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The evolution of food composition databases in Australia: applying data from 1944 to 2007 to current day dietary records

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Abstract

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The evolution of food composition databases in Australia: Applying data from 1944-2007 to current day dietary records

Original research

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The evolution of food composition databases in Australia: Applying data from 1944-2007 to current day dietary records

Abstract:

Pre 1980, Australian food composition data were printed tables and based largely on overseas values. Improvements in analytical methods, available technology and changes to the food supply led to a transition to electronic and later online databases. Dietary analysis of food intake data can be completed using food composition databases with very few users drawing on printed food composition tables. This study aimed to examine the nutrient output from different food composition data tables from 1944-2007 and describe the challenges faced when applying it to a present day dietary intake dataset from 2013. A two-step process was applied to analyse baseline food record data from the feasibility study of an interdisciplinary lifestyle intervention trial using food composition databases from 1944, 1948, 1954, 1968, 1977, 1991, 1999 and 2007. Differences in food data across all time points were determined with 2007 as the comparator database. Data were available for protein, fat, carbohydrate, thiamin, vitamin C, calcium and iron across the eight databases however nutrient data were not compared due to a lack of food matches between the databases. Differences in reported food composition data over time emphasizes the importance of using timely food composition data matched to the time period of the dietary intake data.

Keywords: food composition; nutrition assessment; history; database; food analysis

1. Introduction

Food composition databases provide comprehensive information about the amount of various nutrients found in foods. Food composition databases have multiple uses such as assessing the nutritional status of individuals and population groups, formulation of appropriate diets for therapeutic and institutional purposes i.e. hospitals and schools, identifying nutrition education strategies and health promotion needs, food and nutrition training and developing nutrition information for labelling (Church, 2006). Food composition databases are also an essential component of nutrition monitoring and surveillance and many food-health related studies (Cashel & Greenfield, 1995b; Cunningham, Tompsett, Abbey, Sobolewski, & Mackerras, 2010).

Australian food composition data has changed substantially since its early beginnings in 1938 (Commonwealth of Australia, 1938). Prior to the 1980s, Australian food composition data were in printed tables and based largely on overseas data (Cashel & Greenfield, 1996) from the United States (US) (U.S. Department of Agriculture, 1976) and United Kingdom (UK) (Paul & Southgate, 1978) food tables. Overseas values were incorporated as the Australian tables had limited data on foods and nutrients and it was thought that the health problems and food patterns between the US, UK and Australia were similar (Cashel & Greenfield, 1995b). There was also limited quantitative evidence to suggest that inappropriate food composition data had the potential to weaken the research and nutrition approaches within the Australian population (Cashel & Greenfield, 1995b). During the mid-1980s university researcher and the Commonwealth of Australia interest in the Australian food supply led to the development of the Composition of Foods Australia (Cunningham, et al., 2010). This seven volume series of printed food data was specific to Australian foods and collated primarily from laboratory analyses of foods (Probst & Cunningham). Improvements in analytical methods, available technology and changes to the food supply led to the

transition from printed data tables to computerized Australian food composition databases to cater for the growing number of foods (Cunningham, et al., 2010).

The first computerized database in Australia was the national reference food composition database, NUTTAB (Nutrient Tables) which was released in 1989 on external media, specifically a 3.5" floppy disk. One decade later, saw the release of the national survey database, AUSNUT (Australian Food and Nutrients database) in 1999 (Champagne & Wroten, 2012; Cunningham, et al., 2010). The transition from printed tables to food composition databases and the influx of computing technology (including software programs and the Internet) led to very few users drawing on printed Australian food composition tables to determine the nutrient output for food intake data.

Research comparing food composition databases in Australia is limited with the relevant research dating back to the 1990s. For example, comparisons of food composition data between the 1970s and early 1990s illustrated change in the gross composition of meat, primarily total fat (Cashel & Greenfield, 1995b, 1996). These changes were noted to be driven by consumer demand and the resulting change to agricultural and butchering practices required to meet this demand. (Cashel & Greenfield, 1995b, 1996). Changes in other nutrients were also observed between the 1970s and early 1990s. These changes were due, in part, to the fact that the earlier food composition tables were comprised mainly of foreign data whereas newer tables utilized chemically analyzed data from Australian foods. (Cashel & Greenfield, 1996).

Additional research identified the difference in food and nutrient availability in Australia when comparing the Composition of Foods Australia (1989) with the international composition tables from the UK (1978) (Paul & Southgate, 1978) and US (1976) (U.S. Department of Agriculture, 1976). Food sources were chemically analyzed to distinguish variances in the different tables, with iron and zinc values higher in the UK and US tables and

vitamin C, retinol activity and magnesium values higher in the Australian tables for all food sources examined (Cashel & Greenfield, 1995b). Estimates of food and nutrients varied considerably between the different tables due to the different methods of analysis, modes of expression and missing data (Cashel & Greenfield, 1995b). The study concluded that the use of overseas data produced significant errors in the assessment of nutrients in the Australian food supply.

