Minerals in Australian fruits and vegetables

- a comparison of levels between the 1980s and 2000

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Abstract

Potassium, sodium, calcium, magnesium, iron and zinc levels in 44 types of Australian fruits and vegetables were measured in samples purchased in Melbourne, Australia in 2000 or 2001 and compared with the results of analyses conducted between 1981 and 1985 for the same items of produce purchased in Sydney, Australia. A comparison of values at the two time periods does not indicate that there have been significant or consistent changes in the content of these minerals over this time. Overall mean potassium content of these items in 2000/01 and 1981-85 respectively was 230 and 220 mg/100 g, sodium was 9 and 8 mg/100g, magnesium 15 and 11 mg/100 g, calcium 18 and 16 mg/100 g, iron 0.3 and 0.5 mg/100 g and zinc 0.2 and 0.3 mg/100 g. Comparisons of mineral levels measured at these two times must be made with caution as samples were collected in different locations, sometimes at different times of the year, possibly at different stages of ripeness and in many cases were different varieties. In addition, the older analyses were conducted using a less sensitive analytical technique than the method used in 2000-01. Any minor changes from year to year in mineral levels in these foods would be very unlikely to be of dietary significance.

Introduction

Australian media reports in 2001 (e.g. Patty 2001, Moynihan 2001) raised questions about whether or not nutrient levels in Australian horticultural produce are declining due to changing soil conditions and horticultural practices. These reports were triggered by a British article (Mayer 1997) that compared the mineral content of 20 types of produce reported in the 1980s UK food composition tables, with the same types of produce reported in the 1960s UK tables. The paper claimed a significant reduction in the levels of calcium, magnesium, copper and sodium in vegetables and of magnesium, iron, copper and potassium in fruits. Moisture content in fruits increased over this time. There was no analysis in this paper of whether the varieties (for example of 'eating apples') analysed had changed over the time period of interest. Mayer suggested that a nutritional problem (the nature of which was unspecified) associated with the quality of food has developed over this time. One of the key issues raised in the Australian media reports of Mayer's paper was the age of the published Australian nutrient data for fruits and vegetables; these data were generated in the early 1980s.

Food Standards Australia New Zealand (FSANZ) maintains a database of nutrients in Australian foods and uses this database to prepare food composition publications such as *AUSNUT* (Australia New Zealand Food Authority 1999). In order to assess the need to up-date nutrient data for fruits and vegetables, a small analytical program was instituted in 2002 to measure the levels of six minerals in 44 types of now common fruits and vegetables. These mineral levels were then compared to those measured between 1981 and 1985 in analytical programs conducted by researchers at the University of New South Wales (UNSW).

Materials and methods

Data for the mineral content of horticultural produce purchased in the 1980s were obtained from a number of publications in the series *Composition of Australian Foods*, published in *Food Australia* (formerly known as *Food Technology in Australia*) by a UNSW research team headed by Dr Heather Greenfield and Dr Ron Wills. The results reported in these publications were for the edible portion of produce purchased in Sydney in the years 1981-1985, when seasonally available, from multiple retail outlets across the socio-economic spectrum. Samples from these outlets were combined to form a single composite analytical sample for each type of produce. Some of these 1980s samples were constructed to reflect individual varieties (e.g. Granny Smith apples) and some to reflect whatever was available for retail sale under a common name (such as 'cauliflower').

The mineral content of horticultural produce available in the 2000s was determined by analysis commissioned by FSANZ. Fresh fruits and vegetables[1] purchased in 2000/01 as part of a separate analytical program were analysed in 2002 by AGAL (Australian Government Analytical Laboratories, Clarke Street, South Melbourne) after having been kept in frozen storage. Only the edible portion of the food was analysed (i.e. inedible peel, stem, skin, core and seeds were removed). Samples were sourced directly from two major Victorian distributors according to set growing regions (primarily Victoria, South Australia, Queensland and NSW, with some from Tasmania and Western Australia and kiwifruit from New Zealand). The majority of samples were purchased in August 2000 with some fruits (Valencia oranges, green grapes, Bartlett pears, peach, nectarine, plums, strawberry, watermelon, rockmelon, mango, pineapple) collected in February-March 2001 when they were in season or available. Samples analysed were composite samples prepared from between 6 and 11 separate purchases sourced from different growing regions. As for the 1980s samples, for major produce items such as apples, oranges and potatoes, the composite samples represented a single popular variety (such as Granny Smith apples and Desiree potatoes). For other items, composite samples were constructed to reflect whatever was available for sale under a common name such as 'cauliflower'.

