excluding beverages

The sum of the energy and nutrients in all the shipments (excluding beverages) was assessed using the nutrition profile scoring system. The score card showed that saturated fat was high but total energy, sugar and sodium were acceptable. Protein, fibre and fruit and vegetable percentage added good points.

Limitation and barriers to healthier eating.

In general healthier, more nutritive foods cost more than refined, high fat, salt, sugar and refined foods. Ability to store the food safely is also a consideration when refrigeration is not available and the humidity and heat are high.

The ranking of foods within a food category or group using the nutrient profiling system is a useful way of looking at how recipes or formulations may be changed to increase nutrient density and value¹⁰

¹⁰Rayner M, Scarborough P, Boxer A *et al.* (2005) *Nutrient profiles: Development of Final Model*. Oxford: British Heart Foundation Health Promotion Research Group, Department of Public Health, University of Oxford.

Scarborough P, Rayner M & Stockley L (2007) Developing nutrient profile models: a systematic approach. *Public health nutrition* **10**, 330-336.

Table 12: Frequently imported foods ranked by energy and weight

Food Name	Rank by Energy (MJ)	Rank by weight (kg)
Rice	1 st (30%)	1 st (21%)
Brown sugar	2 nd (20%)	3 rd (12%)
White flour	3 rd (12%)	4 th (8%)
Chicken cuts	4 th (9%)	2 nd (15%)
Lamb pieces	5 th (7%)	6 th (6%)
Sausages	6 th (3%)	7 th (4%)
Butter	7 th (3%)	14 th (1%)
Corned/Salt beef	8 th (2%)	8 th (3%)
Potato	9 th (2%)	5 th (7%)

Either a reduction of the quantity or improvement of the quality of foods that are frequently imported and make up a large proportion of the imported food supply (Table 12) should be considered.

Local foods¹¹

Protein

Fish is abundant, readily available and eaten throughout the year. Fishing is selective for what is wanted at a particular time. Fish comprises about two thirds of the protein consumed. The *taste* of pork and other meats is preferred to fish. **Local pork** is eaten during festivities such as Christmas, New Year, village public holidays, birthdays, weddings and funerals or during a visit of a very important person. **Local chicken** were eaten at the same times as above until just before the avian 'flu (H1N1) pandemic. In response to the on-and-off deaths of local chicken the Health Department made a national call to cease the consumption of any local chicken meat. Currently local chicken is eaten only in Atafu and Nukunonu.

Carbohydrate

Breadfruit are eaten throughout the year. Two varieties of breadfruit trees alternately, at six month intervals, bear fruits. Breadfruit and rice (imported) are the most commonly eaten carbohydrate foods. **Unripe banana** is another, infrequent, form of carbohydrate.

Germinating coconut is a commonly consumed source of carbohydrate eaten in all three atolls throughout the year. Young coconut has more B vitamins and carbohydrate and less fat than older coconuts. It is around 80% water. **Pulaka** is a local form of taro which is only available in Fakaofu and Atafu and is usually eaten during periods of festivity. Carbohydrate-rich **kumala** is no longer grown.

Vegetables

"**Lu**" is the top of a local fern and is occasionally eaten and contain good quantities of vitamin A. "**Pele**" leaves, also called tree spinach are a common local vegetable and also provide vitamin A. **Pumpkin and pumpkin tops**, which contain a number of B vitamins, are occasionally added to soup.

Fruits

Pawpaw is the most common fruit and is eaten throughout the year. Pawpaw is a good source of vitamin C, equivalent to the amount found in oranges.

The ripe **pandanus fruits** are available for 4-5 months of the year and contribute vitamin C to the diet. **Ripe bananas** are eaten occasionally.

¹¹ This information about local foods that are readily available has been provided by Dr Tekie Iosefa

Recommendations

Overall the quantity and quality of the nutrients in the foods imported into Tokelau are not adequate for a nutritionally balanced diet. Cigarettes, alcohol and sugary drinks are not health promoting and are not essential supplies. Excluding these beverages the total energy imported was not adequate for the total requirements of the population and the major detractor from diet quality was the proportion of saturated fat.

