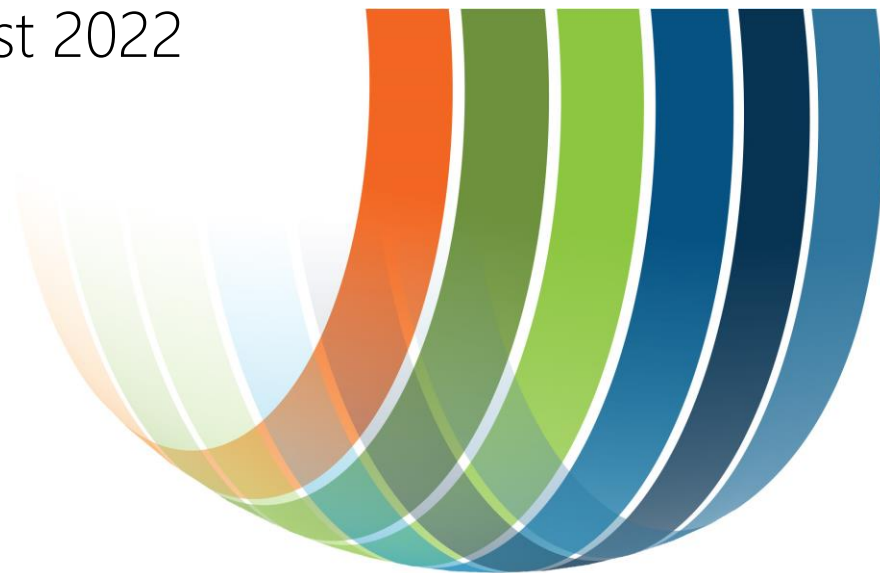


# Infometrics-Foodstuffs NZ Grocery Supplier Cost Index

## Methodology Report

August 2022



**Infometrics**

Economics put simply

## Authorship

This report has been prepared by Principal Economist Brad Olsen, with the input of Economist Paul Barkle, Chief Forecaster Gareth Kiernan, and Chief Economist Dr Adolf Stroombergen.

Email:

[Brad.Olsen@infometrics.co.nz](mailto:Brad.Olsen@infometrics.co.nz)

---

All work and services rendered are at the request of, and for the purposes of the client only. Neither Infometrics nor any of its employees accepts any responsibility on any grounds whatsoever, including negligence, to any other person or organisation. While every effort is made by Infometrics to ensure that the information, opinions, and forecasts are accurate and reliable, Infometrics shall not be liable for any adverse consequences of the client's decisions made in reliance of any report provided by Infometrics, nor shall Infometrics be held to have given or implied any warranty as to whether any report provided by Infometrics will assist in the performance of the client's functions.

---

# Table of contents

---

<b>Grocery Supplier Cost Index .....</b>	<b>4</b>
<b>Approach.....</b>	<b>4</b>
Step 1: A timeseries of item-level costs.....	4
Step 2: Merchandise category costs .....	4
Step 3: Cost changes .....	5
Step 4: Weighting the "basket" .....	5
Step 5: Calculating the component changes.....	5
Step 6: Calculating the index.....	5
Department levels .....	6
Products increasing in cost.....	6

# Grocery Supplier Cost Index

---

**This short note explains the methodology used to construct the Infometrics-Foodstuffs NZ Grocery Supplier Cost Index.**

Foodstuffs New Zealand has commissioned Infometrics to produce a monthly index of changes in grocery supplier costs.

The Infometrics-Foodstuffs New Zealand Grocery Supplier Cost Index (GSCI) measures the change in the cost of grocery goods charged by suppliers to the Foodstuffs North and South Island cooperatives.

## Approach

The approach taken to construct the Grocery Supplier Cost Index is to construct a Laspeyres price index.

### Step 1: A timeseries of item-level costs

Infometrics has utilised supplier terms data, from January 2018 to the present, to establish a timeseries of costs for each individual item each month.

Supplier terms detail the cost of purchasing supplies from a supplier over time, with costs established for a set time period. When a cost changes, that cost becomes the operative cost from that month going forward, until such time as the cost is further updated. Using this data produces a comprehensive timeseries of item-level costs.

