



# NSW HEALTHY FOOD BASKET

## COST, AVAILABILITY AND QUALITY SURVEY

areas in NSW, current people in lower socio-economic groups and those living in more remote areas have fewer population groups may impact on their preferences for, and consumption of, this important food group. People in low population groups and vegetables of the same quality as is available to residents in metropolitan locations. Food budgeting programs as buying fruit and vegetables in season and using tinned and frozen alternatives, may be a useful strategy to reduce The Cancer Council NSW recommends that government price surveillance mechanisms be introduced, to ensure all families of a healthy food basket exists both within and between geographic and demographic areas in NSW. Current people



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The purpose of this study was to determine the cost of a standard basket of healthy food across NSW, with a specific focus on the cost, availability and quality of fruit and vegetables. The three key indicators of cost, availability, and quality were examined by the SES and remoteness of localities.

### KEY FINDINGS AND RECOMMENDATIONS

- » **Extensive variability in the cost of a healthy food basket exists both within and between geographic and demographic areas in NSW.**  
.....
- » **Currently people in lower socio economic groups and those living in more remote areas have fewer fruit and vegetable varieties available. The reduced availability of fruit and vegetables for these population groups may impact on their preferences for, and consumption of, this important food group.**  
.....
- » **People in lower socio economic groups and those living in remote areas deserve equal access to a variety of fruit and vegetables of the same quality as is available to residents in metropolitan locations.**  
.....
- » **Food budgeting programs, which educate consumers on how to purchase appropriate and nutritious foods cheaply, such as buying fruit and vegetables in season and using tinned and frozen alternatives, may be a useful strategy to reduce the price burden of purchasing a healthy food basket.**  
.....
- » **To prevent the impact of price variability The Cancer Council NSW recommends that government price surveillance mechanisms be introduced, to ensure all families can afford to purchase and consume a healthy food basket.**  
.....

# COST, AVAILABILITY AND QUALITY SURVEY

## INTRODUCTION

Economic factors and access issues can affect people's consumption of healthy foods. Higher costs, lower availability and poorer quality of healthy food choices can have a negative impact on the nutritional quality of people's diets, their nutritional status and ultimately their health outcomes.<sup>1-3</sup>

Healthy Food Basket Surveys conducted in other states of Australia, including Queensland,<sup>4,5</sup> the Northern Territory,<sup>6</sup> Victoria,<sup>7</sup> and South Australia,<sup>8</sup> have demonstrated that the cost of healthy food in remote areas is significantly higher than in metropolitan areas. As well, the quality and variety of fruit and vegetables declines with increasing distance from city centres.

To date, there have been no comprehensive surveys undertaken relating to the costs and availability of healthy foods across New South Wales (NSW), although some smaller surveys have been conducted in Sydney and Wollongong.<sup>9,10</sup>

Studies on the differences in food costs based on the socio economic status (SES) of areas are more limited, although poorer consumption of fruit and vegetables and a higher prevalence of overweight and obesity among lower SES groups, are well documented.<sup>11</sup>

## METHODS

### Sample selection

Volunteers and staff from each of the 10 Cancer Council NSW regional offices located throughout NSW (Central Sydney, Western Sydney, Central Coast, Hunter, Mid North Coast, Far North Coast, North Western NSW, Western NSW, South Western NSW and Southern NSW) were recruited to implement the survey.

A total of 157 stores were surveyed. Seven of these stores were excluded from analyses as they were either: Aldi stores (n = 3), as these stores are known to be considerably cheaper and would not represent usual cost, online supermarkets (n = 2), due to a small number of representative stores for this type of supermarket, or if they had missing data for more than 10 food items (n = 2). The final sample was 150 stores.

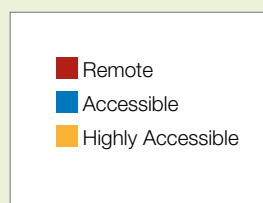
Selected stores were categorised by remoteness and SES. Based on postcode, the Accessibility/Remoteness Index of Australia (ARIA+) score was used as an estimate of remoteness and access to services.<sup>12</sup> ARIA+ scores were divided into tertiles: 'highly accessible', 'accessible' and 'remote'. Table 1 shows the breakdown of the number of stores in each category.