This consideration of the nutritional adequacy and quality of the imported foods into Tokelau is limited by lack of information about the quantity and quality of local foods eaten, the importation by other routes of foods and beverages and no knowledge of the budget available for the importation of food. Food security is a big concern and the food availability on a daily basis should be considered. Most nutrients including energy should be consumed on a daily basis in adequate and relatively constant quantities. The reality for people in Tokelau dependent on a fortnightly shipment should be investigated further.

Recommendations to be considered by the Tokelauan people.

- The needs of the Tokelau people and the balance between imported and local foods need to be investigated further by those who best understand the reality of life in Tokelau and the dependence of health on nutrition.
- Imports should continue to be monitored and progress tracked. In consultation with the shipping company, on a yearly basis, the manifests from the ship could be analysed in a similar manner to this report and reported to the Tokelau health authorities.
- Consideration be given to developing a check list for foods that guides decisions based on:
 - ✓ availability and ranking of foods against the nutrient profile
 - ✓ cost in relation to quality of nutrients provided.
 - ✓ the practicality of leaner cuts of meat with bone removed.
 - ✓ sustainability – i.e. amount of packaging and waste that products contribute e.g. cans and bottles.
- Adopt a “thinking global and acting local framework”, following for example the GO LOCAL recommendations of the late Dr Lois Engleberger, Island Food Community of Pohnpei

Step 1: Plant some local foods

Step 2: Add some local food to your diet

Step 3: Maintain & harvest your island foods

Step 4: Be proud of your culture & foods

- **Add local to the food supply**

A celebration of local foods especially fish and ways of storing including drying. Explore further the contribution of local fish, seafoods and plants to iodine, selenium and calcium to the diet.

- **Subtract from the shipments**

Set achievable targets and systems of monitoring reduction in the import frequency and quantity of cigarettes, alcohol and sugary drinks.

Set achievable targets and systems of monitoring reduction in the amount of packaging and waste (plastic and cans) imported and ways of recycling or exporting this waste.

- **Add to the shipments**

Consider more lean, less fatty cuts of meat.

Focus on importing foods that cannot be replaced by local foods with a mind to storage and food safety.

e.g. taro and green bananas are excellent sources of carbohydrate and could replace some carbohydrate energy from sugar, rice and flour.

NB importation of animal fat (dripping) for cooking was stopped by the villages five years ago. Only vegetable oil is imported for cooking and that quantity was relatively very small.

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APPENDICES

Appendix A1 New Zealand food names used to describe imported foods and obtain nutrient composition from the NZ food composition tables.

Eighty one unique line-items were identified and matched against the New Zealand food composition table information.

General Name	No.	ID_NZ_Food	NZ Food Tables Name
Line-items			
ALCOHOLIC BEVERAGES			
Baileys liqueur	5	B1003	Liqueur, cream based
Vailima beer	263	B2	Beer, standard draught and lager
Assorted spirits: gin, rum, vodka, whisky	302	B21	Spirits, 70 proof
red wine	29	B24	Wine, red,dry
White wine	21	B26	Wine, white,dry
Kahlua	3	B39	Liqueur, coffee flavoured
NON-ALCOHOLIC BEVERAGES			
Can soft drinks	242	C17	Soft drink, lemonade
Diet soft drink	1	C25	Soft drink, `Cola`,diet
Juice	3	C38	Juice, orange & apple,unsw, `Just Juice`
Bottled water	10	C41	Water, New Zealand, bottled
Flavoured water	1	C79	Water, tonic, carbonated
CEREALS AND PSEUDO-CEREALS			
Biscuits	1	A146	Biscuits
Flour	73	E108	Flour, wheat, white, standard
Rice	68	E28	Rice, white, polished
Sago	12	E30	Sago, raw
Puff Pastry	1	R72	Pastry, flaky, uncooked