The content of potassium, sodium, calcium, magnesium, iron and zinc was determined in the 1980s using atomic absorption spectroscopy (AAS) following furnace destruction of organic matter. Limit of reporting for these analyses was not stated in the published reports but is assumed to be 1 mg/kg (0.1 mg/100 g) for iron and zinc and 10 mg/kg (1 mg/100 g) for potassium, sodium, calcium and magnesium, based on minimum values reported in these publications. Values reported in the published literature were rounded to no more than three significant figures following conventions for food composition publications (Greenfield and Southgate 1992).

In 2002, the content of potassium, sodium, calcium, magnesium, iron and zinc in the edible portion of the produce items was determined by inductively coupled plasma optical emission spectroscopy (ICPOES) for sodium, potassium, calcium and magnesium or inductively coupled plasma mass spectrometry (ICPMS) for iron and zinc, following microwave digestion with nitric acid. Limits of reporting for these analyses were 1 mg/kg (0.1 mg/100 g)

[1] apple: red delicious, granny smith and golden delicious; banana; orange: navel and valencia; grape: red globe and green seedless; pear: packham and bartlett; kiwifruit; mandarin: murcott, ellendale and imperial; tomato; avocado; lettuce; cucumber; carrot; potato: coliban and desiree; broccoli; onion: white and brown; cabbage; pumpkin: jarrahdale and butternut; cauliflower; zucchini; capsicum: green and red; mushroom; celery; bean; pea; sweet corn; peach; nectarine; plum: red and yellow; strawberry; watermelon; rockmelon; mango; pineapple.

for sodium and potassium, 0.2 mg/kg (0.02 mg/100 g) for iron, calcium and magnesium and 0.01 mg/kg (0.001 mg/100 g) for zinc. Prior to commencing the 2002 analytical program, advice was received from AGAL that the mineral content of the 2000-01 samples should not have been affected by the storage time or the storage containers, other than by any change in moisture content.

Both the 1980s and 2002 studies used a comparable method of moisture analysis, oven-drying at 102°C. Moisture content of the 2000-01 samples was determined at the time of purchase and again at the time of analysis in 2002 to determine whether or not there had been any change in sample moisture content as a result of storage. Results at these two times were compared using a Student's t-test. For each analytical sample, mineral values measured in 2002 were adjusted to reflect the moisture content of that sample at the time of purchase in 2000-01 to take into account any influence on mineral content of moisture change during frozen storage.

The results for mineral levels do not lend themselves to quantitative statistical analysis as in both 1981-85 and 2000-01 only a single composite sample of each type of produce was analysed. Therefore there is no information available on the variation in mineral content between individual purchases combined to form the composite analytical sample. In addition, the 2000-01 samples were not directly comparable to 1980s samples as they were likely to have been produced in different growing areas, sometimes at different times of the year, were often of different variety, were analysed using different methods and in some cases included slightly different edible components. Instead a qualitative comparison was made of results found in 2000-01 and 1981-85 and differences in mineral levels were related to published information on variation in mineral content between and within varieties, where this is known.

Results

Table 1 compares levels of potassium, sodium, calcium, magnesium, iron and zinc found in the edible portion of raw fruits and vegetables purchased in 2000-01 to those purchased in 1981-85. Where information was available on variety of produce, this has been included. The edible portion included in the analytical sample is identified and in some cases (e.g. tomato, strawberry) was slightly different between the two analytical programs.

The mean contents of the six minerals analysed were, overall, very similar in the 1980s to levels found in the 2000-01 samples. While overall mean mineral levels were higher in 2000-01 than in 1981-85 for magnesium (15 vs 11 mg/100 g), sodium (9 vs 8 mg/100 g), potassium (230 vs 220 mg/100 g) and calcium (18 vs 16 mg/100 g), levels were lower for iron (0.5 vs 0.3 mg/100 g) and zinc (0.3 vs 0.2 mg/100 g).

