

Explanatory note for the rebase of the Consumer  
Price Index using the Household Income and  
Expenditure Survey 2021

Tonga Statistical Department  
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## Acknowledgment

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The CPI report January 2025 and explanatory note was prepared by staff members of the Real Sector team of the Economic Statistics division. The Department gratefully acknowledges the work done by the staff of this team as well as contribution made by the staff members of team within the division.

Tonga Statistics Department would welcome any comments and suggestions for future improvement of the contents of the report and the explanatory note. Please contact the Economics Statistics Division, TSD at this address: P.O. Box 149, Nuku'alofa, Tonga; by telephone (676) 23-300; Fax (676) 24-303; email [dept@stats.gov.to](mailto:dept@stats.gov.to) for any queries.

  
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## Summary

This report summarises the work done on rebasing the years of the Consumer Price Index for Tonga. The present CPI report uses the new weights derived from the expenditure shares of HIES 2021. Both the new and old weights are compared in this explanatory note. The CPI basket has been updated, and 46 new products have been added to it. These were derived from the consumption pattern and weights allocated to products seen in the HIES 2021.

A Consumer Price Index (CPI) is designed to measure the changes over time in general level of retail prices of selected goods and services that households purchase for the purpose of consumption. Such changes affect the real purchasing power of consumers income and their welfare. CPI numbers are widely used as macroeconomic indicator of inflation, and as a tool by government and central banks for targeting inflation and monitoring price stability. CPI is also used as deflators in the National Accounts. Therefore, CPI is considered as one of the most important economic indicators.

The Tonga Statistical Department with the help of the Statistical Innovation and Capacity Building in Tonga Project (PACSTATS) of the World Bank decided to hire a consultant for rebasing the CPI. Dr. Marcus Scheiblecker was chosen and hired as the consultant for this mission. The mission lasted six months from 16<sup>th</sup> January 2024 to 14<sup>th</sup> June 2024. The work done during the mission was 97 days remotely and 75 days in country.

This report contains four sections. The first section on introduction and background gives a history and rationale behind the need for rebase of the CPI by the Tonga Statistics Department (TSD). The second section compares and analyses the old and new weights of the CPI 2018 and CPI 2021 respectively. The third gives a summary statistic of the products added to the basket and the products removed from the CPI 2021 basket. The report ends with a section on frequently asked questions (FAQs). The report also includes an Annex table which has the complete list of items in the CPI 2021 basket of products<sup>1</sup>.

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<sup>1</sup> For the purposes of this report, products in a CPI basket refer to both goods and services.

## Introduction and background

The Consumer Price Index (CPI) report is published monthly by the TSD and is accepted as the official measure of inflation in Tonga. It measures the changes, over time, in prices of a fixed basket of goods and services which are representative of the consumption pattern of households in Tonga. This in turn can be used to assess the changes in living standards and the purchasing power of money in the economy. The selection and relative importance of the goods and services (weight) in the CPI basket represents the overall expenditure pattern of households in Tonga. These weights are generally derived from the Household and Expenditure Survey (HIES) conducted by the department every five years.

Going back, the most recent CPI rebase, and reference period was September 2018=100. This was based on the HIES 2015-2016 results, which included 137 items in the Tonga baskets of goods and services, organized into 12 major groups. Before that, the CPI rebase and reference period was November 2002=100, using data from the HIES 2000/2001, which contained 222 items in the basket, classified into 7 major groups. In 2024, TSD successfully completed its re-weighting of the Consumer Price Index based on the results of HIES 2020/2021 with a reference period of September 2021= 100. The current CPI basket contains 161 items (Table A 1). The CPI team of TSD does weekly market price survey for products available in Talamahu and roadside markets, and monthly store price survey for products available in stores both in the region of Tongatapu and Vava'u. The information collected in these surveys is used by our price statisticians to compute the monthly CPI indices.

### Rationale

It does not take very long before an index becomes out-of-date because the weights no longer reflect true pattern of expenditure and new products come in the market that did not exist before. Therefore, any index number series must be updated through a process of 're-basing'. The re-basing of any indices is necessary due to the demand for more accurate, reliable and credible measure especially when the rate of inflation needs to be monitored. While re-basing we should consider formulae utilized for calculating CPI; frequency of weights updates; procedures for quality adjustment and introduction of new goods and new outlets; sampling methods applied; use of one single index for many different purposes.