DAIRY			
Cheese blocks	35	F1001	Cheese, Edam
Butter	66	F1047	Butter, salted, Fonterra
Cheese sliced	3	F19	Cheese, processed
Whipping cream	21	F25	Cream, whipping, UHT
Ice cream	73	F28	Ice cream, vanilla, standard
Anchor milk powder	3	F37	Milk, powder, whole
Anchor long life milk	1	F43	Milk, UHT, standardised
Flavoured milk	2	F44	Milk, UHT, strawberry flavour
Eggs	74	G1008	Egg, whole, raw
FATS AND OILS			
Margarine	31	J1005	Margarine, Poly, 70% fat
Cooking Oil	1	J30	Oil, vegetable, blend, salad & cooking
SEAFOOD			
Cutlet Prawn	2	H94	Prawn cutlets (NZR)
Frozen Fish	1	K28	Hoki, flesh, raw
FRUIT			
Pears	6	L1015	Pear, assorted variety, flesh & skin, fresh
Rock Melon	1	L106	Rock Melon
NZ Oranges Oranges	61	L114	Orange, flesh, fresh
Local Pineapples	1	L144	Pineapple, flesh, fresh
Lemons	4	L183	Lemon, flesh, fresh
Breadfruit	1	L189	Breadfruit, boiled
Apples	61	L212	Apple, flesh, fresh
Aufai:green bananas	12	L32	Banana, flesh, fresh

MEAT			
Corned beef, salt beef	87	M10	Beef, corned beef, canned
Mince meat	30	M1026	Beef, mince, raw, 7% fat
Bacon	29	M108	Pork, bacon, lean&fat, uncooked
Ham leg (small)	8	M124	Pork, ham
Assorted lamb pieces	67	M149	Lamb, ribloin chop, lean&fat, trimmed, raw
Steak	6	M188	Beef, blade steak, l&f, trm, stewed, drained
Assorted beef	2	M225	Beef, mince, lean&fat(20%), raw
Whole beast	2	M8	Beef, comp cut, subcutaneous fat, raw
Chicken leg	7	M362	Chicken, drumstick, lean, fat & skin, raw
NZ Steak	6	M37	Beef, sirloin steak, lean, raw
Turkey wings	18	M384	Turkey, wing, lean and fat, raw
Chicken pieces	78	M393	Chicken, composite cuts, lean & fat, raw
Steak topside/rump	9	M399	Beef, rump steak, lean(80%) & fat, raw
Steak,Bacon,Ham	1	M619	Pork, bacon, rashers, lean & fat, grilled
Mutton flaps	4	M622	Sheep, mutton, comp cuts, seperable fat, raw
Lamb necks	3	M629	Sheep, lamb, neck chops, lean, raw
Pork trotters sliced	21	M94	Pork, leg roast, lean & fat, raw
Crab meat	5	T40	Crab meat stick, imitation, surimi
Prawns (Raw) king size	2	T41	Prawn, king, raw
MEAT PRODUCTS			
Chicken franks	2	N29	Sausage, chicken luncheon
Assorted sausages	75	N62	Sausage, fresh, raw, asst meats & flvrs
Ham sandwich	2	N65	Ham, sliced, sandwich

MISCELLANEOUS

Cigarettes	63	na	Cigarettes
Pure salt	1	P10	Salt, table
Iodised fine salt	39	P81	Salt, iodised, table
Brown sugar	52	W19	Sugar, Brown
Sugar	16	W24	Sugar, White
Ice blocks	6	W31	Ice block
Icing sugar	5	W32	Sugar, Icing
Potatoes	71	X100	Potato, comb.cultivars, flesh, raw
Tomatoes	4	X1006	Tomatoes, assorted variety, flesh, skin and seeds, raw
Carrots	59	X1007	Carrot, raw
Lettuce	1	X1009	Lettuce, assorted variety, heart, fresh
Pumpkins	53	X108	Pumpkin, Kumi Kumi, flesh, raw
Cawarra	1	X132	Yam, flesh, boiled, drained
Mixed vegetables	37	X156	Vegetables, 3 mixed, frozen, uncooked
Taro	26	X161	Taro, combined cultivars, raw
Cassava	2	X238	Cassava
Head cabbages	66	X29	Cabbage, White, inner and outer leaves, raw
Corn on cob	18	X42	Corn, Sweet, comb.cultivars, frozen, frozen
Cucumber	8	X45	Cucumber, flesh, raw
Onions	69	X66	Onion, flesh, raw
Frozen peas	1	X81	Peas, Green, frozen, uncooked
Frozen potato chips	4	X95	Potato, fries, frozen, uncooked