Mean moisture content of all samples purchased in 2000-01 was similar to the levels measured in the 1980s (86.6 g/100 g and 86.7 g/100 g respectively). This indicates that any changes in overall mineral content are not attributable to changes in overall moisture content of samples at purchase. There was no significant difference between the overall moisture content measured at purchase in 2000 (86.6 g/100 g) and in 2002 after frozen storage (87.8 g/100 g) ($P<0.05$).

The food with the most notable change in mineral content was sweet corn, where levels of iron, potassium and calcium measured in samples from 2000-01 were less than half those

measured in the 1980s. In contrast, magnesium levels in corn more than doubled over this time. Moisture content of corn was higher in the 2000 sample (79.0 g/100 g) than in the 1983-84 sample (70.6 g/100 g), which would account for a portion of the change in mineral levels. Other notable differences in mineral content between 1981-85 and 2000-01 were for magnesium in mango (250 vs 160 mg/100 g respectively), iron in red-skinned potato (0.5 vs 0.2 mg/100 g) and in strawberry (0.6 vs 0.3 mg/100 g), and potassium and calcium in butternut pumpkin (potassium: 470 vs 280 mg/100 g, calcium: 23 vs 13 mg/100 g). For mango and red-skinned potato, the variety analysed had changed over these two decades. The edible portion of strawberry analysed in the two programs was slightly different, as the 2000-01 samples did not include the strawberry tops. For butternut pumpkin, the difference in potassium and calcium contents between the two studies is consistent with the magnitude of variation reported between varieties of pumpkin studied in 1983-84.

Discussion

Nutrient levels in foods are variable. In the case of fruits and vegetables, mineral levels can be affected by factors such as the variety of the produce item, time of harvest, ripeness, climate, soil conditions including fertiliser application, and storage and marketing conditions. As biological materials, fruits and vegetables are also subject to random variation in mineral content (Greenfield and Southgate 1992, Torelm amd Danielsson 1998).

There has been little published research in Australia on the variation in mineral levels within available produce at retail level other than by Wills and coworkers in the 1980s. Wills and others (1984b) studied variation in mineral content over a 12-month period in the edible portion of Australian Flora-dade tomatoes. Sodium, magnesium and zinc levels were relatively constant, potassium values ranged from 190-220 mg/100 g, calcium levels from 6-11 mg/100 g and iron levels from 0.3-0.4 mg/100 g. Similar patterns were observed between tomato varieties, particularly in iron levels which ranged from 0.3-0.6 mg/100 g. Wills and others (1983) reported the mineral content of seven varieties of peaches to vary as follows: potassium 170-220 mg/100 g, calcium 4-9 mg/100 g and iron 0.1-0.4 mg/100g; sodium, magnesium and zinc levels were relatively constant between varieties. Similar patterns were reported for six varieties of plums, with potassium levels ranging from 140-190 mg/100 g and iron from 0.1-0.4 mg/100g.

Much larger variation in the mineral content of fruits and vegetables is reported in the German food composition tables (Scherz & Senser 1994) than was found by Wills and others. For example for potatoes (variety unspecified), variation between individual samples was as follows: sodium 1-5 mg/100 g; potassium 340-600 mg/100 g; magnesium 17-32 mg/100 g; calcium 6-14 mg/100 g; iron 0.3-1.5 mg/100 g; zinc 0.3-0.5 mg/100 g. For apple, sodium varied from 2-4 mg/100 g, potassium 100-175 mg/100 g, magnesium 3-9 mg/100 g, calcium 4-11 mg/100 g, iron 0.3-0.9 mg/100 g and zinc 0.04-0.2 mg/100 g. US food composition tables (USDA 2004) provide information on the standard error in nutrient levels for some foods. For fruits and vegetables, the relative standard error was typically in the range of 1 to 10% of the mean, and sometimes higher than this. Torelm & Danielsson (1998) reported up to a tenfold variation in levels of some minerals (e.g. potassium in carrots) between purchases made at different times and places in Sweden. In the case of iron, levels in produce items ranged widely; in a sample of 48 oranges iron levels ranged from 0.1 to 0.6 mg/100 g. Hakala and others (2003) found that, for Finnish strawberries, variety and growing region had a greater influence on mineral and vitamin levels than whether the strawberries were grown using organic or non-organic cultivation methods. In this study, iron levels in ten different

types of strawberries varied from 0.3 to 0.6 mg/100 g, comparable to the difference in iron levels found at two time points in Australian samples.