The TSD team with support of the PACSTATS World Bank Project team decided to hire Dr. Scheiblecker as the consultant who would use the expenditure shares of the HIES 2021 as weights to rebase the CPI 2018 to CPI 2021. However, before such expenditure shares can be used as weights for CPI compilation, their plausibility must be checked. As the weight base year of the HIES 2021 has been struck by extraordinary effects (Covid-19 pandemic), further adjustments were necessary in order to render weights as an appropriate basis for price measurement for years after 2021.

When an appropriate set of weights are decided there are usually new products to be included in this set, for which no price information has been collected so far. This leads to issues in the calculation of not only the index which cannot start in the base year 2021 (as time for processing and evaluating the HIES data is needed), but also that a back cast of the index for the year prior to the HIES survey, which becomes necessary. In order to alleviate this problem, the price relatives of products similar to those of the new products have to be found for which price surveys have been performed in the past.

Another issue is the time delay of using the HIES for CPI production, weights derived from HIES data will already be outdated when being used for the first time for CPI calculation. Ideally, the price base year<sup>2</sup> and

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<sup>2</sup> The year in which the prices, of goods and services consumed, are taken as base price that is the CPI = 100.

weight base year<sup>3</sup> should be identical so that prices are collected of those which belong to the basket of consumers in the true sense. It is not always possible to have both the base years identical, but it is desirable to minimize the gaps between these two. In Tonga, we go around this issue by treating these weights as if they would stem from the price base year. In this case – where the weights' base year will be regarded as the price base year – the emerging index is called a Young index. An alternative approach is to price update the weights surveyed in 2021 to the new price base year which is 2024. Doing this, higher shares arise for products which prices have risen stronger between the survey year and the derived new base year. The shortcoming of this approach is that it disregards substitution possibilities of consumers by switching to other products or by consuming less quantities of the product which became more expensive. An index based on price updated weights to the price reference year is called a Lowe index. Following the recommendation of the consultant, it was decided that the Lowe approach will be followed only where the demand for certain products is affected by the COVID – 19 pandemic. In all other cases, the analysis will follow the Young index approach. This means that for expenditure on international flights, a price update of the HIES 2015 weight for international flights to the year 2023 is done, as this reflects a better weight for current price measurement as the one reported the HIES 2021.

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<sup>3</sup> The year in respect of which the data of consumer expenditure was used to compute weights for aggregating elementary indices to compile higher level indices.