Similarly the Australian Bureau of Statistics Socio Economic Indicators for Areas (SEIFA) score, as determined by the Index of Relative Socio Economic Advantage/Disadvantage (IRSAD),<sup>13</sup> was used as an estimate of the SES of localities. SEIFA scores were divided into quintiles (1-5), with quintile 1 representing the area with the lowest SES.

Data were collected over a two week period in December 2006.

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## STORE LOCATIONS MAP FOR NSW



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## Survey Tool

The healthy food basket represents commonly available and popular food choices selected to provide 95% of the estimated energy requirements of a reference family of six people over a two-week period. This reference family is based on two adults (male and female, >19 years), three children (2 boys, 4 and 14 years; 1 girl, 8 years) and an elderly woman (>61 years). The survey instrument was modelled on that used in the Queensland Healthy Food Basket.<sup>4,5</sup>

The range of foods listed in the survey included breads and cereals; fruit, vegetables and legumes; meat and meat alternatives; dairy foods, and some energy dense 'extra' foods (Table 2).

## Cost

Surveyors were instructed to price the cheapest non-generic brand, and record the brand name. Where the specified size was not available, the next smallest package size was priced and the weight was recorded. The recorded price was adjusted for portion size. The availability of each product was also recorded.

For fresh fruit and vegetables, the price per kilogram was recorded. However if the product was priced per unit (eg lettuce), the item was weighed and the price and weight were recorded.

## Availability

The availability of 30 different fresh fruits and vegetables was recorded. The included survey items were based on those used in the Queensland Healthy Food Basket,<sup>4,5</sup> and were selected according to the most commonly consumed fruit and vegetables. Surveyors recorded if the listed fruit and vegetables were available and the number of different available varieties of that particular fruit or vegetable.

## Quality

Quality was assessed for 10 varieties of fresh fruit and vegetables using a five-point visual assessment method. Surveyors were instructed to subjectively rate the quality of these fruits and vegetables based on whether all, most, half, some, or few of that item on display were good against the combined criteria of whether the produce was not aged, bruised or mouldy. For each store, a maximum score of 50 (all good for all varieties) and a minimum of zero (few good for all varieties) were attainable.

Permission was not sought from the store owners to conduct the survey; the information collected was publicly available, and prior knowledge of the survey may have biased the results, as available produce at the time of the survey may not have reflected usual produce.

## Data Analysis

Data were analysed using SPSS for Windows version 15.0. Linear regression, where SEIFA quintiles and ARIA+ tertiles were entered as categorical dummy variables, was used to determine the association of SES and remoteness with grocery cost and fruit and vegetable availability. The highest SES and highly accessible areas were used as the referent groups in all models. For missing items, the sample mean price for the item was used.

Quality of fruit and vegetables was assessed using the Kruskal-Wallis test (non-parametric ANOVA). Results were considered statistically significant at the  $\alpha=0.05$  level.

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## RESULTS

### Overall Cost of the Healthy Food Basket

The overall cost of the healthy food basket ranged from \$337.29 (Blaxland, Western Sydney) to \$519.71 (Murrurundi, Hunter region), a difference of \$182.42 between the cheapest and the most expensive basket.

The mean price of the food basket was \$435.59 (95% CI: \$430.85 - \$440.34) (Figure 1). Over a 12-month period, it would cost a family of six \$11,325.34 for a standard basket of food to meet their nutritional requirements, however this could range from between \$11,202.10 and \$11,448.84.

The cost of the total food basket increased by remoteness (non-significant) (Figure 1). The mean cost of the food basket was \$184.86 more expensive per year in the remote locations, compared with the highly accessible locations.

There was no apparent trend between the cost of the total food basket and the SES of the location (Figure 1).

### Cost of Food Groups Within the Food Basket

Fruit and vegetables contributed the largest component of the total food basket cost (44%), followed by breads and cereals (24%), meat and meat alternatives (18%), dairy foods (10%) and extras (4%). This ranking is consistent with the recommended dietary proportions for each food group in the Australian Guide to Healthy Eating.<sup>14</sup> Of the 44 items in the healthy food basket, 15 items were fruits and vegetables (34%), including fresh, frozen and canned varieties.

### Cost of Fruit and Vegetable Component

The mean cost of the fruit and vegetable component of the food basket was \$194.66 (191.40 – 197.92) (Figure 2).

The cost of the fruit and vegetables increased by remoteness, with those in remote areas paying \$256.36 more per year than those in the highly accessible areas. While the overall association between the remoteness of the area and the cost of fruit and vegetables was not statistically significant, fruit and vegetables were significantly more expensive in remote areas compared with highly accessible areas ( $t_{146} = 1.96$ ,  $P=0.05$ ) (Figure 2).