It is clear that the difference in mineral levels between Australian samples studied in 1981-85 and those in 2000-01, with the exception of corn, is consistent with the variation reported in overseas and Australian studies where this variation is known.

For corn sampled in Germany, Scherz & Senser (1994) report a range in the levels of iron of 0.3-0.7 mg/100 g for different samples, in potassium of 269-340 mg/100 g, calcium of 2-9 mg/100 g, magnesium of 27-56 mg/100 g, sodium of 0.2-0.5 mg/100 g and zinc of 0.6-1 mg/100 g. For US corn, the relative standard error for iron, calcium, potassium and sodium and zinc was less than 10% of the mean, with the relative standard error for sodium at 20% of the mean (USDA 2004). These mineral ranges are smaller than those found for corn in this study. The substantially changed mineral profile for corn purchased in 2000 compared to that purchased in the 1980s suggests that corn variety has changed over this time. It may also reflect a different time of purchase (winter in 2000, 'in season' – presumably summer or autumn when corn supplies peak - in the 1980s) and hence different growing regions.

All analytical procedures are themselves subject to variation and uncertainty. AGAL reported a relative percentage difference between duplicate fruit and vegetable samples of between 1 and 3% for the minerals analysed and recoveries in the range 78 and 103% of spiked blank and matrix samples and of reference material. Comparable information for the samples analysed in the 1980s is not available but, as some of the results reported in the 1980s were of values close to the assumed limit of reporting, it is likely that these earlier results may be associated with greater analytical uncertainty. This is particularly the case for iron and zinc values which were generally less than 0.5 mg/100 g and it is possible that the slightly higher mean zinc and iron contents found in the 1980s samples reflect a less sensitive analytical method (AAS) and greater measurement uncertainty. With the more sensitive analytical method now used for iron and zinc (ICPMS), the slightly lower values measured in 2000-01 may in fact more accurately represent iron and zinc levels in the fruits and vegetables analysed rather than reflecting any real decline in levels of these two minerals.

There are a number of important limitations with this study. Firstly, the samples have been purchased in different locations in Australia (Sydney vs Melbourne), sometimes in different seasons, possibly at different stages of ripeness and almost certainly from different growing regions with different soil and climatic conditions. For tomato, apple, orange and banana, the values reported in the 1980s represent the mean of samples collected over a 12 month period, compared to levels measured at a single time in the year for the 2000-01 samples. Another important limitation of this study is that the two analytical programs used substantially different analytical methods. For these reasons, caution must be applied in any comparisons, even between produce of the same variety.

With the exception of potassium intake, fruits and vegetables generally are not major contributors to Australians' intake of the six minerals studied. Their relative contribution is generally greatest in adult females, who consume a higher proportion of their overall diets as fruit and vegetables and would be likely to be greater among vegetarians than non-vegetarians. In the 1995 National Nutrition Survey (McLennan & Podger 1998), fruit products/dishes and vegetable products/dishes together contributed less than 20% of adult female calcium, magnesium, iron and zinc intake, and 36% of potassium intake. The minor differences found in this study, even if they represent real differences rather than artefacts of

sampling and analysis, would have little nutritional significance in the context of the overall Australian diet.

Conclusion

The results of this study do not indicate that there have been significant changes in the mineral content of common types of fruits and vegetables available in Australia.

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Table 1. Mineral levels (mg/100 g) in the edible portion of raw fruits and vegetables purchased in Australia in 1981-85 and 2000-01 according to variety where known. *Values in italics represent ranges of values between or within varieties of the same food*.