For example, supplier costs for lemons might be updated in January 2019, April 2019, and June 2019. In this example, the cost of lemons in February and March 2019 is set to the January level, as the cost was not updated in either of those months, so the prevailing cost remains. A new cost is then established in April, which becomes the prevailing cost for the April month. This April cost figure is also used in May, as there was no cost update that month, and then a new cost figure again is recorded for June.

### Step 2: Merchandise category costs

The cost timeseries, at an item level, are then condensed to the merchandise category level. This step allows for comparable matching of cost changes with basket weights. For a variety of reasons, using real world data at an item-level produces poor matches between items provided by suppliers and total sales volumes.

For example, there might be one item sold at a supermarket (say, apples), but multiple supplier items (apples being supplied by many different providers), meaning that there isn't a good match between supplier items and the basket weights.

As a first order approximation when actual weights are unknown, we use a normalised inverse square root method to weight individual item costs within each merchandise category. This method makes the assumption that, within a merchandise category of highly substitutable goods, items of lower price are more likely to be bought than items

of higher price, all else being equal. The method has been tested with alternative values for the elasticity of substitution, Robustness testing is ongoing.

This method produces a cost timeseries at a merchandise category level for each month from January 2018 onwards.

### Step 3: Cost changes

Using the timeseries of costs at a merchandise category level allows us to calculate a monthly change in price by merchandise category, by taking the formula:

$$\frac{(New\ cost - old\ cost)}{old\ cost} \times 100$$

This step produces a timeseries of monthly changes in cost at a merchandise category level. Prices that did not change in a month have a change in cost of zero.

### Step 4: Weighting the “basket”

Infometrics has used actual sales volumes from Foodstuffs at a merchandise category level to create appropriate weightings for the Index, with a reweighting of the basket at regular intervals. This method of weighting and reweighting is usual for a Laspeyres price index and is similar to how the Consumers Price Index and Food Price Index, both published by Statistics New Zealand, are produced.

For the Grocery Supplier Cost Index, the basket is reweighted each year, using calendar year sales data for the prior year. For example, the Index each month in 2021 is weighted on sales volumes for the 2020 calendar year. From January 2022, the Index is weighted on sales volumes for the 2021 calendar year.

The weight for each product is calculated as the sales for that merchandise category as a percentage of total sales. For department-level analysis, the weight is calculated as the sales for that merchandise category as a percentage of total sales in that department.

### Step 5: Calculating the component changes

To appropriately reflect the contribution of cost changes for each merchandise category, to produce the main Index, the price change for each merchandise category (in Step 3) is multiplied by the weight for that merchandise category (in Step 4).

This step is also performed for each department level (which groups products together, into department areas such as produce, butchery, etc).

### Step 6: Calculating the index

The results from Step 5 produce the percentage point contribution to the overall change in average weighted grocery supplier costs. Aggregating these contributions together produces an overall change in the average weighted price.

Starting the index at the value of 1,000 in January 2018, the monthly change in averaged weighted grocery supplier costs is then applied to the last month's index number, to produce a timeseries of indexed grocery supplier costs.

The formula for this procedure is:

$$\text{Previous month's index} \times (1 + \text{calculated percentage change})$$

So, a 2.0% monthly change for February 2018 would produce:

$$\begin{aligned} [\text{Previous month's index} = 1,000] \times (1 + [\text{calculated percentage change} = 2.0\%]) \\ = 1,020 \end{aligned}$$

The same calculations can be run for department-level analysis.

## Department levels

The following department levels are recorded:

Department	Note
Bakery	
Bulk Foods	
Butchery	
Café	Not reported
Chilled Foods	
Florist	Not reported
Frozen Foods	
General Merchandise	
Grocery	
Liquor	
Produce	
Seafood	
Service Delicatessen	
Services	Not reported
Tobacco	

## Products increasing in cost

Infometrics also reports on the number of individual items that increase in cost each month. This is the raw count of products that showed an increase in cost for the month in question.