There was no apparent trend for the cost of fruit and vegetables according to the SES of the location (Figure 2).



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### Cost of Other Food Basket Components

The cost of breads and cereals, dairy foods and extra foods decreased with remoteness (non-significant) (Table 3). The mean cost of breads and cereals was \$103.16, with those in remote areas paying \$50.18 less per year than those in highly accessible areas. The mean cost of dairy products was \$41.98, with those living in remote locations paying \$23.40 less per year than those living in highly accessible areas. Lastly, the mean cost of extra foods was \$15.96; with those people living in remote areas paying \$33.28 less per year than people living in highly accessible areas.

There was no apparent trend between the cost of meat and meat alternatives and remoteness.

Also, there was no apparent trend between the cost of any component food group within the healthy food basket and SES.

### Variety of Fruit and Vegetables

The mean number of fresh fruit and vegetable varieties in NSW stores was 67 (63.8 – 69.7). This ranged from 23 (Wauchope, Mid North Coast) to 119 varieties (Armidale, North West).

There was a trend for a decreasing number of fruit and vegetable varieties available with increasing remoteness. Highly accessible areas had nine more fruit and vegetable varieties to select from (73, 69.45 – 77.5) compared with the accessible areas (64, 60.4 – 68.1), and 13 more than remote areas (60, 49.3 – 70.17) (Figure 3).

Similarly, there was a lower number of fruit and vegetable varieties available in the lower SES areas compared to the higher SES areas. Quintile 2 had five fewer varieties of fruit and vegetables to choose from (62, 57.0 – 67.2) compared with the

state mean. In contrast quintile 5, the highest SES areas, had 10 more varieties of fruit and vegetables to select from (77, 72.0 – 82.2) compared with the NSW mean (Figure 3).

The association between both SES and remoteness of localities, and fruit and vegetable variety was significant ( $F_{(6, 143)} = 2.75, P = 0.015$ ). Together, both SES and remoteness are attributable for 10% of the variation in fruit and vegetable variety across the entire sample.

### Quality of Fruit and Vegetables

The mean quality score for fruit and vegetables in NSW was 42 (40.24 – 43.10), out of a possible score of 50 points. The lowest score was identified in Guyra, North West, with a score of 10 points. The highest score was 50 points, which was identified in 19 stores across all areas.

Highly accessible areas scored an average of 4 points more for quality than the remote locations (43, 41.7 – 44.8; vs. 39, 33.6 – 45.3) (non-significant). Also, there was no significant association between the quality score for fruit and vegetables and SES (Figure 4). Quality was not associated with the cost of fruit and vegetables.

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## DISCUSSION

This study provides the largest analysis of cost, availability and quality of healthy foods in Australia, with a store sample of 150 food outlets. The unique position of The Cancer Council NSW, in that it has satellite centres dispersed around NSW, allowed for the collection of data from both a large number of stores, and from diverse areas across NSW.

### Cost of the Healthy Food Basket

According to the Australian Bureau of Statistics *Household Income and Income Distribution* (2007) report, the average family income for two adults aged 44 years with dependent children is \$646 per week.<sup>15</sup> According to the current healthy food basket survey, this family would need to spend 22% of their income on groceries to meet their energy and nutrient requirements. However, for people with below average incomes, a considerably higher proportion of their income would be spent on groceries. Households in the lowest quintile of income, earning an average of \$390 per week,<sup>15</sup> would spend 56% of their income to purchase a healthy food basket.

One of the most striking findings from the current survey was the variability in the price of a healthy food basket across NSW. Across all stores surveyed there was a difference of \$182.42 between the cheapest basket (\$337.29 in Western Sydney) and the most expensive basket (\$519.71 in the Hunter region). Variability in the cost of the healthy food basket *within* regions was also considerable. The variability in the cost of the healthy food basket was not associated with the different supermarket chains. The high variability of grocery prices lends itself to recommendations for price monitoring across NSW. Proposals to strengthen the Australian Competition and Consumer Commission's role in monitoring the price of supermarket prices<sup>16</sup> would help to ensure that all families pay a similar price for grocery items, regardless of where they live.