Appendix A2 Food categories from the New Zealand food composition tables

NZ food category	NZ food category name
A	Bakery products
B	Beverages, alcoholic
C	Beverages, non alcoholic
D	Breakfast cereals
E	Cereals and pseudo-cereals
F	Dairy
G	Eggs
H	Fast foods
J	Fats and oils
K	Finfish
L	Fruit
M	Meat
N	Meat products
Not food	Not food
P	Miscellaneous
Q	Nuts and seeds
R	Recipes
S	Sauces and condiments
T	Shellfish
U	Snack foods
V	Soups
W	Sugar confectionery and sweet spreads
X	Vegetables
Z	Cigarettes

Appendix A3 Table of assumptions made to derive quantities of food shipped.

*with reference to Ah-Liki-Wholesale-Shopping website

NZFoodfile	Food name on manifest	Assumption
	Anchor Milk Powder	Milk powder 30 kg carton
	Butter	Anchor Butter 1 carton 20x450gms
	Lamb Pieces	Lamb 20kg carton
	Assorted Lamb Pieces	lamb pieces 441b 20kg cartons
	Aufai Misiluki	Banana bunch half fruit then 60%
	Bacon	Bacon 1 box 12pkts x 16oz
	Assorted Beef	Beef 1 carton 30 lb
	Assorted Soft Drinks	One pallet 100cc 24x355mls
	Canned Soft Drinks	960 cans in a pallet, 355 mL/can
	stc:25ctns Soft Drinks x 2ltr	Soft drink 2 litre assumed 8 in ctn
	Assorted Goods	not food
	Frozen Baby Carrots	Baby carrots 12 x 0.5kg
	Cheese	Cheese 1 case 10 x 2kg blocks
	*Chicken Leg 1/4	Chicken legs 1 case =33lb=15kg
	Drumsticks	Chicken 15kg carton
	Chicken Pieces	Chicken pieces 1 carton=15kg
	Assorted Chicken Pieces	Chicken pieces I carton =15kg
	Cooking Oil	Cooking oil 1 carton=12x1L
	Corn on Cob Frozen	Corn on cob 12 x 500g packets
	Cucumber	1 bag of cucumbers=20 packets
	Cucumber	1 cucumber 240-300g - 1 pkt 1.25 kg
	Eggs	1 egg=50g edible
	Eggs	Eggs 20Doz/ctn
	Corned Frozen 12 x 500gm	Corn Frozen 12 x 500gm
	Frozen Chips	Frozen chips one carton 15kg
	Leg Ham	Ham 1 ctn =2 x 2kg
	Ham Sandwich Local	1 pc ham 2kg