Food Item, cultivar where known, description	Year of purchase	Potassium mg/100g	Sodium mg/100g	Calcium mg/100g	Magnesium mg/100g	Iron mg/100g	Zinc mg/100g
Apple, Red Delicious, unpeeled, cored	2000	100	1	4	5	0.1	Tr[2]
Apple, Red Delicious, unpeeled, cored	1982	110	1	5	4	0.2	0.1
Apple, Granny Smith, unpeeled, cored	2000	120	2	5	5	0.1	0.1
Apple, Granny Smith, unpeeled, cored	1982	110	1	5	4	0.2	0.1
Apple, Golden Delicious, unpeeled, cored	2000	28	0	1	1	Tr	Tr
Apple, Golden Delicious, unpeeled, cored	1983	74	2	3	4	0.2	0.1
Avocado, peeled and stoned, Hass	2000	490	6	8	28	0.5	0.6
Avocado, peeled and stoned, Hass	1983-84	480	2	14	23	0.7	0.5
Banana, Cavendish, flesh only	2000	330	0	5	33	0.3	0.2
Banana, Cavendish, flesh only	1982-83	350	1	5	19	0.5	0.2
Bean, green, excludes stem and tips	2000	220	1	52	33	1.0	0.3
Bean, green, excludes stem and tips	1982	200	3	42	25	1.0	0.7
Broccoli, common, flower head, upper stem	2000	340	24	36	22	0.8	0.5
Broccoli, common, flower head, upper stem	1982	360	21	31	22	1.0	0.7
Cabbage, common, green (excludes Savoy), leaf	2000	250	15	37	14	0.4	0.2

[2] Tr = Trace value, representing values less than 0.05 mg/100 g

Food Item, cultivar where known, description	Year of purchase	Potassium mg/100g	Sodium mg/100g	Calcium mg/100g	Magnesium mg/100g	Iron mg/100g	Zinc mg/100g
head							
Cabbage, common, white (excludes Savoy), leaf head	1982	330	18	35	15	0.6	0.3
Capsicum, green, flesh and skin	2000	240	2	11	14	0.5	0.2
Capsicum, green, flesh and skin	1983-84	130	2	8	9	0.7	0.3
Capsicum, red, flesh and skin	2000	160	2	6	9	0.3	0.1
Capsicum, red and Long Red Cayenne, flesh and skin	1983-84	180	1	2	2	0.3	0.4
Carrot, mature, unpeeled	2000	320	38	32	15	0.3	0.2
Carrot, mature, peeled	1983-84	260	43	31	10	0.3	0.2
Cauliflower, flower head	2000	280	50	23	18	0.4	0.2
Cauliflower, flower head, stem	1982	340	15	14	13	0.6	0.3
Celery, stem	2000	280	110	51	13	0.3	0.2
Celery, stem	1983-84	250	88	36	7	0.2	0.3
Corn, sweet, kernels	2000	250	0	3	34	0.5	0.6
Corn, sweet, kernels	1983-84	530	3	22	13	2.1	0.8
Cucumber, Greenridge, unpeeled, ends removed	2000	120	2	19	11	0.3	0.1
Cucumber, Green, unpeeled, whole fruit	1983-84	120	18	12	13	0.1	0.2
Grape, green, composite of Menindee Seedless,	2000	230	2	16	10	0.4	0.1