There was a positive linear trend for the increasing cost of the total food basket with remoteness (as areas became more remote, the cost of the healthy food basket increased). While the overall association between remoteness and cost of fruit and vegetables was not statistically significant, there was a significant difference in the cost of fruit and vegetables between highly accessible and remote areas. Those living in remote locations pay \$256.36 more per year for fruit and vegetables than those in the highly accessible areas. This trend has been identified in previous research.<sup>4,5</sup> In the Healthy Food Basket surveys conducted in Queensland, the over-sampling of very remote areas revealed a significant difference in cost by remoteness. NSW has relatively few very remote areas.

In the 2006 Queensland Healthy Food Basket Survey,<sup>5</sup> the cost of the overall basket was \$457.46; 5% more expensive than NSW, and the fruit and vegetable component was \$204.99; again, 5% more expensive than in NSW. In very remote Queensland areas, the cost of the total food basket increased to \$554.18, and fruit and vegetables increased to \$242.22.

The increased cost involved in transporting groceries to more remote areas, and subsequent increased fuel usage are likely to add to the cost of the grocery items; which is ultimately paid for by consumers in these remote areas.

There were no clear trends between the cost of the healthy food basket and the SES of localities. Similar findings between cost and SES have been identified in previous research from Adelaide, which indicated no clear trend between healthy food basket cost and SES of areas.<sup>17</sup>

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### Variety of Fruit and Vegetables Available

Overall, during the survey period there was a wide variety of fruits and vegetables available for purchase. A total of 30 different fruit and vegetable types were included in the survey tool, and of these an average of 68 different varieties were recorded across NSW, for example in some stores there were up to eight different varieties of apples available.

Both SES and remoteness were associated with fruit and vegetable variety, with lower SES and increasing remoteness being significantly associated with fewer available varieties. This trend for decreasing availability of fruit and vegetables varieties with remoteness has also been previously demonstrated in Queensland.<sup>4,5</sup> These Queensland surveys were conducted between April and May, indicating that the disparity between remote and accessible areas is not simply a seasonal issue.

A recent systematic review of research relating to fruit and vegetable variety and consumption of this food group found that availability was positively associated with consumption.<sup>1</sup>

### Quality

Quality of food, in particular perishable items such as fresh fruit and vegetables, is a key factor in achieving food security; which refers to the ability of families to obtain nutritious food on a regular and reliable basis.<sup>18</sup> The quality of fruit and vegetables determines its nutrient content, and will also affect its acceptability for purchase.

In the current survey, the overall quality of fruit and vegetables in NSW was reasonably good. The mean quality score for fruits and vegetables in NSW was 42, out of a possible score of 50 points. No one particular fruit and vegetable item was consistently of poorer quality, with the mean quality score for all survey items being 4 out of a possible 5 points. The areas with the poorest overall quality of fruit and vegetables were Guyra and Glen Innes in the North Western region; Mudgee in the Western region; Salamander Bay in the Hunter; and Warilla Grove in the Southern region. Each of these localities received a score of less than 15 points out of a possible 50.

While there was some difference in the quality of fruit and vegetables according to the SES of locations this association was not statistically significant; the low SES and mid SES locations had the poorest quality of fruit and vegetable available, each with a score of 40, and the high SES locations had the best quality fruit and vegetables available with a score of 43. Similarly there was no significant association between the quality of fruit and vegetables according to remoteness.

# NSW HEALTHY FOOD BASKET

## CONCLUSION

This survey has identified potential barriers to the access to, and purchase of, a healthy food basket. Previous research on the cost of a healthy food basket in the Northern Territory<sup>6</sup> and Queensland<sup>4,5</sup> has shown a trend for increasing cost with remoteness. Findings from NSW indicate that whilst the cost of the total basket and fruit and vegetables appear to follow this trend, there was a large variability within different remoteness groupings.

The classification of areas according to SES, using postcodes as a proxy for location, may have obscured any trend in the cost of the healthy food basket according to SES. Postcodes, particularly in regional and remote areas often span large geographical areas.

Other barriers to the attainability of a healthy food basket, including the variety of fruit and vegetables available and the quality of these fruit and vegetables, appear to be more disparate between different demographic areas. However, while lower SES and remote areas offered fewer varieties of fruits and vegetables of poorer qualities than higher SES and more accessible areas, it cannot be said that these areas had few varieties or poor quality. In general the number of varieties and the quality of fruit and vegetables in these areas was reasonable, although there are no benchmark standards for variety and quality available for comparison.