Ham Sandwich	2kg pack Carton 2 x 4pack
Ham Sandwich Local	Ham Roll =3.5kg
Head Gabbages 4 bags	1 bag cabbage 10kg?
Head Cabbage	ctn cabbage 20 kg
Head Cabbage x 10kg	Head Cabbage x 10kg
Ice Cream	Density icecream 1 litre =572g
Ice Cream	Ice Cream 9x2ltr Tip Top
Juice	Juice 1 pallet 20 cartons*12litre
Khalua	Kahlua 12 x 1ltr
Lamb Chops	Lamb chops carton 20 lb
Lamb Necks	Lamb Necks carton 20 lb
Lemons x 20pkts	1 lemon 58g 2kg/pkt
Margarine	Margarine carton 24x500gms
Mince Meat	Mince Meat 12 x 1lb pkt
Mixed Veges	Mixed Veges carton 12 x 500gm
Monosodium 10 x 450g	Not food?
NZ Orange x 38lbs	NZ Orange one carton 38lbs
NZ Steak	NZ steak assume carton 100 lb
Onion	Onions x 20kg bag
Pacific Corned Beef	assumed 1lb cans
Cigarette	1 carton 10000 cigarettes i.e. 50 x 10 x 20 cigarettes
Pork Trotters	Pig Trotters Sliced x 40lbs
NZ Potatoes x 20kg	Potatoes x 20kg
Puff Pastry	Puff pastry 10kg /pkt
Pumkin	Pumpkin 20kg bag
Salt Beef	Corned beef one carton 12 x 454g
Salt Beef	Carton 10kg
Palagi Taro	1 bag Taro 100kg
Tauaga	not edible
stc:50 Tauaga	not edible

NZ Tomatoes	Tomato 1 ctn 30kg 1 tomato =127g
stc:30pkts NZ Tomatoes	1 pkt tomato 0.5kg
Cossack Vodka	Cossack Vodka 12 x 1125mls
Whole Beast	one third waste
*Sausages	12 pks (10.5lb) case =4.7kg
*Chicken franks	24 x 1 lb case
Biscuits	1 pail biscuits 5kg semi sweet
Cawarra	Type of local yam
Frozen Fish	1 bag fish =15 kg
Frozen Peas	Peas 12 x 1kg bags
Crab Meat Flakes	1 carton crab=10kg
Steak,Bacon,Ham	Carton meat assume 41 lb
Gasava x 10kg	1 bag cassava 100kg
Ice Blocks Popsicles	1 ctn iceblocks 10 x 30 units
stc:100 Doz Ice Blocks	1 iceblock 80g

Appendix A4 Proportion of foods that was considered edible

Food	Edible proportion ¹²
Apple	75%
Banana	64%
Breadfruit	80%
Cabbage	90%
Carrot	80%
Cassava	75%
Chicken, composite cuts	85%
Chicken, drumstick	75%
Chicken, wing,	40%
Corn, sweet	88%
Cucumber	80%
Lamb chop	40-50%
Lemon	45%
Lettuce	75%
Onion	90%
Orange	65%
Pear	80%
Pineapple	45%
Pork, ham	70%
Pork, leg	40%
Potato	80%
Prawns	60%
Pumpkin	75%
Rock melon	55%
Sheep, lamb, neck chops	40%
Taro	80%
Tomatoes	99%
Turkey, wing	50%
Yam	80%

All other foods were considered 100% edible

¹²Brown A (2011) *Understanding food: principles and preparation*. 4th ed. Belmont, CA: Wadsworth Cengage

Appendix A5 Calculation and application of nutrient profile score

To calculate a food score use the following steps:

Step 1: To calculate baseline points the nutrition information concerning quantity of the following nutrients per 100 g/100 mL of the food product is required:

- Average **energy** (kilojoules);
- Average **saturated fat** (g);
- Average **total sugars** (g); and
- Average **sodium** (mg).

Step 2: To calculate V, P and F points the proportion and weight the food product is required:

- Percentage of the **fruit, vegetable, legume and nut** component
- Average **protein** (per 100 g or 100 mL); and
- Average **dietary fibre** (per 100 g or 100 mL).