The majority of the relevant research within the 1990s identified the importance of using Australian data as opposed to international data (Cashel & Greenfield, 1995b). It can be predicted from these earlier studies that the nutrients will vary considerably between food composition databases comprised of overseas food data (1944-1977) and data comprised of primarily Australian foods (1991-2007). This study aimed to examine the nutrient output from the different food composition tables (1944-2007) and the challenges faced when applying it to a present day dietary intake dataset. It was hypothesized that the nutrient output from the food composition tables with high proportions of overseas data would have increasing challenges in finding suitable food matches and differ. These tables would also result in larger differences nutrient output compared with food composition tables from with higher proportions of Australian foods. The importance of this study was to provide insight into changes that need to be considered when comparing nutrient data between the Australian food composition datasets.

2. Materials and Methods

2.1. Converting data

A two-step process was applied to allow for analysis of the dietary intake data using AUSNUT2007 (including AUSNUT2007 foods, brands and supplements) and AUSNUT1999 (including AUSNUT 1999 brands for brand name food items) databases,

English & Lewis 1991, Thomas & Corden 1977, Osmond & Wilson 1961, 1954 and 1948 and Marston and Dewbarn 1944 printed data tables. The databases AUSNUT 1999 and 2007 are survey databases and were directly based on foods reported in the National Nutrition Survey (NNS) for which they were created (Sobolewski, Cunningham, & Mackerras, 2010). AUSNUT 2007 contained the greatest number of food items and beverages (n=7835) with the data based on the 2006/07 Australian Children's Nutrition and Physical Activity Survey (Sobolewski, et al., 2010). Since the time of this study, the AUSNUT2011/13 survey database has been released though was not yet incorporated into the FoodWorks software package at the time of publication. AUSNUT 1999 was the first publicly available survey database and contained n=4554 food items and beverages based on the 1995 Australian NNS only. Availability of food items were considerably higher in the AUSNUT databases as data is sourced from the NUTTAB reference database, recipes and unpublished data, as well as imputed and calculated data from the nutrition surveys. This leads to a high proportion of the data not being based on chemical analyses (as primarily found in NUTTAB) (Australian Food, Supplement & Nutrient Database 2007 for estimation of population nutrient intakes - Explanatory Notes 2008). AUSNUT 2007 was the most up-to-date database available at the time of this study, and was therefore used as the standard of reference for comparative analyses to ensure continuity of data entry for each time period.

1) Printed food composition tables (1944-1991) were transcribed to Microsoft Excel (2010, Microsoft Corporation, USA) by scanning to a PDF file format and application of text recognition using Adobe Acrobat X Pro (v10.1.3, 2011, Adobe Systems Incorporated). Data were manually cleaned in accordance with software requirements (Table 1) as applicable to the full range of data available for each table. Newly developed databases were combined with existing electronic databases (1999-2007) already in current and previous versions of the nutrient analysis software, FoodWorks (version 7 2012; Xyris, Spring Hill QLD, Australia).

2) The newly developed (1944, 1948, 1954, 1968, 1977, 1991) and existing food composition databases (1999 and 2007) were used via FoodWorks software.

2.2. Nutrient intake data from a lifestyle intervention feasibility study

Baseline food record data from a feasibility study of an interdisciplinary lifestyle intervention trial conducted July and November 2013 were used. Results of the feasibility study have been published elsewhere (L. Tapsell et al., 2015; L. C. Tapsell, Lonergan, Martin, Batterham, & Neale, 2015) though in brief, the study aimed to recruit Illawarra/Shoalhaven residents aged between 25-54 years at risk of developing lifestyle related diseases. The dietary data for this study included baseline food data for 24 subjects from the feasibility study comprised of 18 completed paper-based food records. This study was not powered to detect changes in nutrient data but rather to explore the data using the novel application of time-based food composition data.

2.3. Data entry

The food records were analyzed repeatedly, using each of the food composition databases described above in 2.1 (1944-2007) via FoodWorks software. Foods were entered based on the closest conceptual match to the written record. Recipes were created when entering data into the AUSNUT 1999 database and reflected the food item entered into AUSNUT 2007 database (for example, a recipe to match the AUSNUT 2007 food item “Beef, stroganoff (steak, mushroom & sour cream casserole)” was created). Assumptions were made about common ingredients in order to create standard recipes for dishes reported in the food records. The same standard recipes were used for analyses, regardless of the database used. The standard recipes were created using the top three recipe websites for each food. Weight change factors were applied as per the AUSNUT 1999 database, retention factors were

applied as per the USDA 2003 values automatically by the Foodworks software. Yield factors were not applied to each recipe due to the likely differences in cooking methods over time.