## RESULTS TABLES AND FIGURES

**TABLE 1: CLASSIFICATION OF FOOD STORES IN THE SAMPLE.**

| Classification                               | Number of Stores |
|--|------------------|
| <b>SEIFA score for socio economic status</b> |                  |
| 1 (very low)                                 | 27               |
| 2  | 32               |
| 3  | 35               |
| 4  | 31               |
| 5 (very high)                                | 25               |
| <b>ARIA+ score for remoteness</b>            |                  |
| Highly accessible                            | 52               |
| Accessible                                   | 75               |
| Remote                                       | 23               |



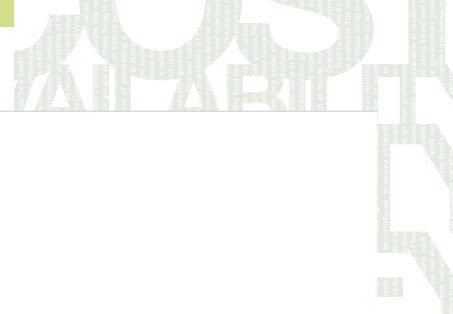
## RESULTS TABLES AND FIGURES

**TABLE 2: THE COMPOSITION OF THE HEALTHY FOOD BASKET, BASED ON NUTRIENT REQUIREMENT OF THE REFERENCE FAMILY.**

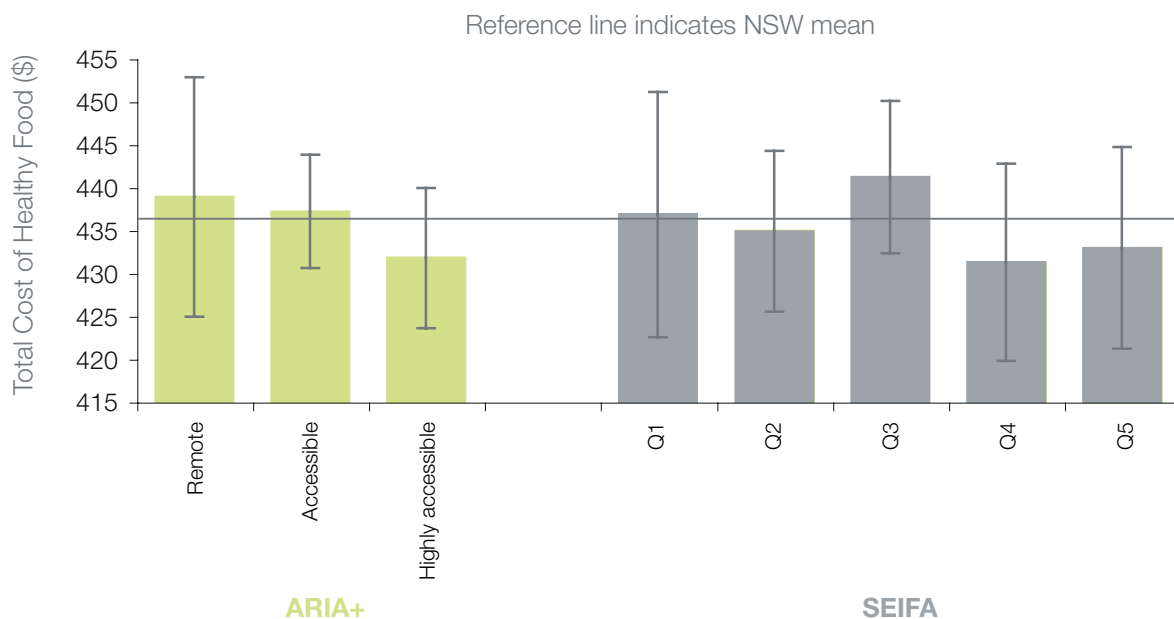
| Product                                    | Reference Family Requirement |
|--|------------------------------|
| Tomatoes*                                  | 5kg                          |
| Potatoes*                                  | 10kg                         |
| Pumpkin*                                   | 1.5kg                        |
| Cabbage*                                   | 1.5kg                        |
| Lettuce*                                   | 1.5 whole                    |
| Carrots*                                   | 2kg                          |
| Onions*                                    | 2kg                          |
| Apples*                                    | 6kg                          |
| Oranges*                                   | 11kg                         |
| Bananas*                                   | 5kg                          |
| Fresh milk                                 | 8L                           |
| Fresh reduced fat milk                     | 1L                           |
| Powdered milk, whole                       | 1kg                          |
| Powdered milk, skim                        | 1kg                          |
| UHT, whole milk                            | 4L                           |
| Cheese, yellow, hard                       | 500g                         |
| Tinned corned beef                         | 340g                         |
| Tinned meat and onion                      | 820g                         |
| Beef mince                                 | 1kg                          |
| Rump steak                                 | 1kg                          |
| Tinned baked beans                         | 1.7kg                        |
| Frozen chicken                             | 2kg                          |
| Tinned smoked oysters                      | 170g                         |
| Dozen large eggs                           | 1.32g                        |
| Sausages (plain beef)                      | 1kg                          |
| Sliced ham                                 | 1kg                          |
| Canola, sunflower or olive-based margarine | 1.5kg                        |
| White sugar                                | 3kg                          |
| Canola Oil                                 | 0.75L                        |