## Comparison and analysis

Figure 1 Annual inflation rate for old and new weights

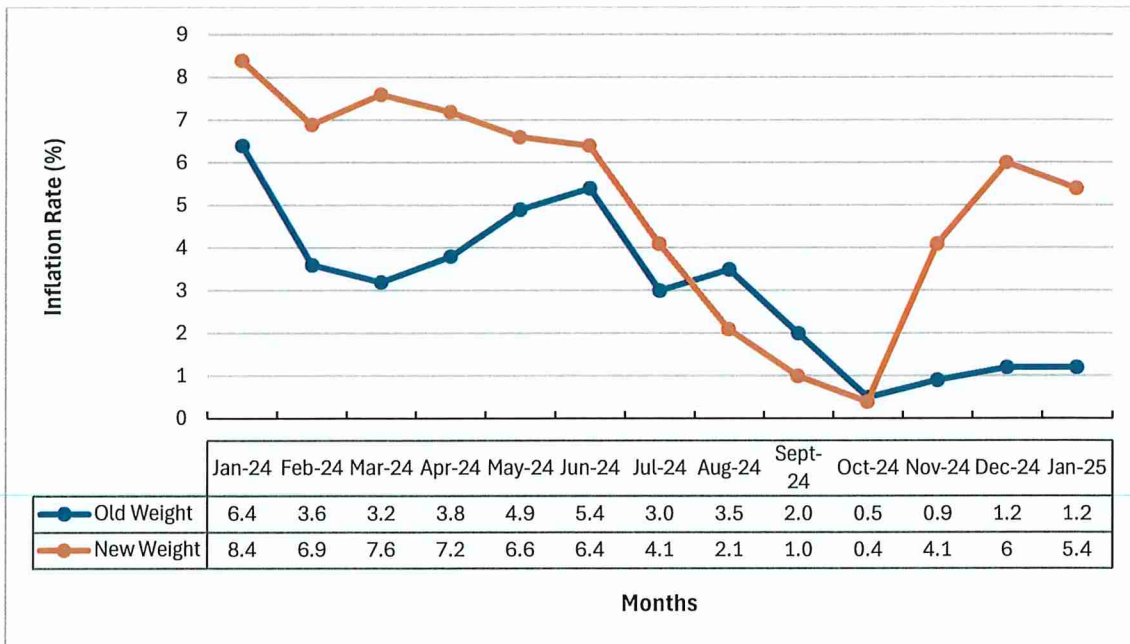
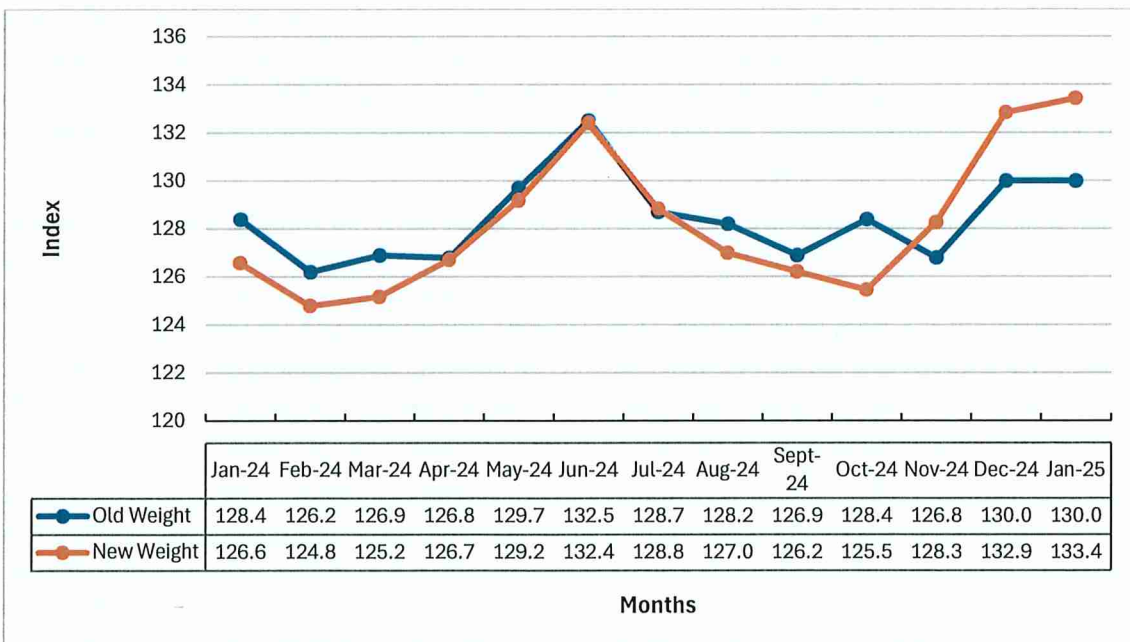


Figure 2 CPI index using old and new weights



The CPI has its weights of specific goods and services included in the consumption basket, and the basket itself, is reviewed or updated to better reflect the current consumption pattern of households. Since the preferences of households change over time with the introduction of new consumer goods and services in the market, the CPI basket (weights) are rebased to ensure that the country's CPI stays relevant and current for its intended purpose so it can maintain its relevance and accuracy.

Figure 1 and Figure 2 show the comparison between the old (CPI 2018) and new (CPI 2021) weights for Annual inflation and CPI indices over the past twelve months. We believe the spikes in the graphs show the seasonal hike in prices during the festive seasons. We identified May and June to be the months for price hikes due to the Church conference, Whale-watching season, and other events like King Tupou VI's birthday celebration and Heilala festival. The price increases observed in November and December can be attributed to the Christmas and New Year celebrations, as well as the commencement of the new school term. This trend was seen in the past two years.

### New Weights

To derive the new weighting pattern, the September 2018 base index was updated to reference September 2021. A new index, with the reference period set to 2021 = 100, will be compiled and linked to the updated index, creating a continuous series beginning in January 2023. As the new weights are implemented starting in January 2023, their impact will first be seen in the February 2023 index, with subsequent months also reflecting this change.

Both the re-referencing (adjusting the time reference base of the historical series) and the linking of the new series to the old one do not affect month-to-month or year-to-year index movements. However, due to rounding, a maximum difference of 0.1% may arise between some of the old and new estimates after re-referencing. The index levels based on the 2021 reference period are consistently and proportionally lower than those based on the 2018 reference period because of the shift from the 2018 to the 2021 base.