Food Item, cultivar where known, description	Year of purchase	Potassium mg/100g	Sodium mg/100g	Calcium mg/100g	Magnesium mg/100g	Iron mg/100g	Zinc mg/100g
Thomson Seedless and Sultana							
Grape, green, mean and range of Sultana, Waltham Cross	1983-85	200 *180-210*	6 *6-6*	12 *12-12*	14 *6-14*	0.2 *0.2-0.2*	0.1 *0.1-0.1*
Grape, Red Globe, seeds included	2000	270	5	10	8	0.4	0.2
Grape, Black, mean and range of Cornichon, Ruby seedless, Black Muscats	1983-84	170 *150-190*	5 *3-8*	8 *5-11*	8 *8-9*	0.2 *0.2-0.3*	0.1 *0.1-0.1*
Kiwifruit, Hayward, NZ grown, peeled, 'button' removed	2000	290	2	32	17	0.3	0.1
Kiwifruit, NZ grown, peeled	1983-84	280	6	24	17	0.5	0.2
Lettuce, iceberg/crisphead, inner leaves	2000	180	30	24	15	0.6	0.2
Lettuce, common (excludes cos and mignonette), inner leaves	1983-84	230	23	16	8	0.6	0.2
Mandarin, Imperial, peeled, pith and seeds removed	2000	160	2	32	11	0.1	Tr
Mandarin, Imperial, peeled, pith and seeds removed	1983-84	130	3	27	13	0.4	0.1
Mandarin, mean and range of Imperial, Murcott and Ellendale, peeled, pith and seeds removed	2000	160 *160-170*	2 *2-2*	42 *32-48*	12 *11-13*	0.1 *0.1-0.2*	0.1 *Tr-0.1*
Mandarin, mean of Imperial, Tangelo and Tangor, peeled, pith and seeds removed	1983-84	140 *130-150*	3 *2-4*	25 *22-27*	10 *9-10*	0.3 *0.2-0.4*	0.2 *0.1-0.3*
Mango, composite of Kensington Pride, Keilt, Pete's Pride, Colooka Gold, Debs Gold, peeled	2001	160	1	8	10	0.2	0.1
Mango, Kensington Pride, peeled	1983-84	250	1	7	7	0.5	0.3
Mushroom, cultivated small caps or button, end of	2000	320	8	4	11	0.3	0.9

Food Item, cultivar where known, description	Year of purchase	Potassium mg/100g	Sodium mg/100g	Calcium mg/100g	Magnesium mg/100g	Iron mg/100g	Zinc mg/100g
stalk removed							
Mushroom, mean of button and umbrella, whole	1983-84	320 *300-330*	8 *7-8*	3 *2-3*	9 *9-9*	0.2 *0.2-0.2*	0.3 *0.2-0.4*
Nectarine, composite of Red Glen, Flavour Top, Summer Bright, Flame Kist, Red Gold, Summer Fire, Fairlane, Zee Gold, Fantasia and August Red, unpeeled	2001	240	1	6	11	0.3	0.1
Nectarine, mean and range of Goldmine, Nectared, Redgold, P6, unpeeled	1981-82	230 *220-240*	1 *0-1*	8 *6-11*	7 *6-8*	0.1 *0.1-0.2*	0.1 *0.1-0.1*
Onion, white skinned, mature, peeled	2000	180	6	41	15	0.2	0.2
Onion, White Spanish (white skinned), mature, peeled	1982	190	21	19	12	0.4	0.3
Onion, brown skinned, mature, peeled	2000	220	12	32	15	0.4	0.3
Onion, Creamgold (brown skinned), mature, peeled	1983-84	130	11	18	4	0.4	0.1
Orange, Navel, peeled, pith and seeds removed	2000	170	3	39	13	0.2	0.1
Orange, mean and range of Washington and Lang Navels, peeled, pith and seeds removed	1983-84	150 *140-150*	3 *3-3*	29 *23-34*	11 *11-11*	0.4 *0.3-0.4*	0.2 *0.1-0.2*
Orange, Valencia, peeled, pith and seeds removed	2000	190	2	53	17	0.2	0.1
Orange, Valencia, peeled, pith and seeds removed	1983-84	140	2	32	11	0.4	0.2
Pea, green, excludes pods and stalk	2000	280	1	28	35	1.8	1.1
Pea, green, excludes pods	1982	250	2	31	30	1.8	1.0