Step 3: Determine if a food meets the scoring criteria:

Points	Total baseline points (100g or 100mL)				V Points (fruit, veges, legume &nuts)		P points	F points
	Energy kJ	Sat Fat g	Sugars g	Sodium mg	Conc %	Dried %	Protein %	Fibre %
0	≤335	≤1	≤4.5	≤90	<25	≤40	≤1.6	≤0.9
1	>335	>1	>4.5	>90	≥25	>40	>1.6	>0.9
2	>670	>2	>9	>180	≥43	>60	>3.2	>1.9
3	>1005	>3	>13.5	>270	≥67	>80	>4.8	>2.8
4	>1340	>4	>18	>360			>6.4	>3.7
5	>1675	>5	>22.5	>450			>8	>4.7
6	>2010	>6	>27	>540				
7	>2345	>7	>31	>630				
8	>2680	>8	>36	>720				
9	> 3015	> 9	> 40	> 810				
10	> 3350	> 10	> 45	> 900				

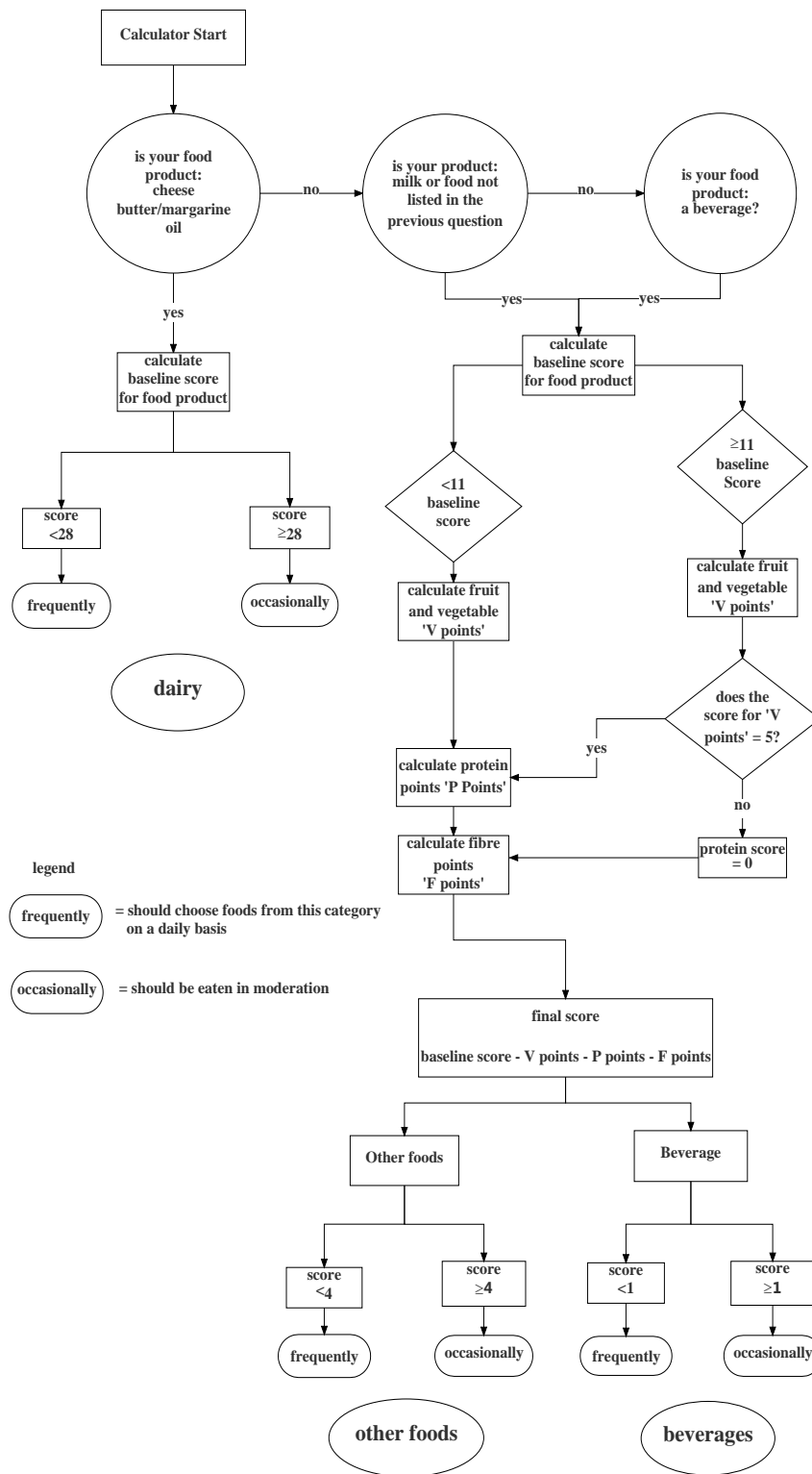
Final Score=Total baseline points minus (V points) minus (P points) minus (F points)
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A **food** is classified as “less healthy” where it scores **4 points or more**.