All product subgroups surveyed in the HIES 2021 have been recorded from PACCOICOP 2012 to the PACCOICOP 2020 classification, keeping the more detailed TSD product names as well as their description. Products with a HIES 2021 expenditure share of less than 0.15% in total consumption expenditure (excluding imputed rent) were excluded from in the new CPI. Nevertheless, for some items, the TSD has decided to keep them for the sake of simplicity to survey them or their weights are adjusted above the threshold during the process of plausibility or adaptation tests. Two PACCOICOP groups were excluded from the CPI 2021 because these products represent investment expenditure in most cases and as a rule should be excluded from the CPI.

Several new products have been introduced in the CPI basket 2021, this naturally brings the question of extending the price data for these products in the past. The TSD, as recommended by the consultant, followed the common practice in price statistics to extend these series by applying growth rates of the past, of products which can be assumed to show similar price developments and have already been surveyed in the old CPI 2018. For example, the price development of brown coconut has been used to calculate the index of green coconut from its reference period (i.e., September 2021) forward and backwards, and for cheese, the price survey of butter has been used.

However, for some new products, no appropriate price substitute could be found in the list of items of the old CPI. In this case, the respective price relatives were taken from the CPI of Tonga's most important trading partner, Australia. These data were taken from the website of the Australian Bureau of Statistics. These statistics informed the positions of Cars, Spare parts, Cell phones, and Wine and converted into TOP by the exchange rate between AUS<sup>4</sup> and TOP<sup>5</sup> as published on a monthly basis by the National Reserve Bank of Tonga (NRBT). The disadvantage of using this method arises from the impact of monthly exchange rate fluctuations, which affect not only the elementary indices of these products but also the new CPI for the months prior to July 2024. *We would like to take this opportunity*

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<sup>4</sup> AUS – Australian Dollars

<sup>5</sup> TOP – Tongan Pa'anga



to inform our users to take caution in interpreting and using the CPI numbers for months and years before July 2024.

Table 1 CPI Weights Comparison (2018 vs 2021)

Division Code (PACCOICOP)	Old weight %	New weight %	Absolute change %
Food and non-alcoholic beverages	39.75	42.61	2.86
Alcoholic beverages, tobacco and narcotics	11.60	5.60	-6.0
Clothing and footwear	2.08	2.84	0.76
Housing, Water, Electricity, Gas and other fuels	10.84	6.63	-4.21
Furnishings, household equipment and routine household maintenance	3.20	3.17	-0.03
Health	0.33	0.17	-0.16
Transport	16.41	13.18	-3.23
Information and Communication	5.16	3.66	-1.5
Recreation, Sport and Culture	1.06	0.65	-0.41
Education services	2.21	1.21	-1.0
Restaurants and Accommodation services	3.11	14.95	11.84
Personal care, social protection and Miscellaneous goods	4.24	5.35	1.11
TOTAL	100	100	

There is a large absolute increase in the weights for the Restaurants and Accommodation Services group, making it the second most significant group of the whole CPI after the Food and non-alcoholic beverages group (Table 1). This change in weights is a reflection of changing consumption patterns of households in Tonga. Three expenditure categories, surveyed for the first time in HIES 2021, *Lunch away from home*, *Dinner away from home* and *Breakfast away from home*, were combined into the category *Takeaway food*. The CPI 2018 only had one category, *Takeaway food*, and hence, for ease of data collection, the position was kept the same for CPI 2021. Another reason for the increase in expenditure and resulting weights on Takeaway food could be due a change of survey method from dairies to recall questions. Our consultant noted that a study conducted by Food and Agriculture Organization (FAO)<sup>6</sup> reported similar results in all Pacific countries.

The consultant also made sure that erosion of weights due to the increase in Restaurant and Accommodation services group weight does not adversely affect other groups. The weights were adjusted in line with the import volumes of certain products while being careful not to exceed the total expenditure over income for the total population of Tonga in 2021, the year of HIES 2021.