| Product                 | Reference Family Requirement |
|-------------------------|------------------------------|
| Loaf of white bread     | 6.8kg                        |
| Loaf of wholemeal bread | 6.8kg                        |
| White flour, plain      | 2.5kg                        |
| Wholemeal flour, plain  | 2.5kg                        |
| Wheat biscuit cereal    | 1.5kg                        |
| Rolled oats             | 750g                         |
| White rice              | 5kg                          |
| Tinned spaghetti        | 1.275kg                      |
| Instant noodles         | 1.02kg                       |
| Arnott's Sao biscuits   | 1kg                          |
| Frozen peas             | 2.5kg                        |
| Tinned peas             | 880g                         |
| Tinned beetroot         | 450g                         |
| Tinned fruit            | 3.52g                        |
| Orange juice (100%)     | 4L                           |

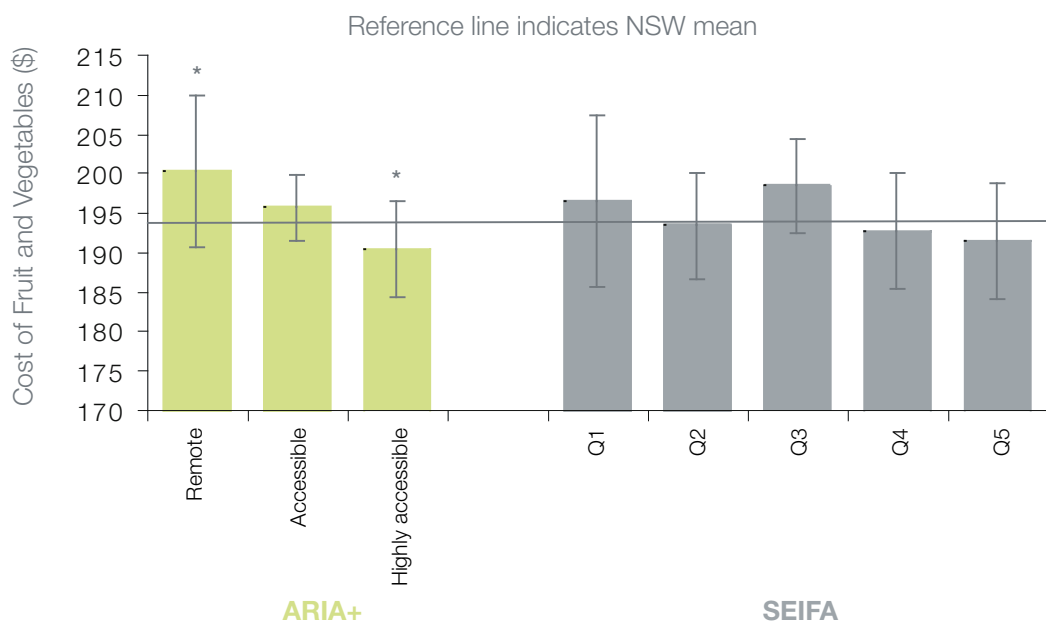
\*Indicates fruit and vegetable items assessed for quality.