Food Item, cultivar where known, description	Year of purchase	Potassium mg/100g	Sodium mg/100g	Calcium mg/100g	Magnesium mg/100g	Iron mg/100g	Zinc mg/100g
Peach, composite of Zee Sweet, Yellow 204, Peach 204, Zee Lady, Early O'Henry, YP, Golden Queen and O'Henry, unpeeled	2001	230	1	5	11	0.3	0.1
Peach, mean and range of Blackburn, Cardinal, Elberta, Fragar, Halehave, JH Hale, Maygold, Redhaven, unpeeled	1981-82	190 *170-220*	2 *1-2*	6 *4-9*	6 *6-7*	0.2 *0.1-0.4*	0.1 *0.1-0.1*
Pear, Packham, green, unpeeled, cored	2001	120	1	8	7	0.1	0.1
Pear, Packham, green, unpeeled, cored	1983	83	2	4	6	0.2	0.1
Pear, Williams/Bartlett, green, unpeeled	2001	140	1	6	7	0.1	0.1
Pear, Williams/Bartlett, green, unpeeled	1983	95	2	6	7	0.2	0.1
Pineapple, Smooth Cayenne, peeled, cored	2001	130	0	9	13	0.2	0.1
Pineapple, Smooth Cayenne, peeled	1983-84	180	2	27	11	0.3	0.2
Plum, red flesh, composite of Mariposa, Santa Rosa, La Roda, unpeeled	2001	160	2	5	9	0.1	0.1
Plum, red flesh, mean and range of Blood, Mariposa, Santa Rosa, unpeeled	1981-82	170 *140-190*	2 *2-3*	7 *6-8*	6 *4-7*	0.3 *0.2-0.4*	0.1 *0.1-0.1*
Plum, yellow flesh, composite of Tegan Blue, Black Amber and Hunter, unpeeled	2001	180	1	5	9	0.1	0.1
Plum, yellow flesh, mean of Narrabeen, Wilson, unpeeled	1981-82	140 *120-160*	1 *0-1*	7 *6-7*	5 *4-6*	0.2 *0.1-0.2*	0.1 *0.1-0.1*
Potato, Coliban (pale skin), peeled	2000	380	4	3	19	0.5	0.2
Potato, Sebago (pale skin), peeled	1982-83	410	2	3	20	0.6	0.4

Food Item, cultivar where known, description	Year of purchase	Potassium mg/100g	Sodium mg/100g	Calcium mg/100g	Magnesium mg/100g	Iron mg/100g	Zinc mg/100g
Potato, Desiree (red skin), peeled	2000	400	5	6	20	0.2	0.3
Potato, Pontiac (red skin), peeled	1982-83	380	2	4	19	0.5	0.4
Pumpkin, Butternut, peeled, seeded	2000	280	1	13	18	0.2	0.2
Pumpkin, Butternut, peeled, seeded	1983-84	470	1	23	16	0.4	0.1
Pumpkin, Jarrahdale, peeled, seeded	2000	250	1	19	12	0.3	0.2
Pumpkin, mean and range of Queensland Blue, Golden Nugget and Butternut, peeled, seeded	1983-84	350 *230-470*	1 *1-3*	29 *22-41*	12 *6-16*	0.5 *0.2-0.9*	0.2 *0.1-0.3*
Rockmelon, peeled, seeded	2001	270	22	9	15	0.2	0.2
Rockmelon, Ogen European, peeled, seeded	1983-84	190	10	7	4	0.3	0.1
Strawberry, destemmed, tops removed	2001	170	1	19	13	0.3	0.1
Strawberry, destemmed	1982-85	130	6	13	8	0.6	0.2
Tomato, common (excludes hydroponic, Roma and cherry tomatoes), includes stem scar tissue	2000	200	5	13	11	0.2	0.1
Tomato, Floradade, excludes stem scar tissue	1982-83	200	6	8	10	0.3	0.2
Watermelon, peeled, composite of varieties with or without seeds (Dragon Heart), flesh only	2001	150	2	6	14	0.3	0.1
Watermelon, peeled, round and oval fruit, flesh only	1983-84	87	2	6	4	0.4	0.4
Zucchini, green, unpeeled, excludes stem	2000	250	1	18	19	0.4	0.4
Zucchini, Blackjack (green skin), unpeeled, excludes stem	1983-84	150	1	19	15	0.6	0.3

Food Item, cultivar where known, description	Year of purchase	Potassium mg/100g	Sodium mg/100g	Calcium mg/100g	Magnesium mg/100g	Iron mg/100g	Zinc mg/100g
Mean	**2000-01**	**230**	**9**	**18**	**15**	**0.3**	**0.2**
	1981-85	**220**	**8**	**16**	**11**	**0.5**	**0.3**