<sup>6</sup> Experience in measurement of food consumption away from home in the Pacific region. <https://openknowledge.fao.org/server/api/core/bitstreams/aaa3f8e2-9369-4f5f-9bef-c5bb319a1f8b/content>

Table 2 CPI weights divided by imported and local goods for CPI 2018 and CPI 2021

Division Code (PACCOICOP)	Old weights (2018) %		New weights (2021) %		Absolute change %	
	Imported	Local	Imported	Local	Imported	Local
Food and non-alcoholic beverages	24.55	15.2	25.07	17.54	0.52	2.34
Alcoholic beverages, tobacco and narcotics	4.88	6.73	1.95	3.65	-2.93	-3.08
Clothing and footwear	1.72	0.35	2.84	0	1.12	-0.35
Housing, Water, Electricity, and other fuels	3.6	7.24	1.72	4.9	-1.88	-2.34
Furnishings & household equipment	2.36	0.85	3.01	0.16	0.65	-0.69
Health	0.17	0.16	0.05	0.12	-0.12	-0.04
Transport	12.97	3.44	10.78	2.4	-2.19	-1.04
Information and Communication	0	5.16	0.5	3.16	0.5	-2
Recreation, Sport and Culture	1.06	0	0.65	0	-0.41	0
Education services	0	2.21	0	1.21	0	-1
Restaurants and Accommodation S.	0	3.11	0	14.95	0	11.84
Personal care, S. pro.& Miscellaneous goods	3.74	0.5	4.86	0.49	1.12	-0.01
<b>Total</b>	<b>55.06</b>	<b>44.94</b>	<b>51.43</b>	<b>48.57</b>	<b>-3.63</b>	<b>3.63</b>

## Summary statistics on changes in CPI basket 2021

### New Products

The threshold for the expenditure weight of a commodity in HIES to be included in the new CPI index was set to 0.15%. The threshold was set at this level keeping in mind the current capacity of the TSD CPI team. The HIES 2021 suggested the inclusion of 46 new products in the new CPI. Consumption expenditures on cars, vans, cell phones and cosmetic fragrances are noted to be included for the first time in the CPI. Some products like batteries, salt, turkey tails, non-prescription medicines etc. which were included in the HIES 2021, did not reach the threshold of a consumption share of 0.15%. Some of these excluded products nevertheless entered the new index as their weight were close to the threshold and their prices easy to be survey. This also helped to keep important PACCOICOP divisions like *Health* to continue to be represented in the CPI 2021. The division *Health* (PACCOICOP 2020) retained the products '*non-prescription medication*' and '*doctor, hospital*' in the CPI 2021 basket as their combined expenditure weight was above the threshold.

Table 3 The products added to the CPI basket of products using the HIES 2021

Biscuit sweet (chocolate)	Car battery
Cheese	Brake pad
Peanut butter	Parcel delivery
Lemons	Pet feed
Tomato sauce	Service for cars
Coconut cream	Car rental
Coconuts (Green)	Bathroom & toilet bowl cleaner
Papayas	Broom
Ripe banana	Sponge
Breadfruit	Microwave oven
Cucumber	Trousers (men)
Pele leaves	School uniform for boys
Kape	Shorts (men)
Green Banana	Skirt (women)
Mixed string fish	Dress (women)
Sea urchin	Shoes (men)
Crab	Shoes (women)
White wine	Body oil
Kerosene	Perfume
Cell phone - new	Hairdressing
Car new	Coffee
Van new	Pizza
Car tyre	Kentucky chicken

Table 4 The products excluded from the CPI 2021 basket

Candies / Lollies	Tea bags
Condensed milk	Salt
Soy sauce	Electric batteries
Buns	Turkey tails
Vasuva/Clams	Curry powder
Iron roofing	Timber
Cement bag	Garbage disposal
Tyre repair	Batteries
Domestic call bundle	Home internet
Passport	International call bundle
Visa	Birth Certificate

## Frequently Asked Questions

Q1. Why the need for a rebase of the consumer price index?

*The CPI basket of goods needs to be rebased to reflect the current consumption pattern, improve accuracy of the index, make better informed monetary and fiscal policy decisions and have an international comparability for facilitating global economic analysis.<sup>7</sup>*

Q2. What is the difference between the old CPI and the new CPI? What are the new products?

*The new CPI is based on the expenditure share of products measured in the Household Income and expenditure survey 2020/2021. The price base year has also been kept as 2021. The old CPI has less products in the basket compared to the new basket of goods. The new products are listed in*

Table 3.

Q3. Why do we calculate monthly and annual CPI and what is the difference between them?