**FIGURE 1: THE MEAN COST AND 95% CONFIDENCE INTERVAL OF THE TOTAL HEALTHY FOOD BASKET, ACCORDING TO REMOTENESS AND SES.**



**FIGURE 2: THE MEAN COST AND 95% CONFIDENCE INTERVAL OF THE FRUIT AND VEGETABLE COMPONENT, ACCORDING TO REMOTENESS AND SES.**



\*P = 0.05

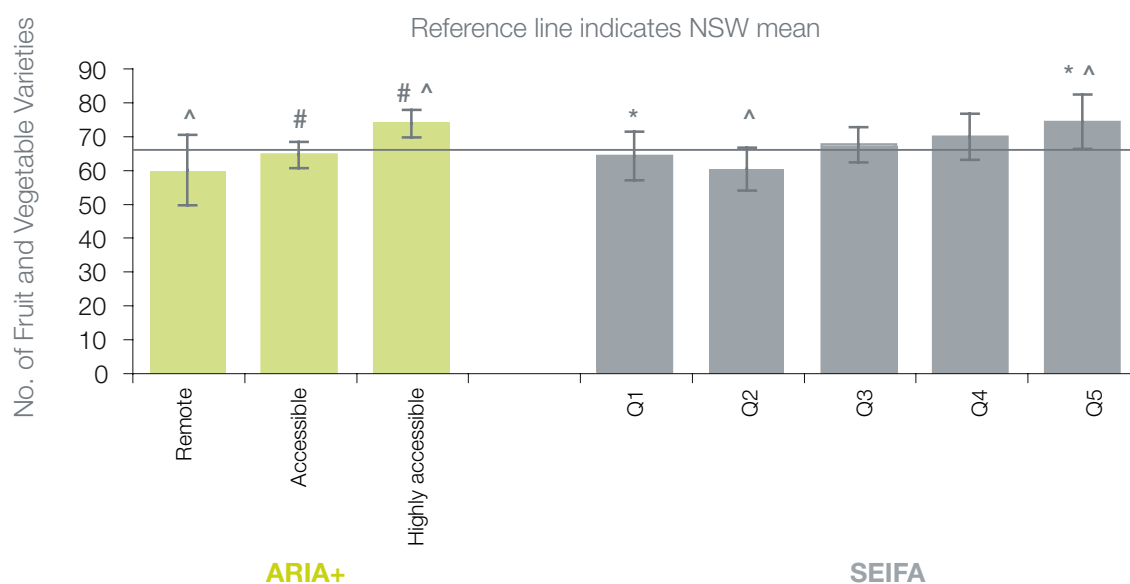
## RESULTS TABLES AND FIGURES

**TABLE 3: COMPARISON OF THE COST OF THE HEALTHY FOOD BASKET COMPONENT FOOD GROUPS, ACCORDING TO REMOTENESS AND SES.**

| Food Group            | Mean cost (95% CI)         | Association of mean cost with ARIA+ | Association of mean cost with SEIFA |
|-----------------------|----------------------------|-------------------------------------|-------------------------------------|
| Fruit and vegetables  | \$194.66 (191.40 – 197.92) | ↑ with remoteness*                  | No apparent trend                   |
| Breads and cereals    | \$103.16 (101.16 – 105.17) | ↓ with remoteness (ns)              | No apparent trend                   |
| Meat and alternatives | \$79.82 (78.52 – 81.12)    | No apparent trend                   | No apparent trend                   |
| Dairy                 | \$41.98 (41.42 – 42.55)    | ↓ with remoteness (ns)              | No apparent trend                   |
| Extras                | \$15.96 (15.54 – 16.38)    | ↓ with remoteness (ns)              | No apparent trend                   |

\* Significant difference between highly accessible and remote areas (P = 0.05).

**FIGURE 3: THE MEAN NUMBER OF VARIETIES AND 95% CONFIDENCE INTERVAL FOR AVAILABLE FRUIT AND VEGETABLES, ACCORDING TO REMOTENESS AND SES.**