A **drink** is classified as “less healthy” where it scores **1 point or more**

A **dairy product** is classified as “less healthy” where it scores **28 points or more**

A1–Health Claims Nutrient Profiling Calculation Steps¹³



¹³ adapted from

<http://www.foodstandards.govt.nz/industry/claims/pages/nutrientprofilingcalculator/Default.aspx>

Appendix A6 Foods ranked by nutrient profile score

The healthier foods which would be eligible for a health claim included good sources of protein and all fruits and vegetables and some dairy. The least healthy food were either high in fat, sugar or salt. The nutrition profile of foods that increase volume on cooking – rice and sago were assessed based on their composition when cooked.

The calculation in Appendix A5 was used to rank all the imported foods from least healthy (highest scores) to most healthy (lowest scores)

Pork, bacon, lean&fat, uncooked	18
Pork	17
Beef, corned beef, canned	14
Ice block	14
Sugar, brown	14
Sugar, icing	14
Sugar, white	14
Sheep, mutton, comp cuts, separable fat, raw	13
Cream, whipping, UHT	12
Ice cream, vanilla, standard	11
Sausage, fresh, raw, asst meats & flvrs	10
Biscuits	8
Pork, ham	8
Beef, mince, lean&fat (20%), raw	7
Beef, rump steak, lean (80%) & fat, raw	7
Ham, sliced, sandwich	7
Lamb, ribloin chop, lean & fat, trimmed, raw	7
Turkey, wing, lean and fat, raw	7
Crab meat stick, imitation, surimi	5
Pork, leg roast, lean & fat, raw	5
Beef, blade steak, l & f, trm, stewed, drained	4
Sausage, chicken luncheon	4
Chicken, wing, lean, fat &sk in, raw	2
Chicken, drumstick, lean, fat & skin, raw	1
Hoki, flesh, raw	1
Milk powder - reconstituted	1
Milk UHT	1

Sago, cooked	-1
Beef, mince, raw, 7%fat	-1
Egg, whole, raw	-1
Prawn, king, raw	-1
Banana, flesh, fresh	-2
Beef, sirloin steak, lean, raw	-2
Chicken, composite cuts, lean & fat, raw	-2
Pastry, flaky, uncooked	-2
Carrot, raw	-3
Chicken, breast, lean & fat, raw	-3
Rice, white, polished	-3
Flour, wheat, white, standard	-4
Rock melon	-4
Cucumber, flesh, raw	-5
Orange, flesh, fresh	-5
Cassava, boiled	-6
Onion, flesh, raw	-6
Pineapple, flesh, fresh	-6
Tomatoes, assorted variety, flesh, skin and seeds, raw	-6
Breadfruit, boiled	-7
Lettuce, assorted variety, heart, fresh	-7
Pear, assorted variety, flesh & skin, fresh	-7
Apple, flesh, fresh	-8
Potato, comb. cultivars, flesh, raw	-8
Potato, fries, frozen, uncooked	-8
Pumpkin, Kumi Kumi, flesh, raw	-8
Corn, Sweet, comb.cultivars, frozen, unckd	-9
Lemon, flesh, fresh	-9
Taro, combined cultivars, raw	-9
Yam, flesh, boiled, drained	-9
Vegetables, 3 mixed, frozen, uncooked	-10
Cabbage, white, inner and outer leaves, raw	-12
Peas, green, frozen, uncooked	-13