*Monthly CPI is useful for short-term analysis and immediate policy responses, while annual CPI provides a long-term perspective on inflation trends. Monthly CPI measures the change in process from one month to the next. It provides a snapshot of inflation over a short period, helping to detect immediate price changes and seasonal effects. While the annual one measures change in prices over a year, comparing the current month's prices to the same month in the previous year. It is less affected by short term fluctuations and provides long term perspectives of inflation trends.<sup>8</sup>*

Q4. What is Average Annual inflation?

*Average annual inflation measures the percentage change in the price level of a basket of goods and services over a year. It is calculated by averaging the monthly inflation rates over a 12-month period.*

Q5. What is PACCOICOP?

<sup>7</sup> Consumer price index manual : concepts and methods <https://www.imf.org/-/media/Files/Data/CPI/cpi-manual-concepts-and-methods.ashx>

<sup>8</sup> Australian Bureau of Statistics, Explanatory Notes <https://www.abs.gov.au/methodologies/consumer-price-index-australia-methodology/dec-quarter-2024>

*The Pacific Classification of Individual Consumption According to Purpose (PACCOICOP) is a regional classification system used to categorize goods and services purchased by individuals and households in the Pacific Island countries and territories (PICTs). It is derived from the United Nations' Classification of Individual Consumption According to Purpose (COICOP) but includes additional information relevant to the Pacific region. It includes 14 main categories and covers a wide range of goods and services consumed by households in the Pacific Island countries and territories.<sup>9</sup>*

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<sup>9</sup> Statistics for Development Division, Pacific Community <https://sdd.spc.int/news/2020/07/07/PACCOICOP-2020>

## Annex

Table A 1 List of all items in the CPI basket 2021 using the HIES 2021

White rice	Electricity	Salted beef
Plain flour	LP Gas	Pork
Bread	Service for cars	Mutton flaps
Breakfast cracker	School shorts (boys)	Chicken legs
Biscuit sweet (chocolate)	School shirts (boys)	Chicken wings
Noodles	T- Shirts (men)	Corned beef
Weetbix	School shirts (girls)	Milk
Chuck beef (pulu aisi)	Pingiako	Powdered milk
Cheese	Baby clothes	Coconut cream
Eggs	Silipa (flip flops)	Milo
Butter	Shoes (woman)	Dishwashing liquid
Orange	Beds	Detergent
Onions	Mat	Bathroom & Toilet bowl cleaner
Ice cream	Water bill	Mosquito coils
Peanut Butter	Mobile Data bundle	Aluminium foil
Mayonnaise	Cell phone – new	Pet feed
Tomato sauce	School uniform for boys	Toothpaste
Deodorant	Shoes(man)	Cigarettes (imported)
Body oil	Air fare (international)	Cigarettes (local)
Whiskey	Taxi	Tongan Tobacco
Rum	Bus fare	Skirt (women)
Vodka	White wine	Dress(women)
Beer- imported	Beer-local	Trousers (men)
Beer- local	Exercise book	Shorts(men)
Sausages	Stationary	Infant formula
Hot dogs	Parcel delivery	Drink power
Canned mackerel – oil	Primary school fees	Broom
Canned mackerel – tomato	Secondary school fees	Sponge
Cooking oil	Tertiary school fees	Bongos
Raw sugar	Steak	Instant Coffee
Twisties	Kava	Diapers
Bottled water	Perfume	Cake
Bath soap	Ferry services	Microwave oven
Shampoo	Freight services	Refrigerator
Toilet paper	Car tyre	Washing machine
Hairdressing	Labour cost	Tuna – yellowfin(fresh)
Domestic helper	Paint	Hakula Puaka (Fresh)
Petrol	Apples	Palu (Fresh)
Diesel	Panadol	Reef fish – fua/kanaha(fresh)
Kerosene	Doctor visit	Reef fish – pa'aua (Fresh)
Vehicle inspection	Car rental	Octopus
Car license fee	Car new	Cockles, pips

Driving license fee	Van new	Sea urchin
Vehicle registration fee	Car battery	Lobster
Air fare- domestic	Brake pad	Coconuts (brown)
Suckling pig	Taro leaves	Watermelon
Pepper- capsicum	Taro: dryland	Yams: late
Carrots	Taro: wetland	Sweet potatoes
H/Cabbage	Yams: early	Cassava – manioke
Tomatoes	Lemon	breadfruit
Mixed string fish	Ripe banana	Cucumber
Coconut- green	Green banana	Pele
Papaya	Pizza	Kape
Kentucky	Bank fees	

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