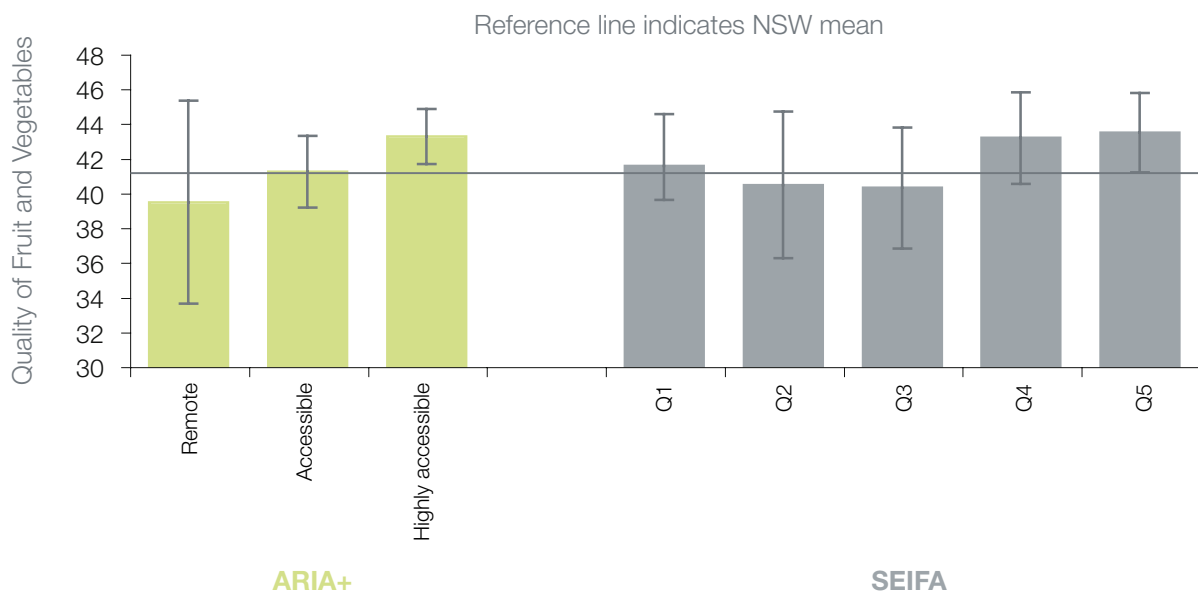


\* P = 0.05

^, # P = 0.01



**FIGURE 4: THE MEAN QUALITY SCORE AND 95% CONFIDENCE INTERVAL OF FRUIT AND VEGETABLE VARIETIES, ACCORDING TO REMOTENESS AND SES.**



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... tibles of the same quality as is available to residents in  
... fruit and vegetables in season and using tinned and frozen  
... Cancer Council NSW recommends that government price  
... cost of a healthy food basket exists both within and between  
... and vegetable varieties available. The reduced availability of fruit  
... of socio economic groups and those living in remote areas deserve  
... ms, which educate consumers on how to purchase appropriate and  
... duce the price burden of purchasing a healthy food basket. To prevent  
... sure all families can afford to purchase and consume a healthy food  
... ntly people in lower socio economic groups and those living in more  
... ay impact on their preferences for, and consumption of, this important  
... of the same quality as is available to residents in metropolitan locations.  
... egetables in season and using tinned and frozen alternatives, may be a  
... NSW recommends that government price surveillance mechanisms be  
... basket exists, both within and between geographic and demographic  
... ties available. The reduced availability of fruit and vegetables for these  
... oops and those living in remote areas deserve equal access to a variety of  
... nsurers on how to purchase appropriate and nutritious foods cheaply, such  
... of purchasing a healthy food basket. To prevent the impact of price variability  
... o purchase and consume a healthy food basket. Extensive variability in the cost  
... economic groups and those living in more remote areas have fewer fruit and  
... nces for, and consumption of, this important food group. People in lower socio  
... vailable to residents in metropolitan locations. Food budgeting programs, which  
... using tinned and frozen alternatives, may be a useful strategy to reduce the price  
... ernment price surveillance mechanisms be introduced, to ensure all families can  
... between geographic and demographic areas in NSW. Currently people in lower  
... ability of fruit and vegetables for these population groups may impact on their  
... as deserve equal access to a variety of fruit and vegetables of the same quality  
... ate and nutritious foods cheaply, such as buying fruit and vegetables in season  
... vent the impact of price variability. The Cancer Council NSW recommends that  
... et. Extensive variability in the cost of a healthy food basket exists both within  
... ote areas have fewer fruit and vegetable varieties available. The reduced  
... group. People in lower socio economic groups and those living in remote  
... d budgeting programs, which educate consumers on how to purchase  
... ul strategy to reduce the price burden of purchasing a healthy food  
... duced, to ensure all families can afford to purchase and consume a  
... SW. Currently people in lower socio economic groups and those  
... oops may impact on their preferences for, and consumption of,  
... of the same quality as is available to residents in metropoli-  
... and vegetables in season and using tinned and frozen  
... Council NSW recommends that government price  
... healthy food basket exists both within and between  
... ties available. The reduced availability of fruit  
... and those living in remote areas deserve  
... ow to purchase appropriate and  
... healthy food basket.