Food items which could not directly be found in a database were 1) classified as missing data, omitted from the comparisons with the impacted database and categorised into food groups to indicate where differences existed over time 2) matched to another conceptually similar food item as written with one of a similar name to the standard to designate the most similar substitute within each database 3) listing of ingredient items to create a recipe-based approach where the ingredients were likely to change over time.

2.4. Data analysis

The nutrients protein, fat, carbohydrate, thiamin, vitamin C and iron were found to be common between the eight databases. Due to the missing data items statistical analyses could not be conducted, even when considered random missing data. Percentage differences between the common nutrients were calculated using Microsoft Excel (2010, Microsoft Corporation, USA) to represent the differences in dietary data in the absence of statistical analyses. The percentage difference was considered as the increase or decrease in nutrient output between each time point (1999, 1991, 1977, 1961, 1954, 1948, 1944). This involved firstly calculating the mean value for each of the nutrients available across all time points for all n=18 food records. The mean nutrient values from the 2007 database were used as the comparative data.

3. Results

The total number of food items available in each database differed at each time point between 1944 to 2007 (Table 2). The number of food items available increased with time. The 1944 database contained 165 food items whereas the 2007 database contained a total of 7835 available food items due to the inclusion of branded data as well as generic food items.

Data from the 1944 database had the greatest number of missing food item data points (n=265) with 30 percent of data missing from the total number of food items entered (n=878). Percentage data missing from the 1948, 1954 and 1961 databases were relatively similar (18.33 %, 17.48 %, and 17.22 %). For the 1977 and 1991 databases the percentage of missing data from the total number of food items entered was 9.33 % and 5.6 %, respectively (Table 3). For the 1999 database only n=7 food items were considered missing from the database.

The greatest percentage change was evident between 1944 and 2007. There was a percentage increase in protein, fat and carbohydrate (376 %, 282 %, 89 %, respectively) from 1944 to 2007 (Table 3). Mean protein was 110 g in 2007 and 23 g in 1944, for fat it was 84 g in 2007 and 22 g in 1944 and for carbohydrate it was 195 g in 2007 and 103 g in 1944. Of the macronutrients protein demonstrated the least variability over time. A percentage decrease was observed for vitamin C and iron (78 % and 51 %, respectively) from 1944 to 2007. The nutrient thiamin saw an increase of 99 % between 1991 and 2007. This percentage change was maintained until the 1948 dataset, a difference not likely to be considered nutritionally significant. A similar trend was seen for iron which was maintained to 1956 with differences varying 85-90%. The percentage changes for all other nutrients fluctuated remarkably between databases (Table 3) unlike the percentage missing data which increased in a linear manner.

4. Discussion

This is the first known study to examine the impact of different food composition tables (1944-2007) in Australia on output data. Transcribing historic food composition data in the form of printed tables into a database format allowed for its practical use when examining dietary intake data. It also displayed the differences between the data available over time. The

number of food items contained in the database varied substantially from only 165 in 1944 to 7835 in 2007. A linear increase in missing foods was found with time with the food categories that these missing foods contribute too changing only from 1961 onward. Interestingly, food items belonging to the spreads group were only missing in 1944 but comparable food matches were found for entries to the 1948-1999 databases. Minor differences in the preparation methods for missing fruit and vegetable food items were found from 1961 and 1977, respectively. Although a greater number of missing foods were expected, the extent of the differences were greater than anticipated. The difference between nutrient output from 2007 and nutrient tables from 1944-1991 can be explained by the variation of available food items per database (Table 2), with a tenfold increase in the number of foods available. During this time inclusion of a food depended greatly on the staple foods and commonly used ingredients (Sobolewski, et al., 2010).

Applying food data from 2013 to a food composition database from 1944 meant many of the food items could not be matched conceptually or nutritionally and not even by the development of a recipe. Ingredient items were not present in these early data sets to allow for this process to be completed. This continued to be a challenge for the 1948, 1954 and 1961 data as well. For this reason statistical analyses could not be conducted. A repeated measures ANOVA was planned with missing data considered in the model though the extent of the missing data did not allow for this data to be nutritionally or statistically relevant. Though it would have been ideal to use dietary intake data from the time of the earliest database this could not be sourced.

The process of converting the data did allow for proportionate comparisons to be made between three macro- and four micro-nutrients: protein, fat, carbohydrate, thiamin, vitamin C, calcium and iron. This demonstrated the importance of selecting the correct and timely database for the intake data analysis. A reference database for example would not be suited to

particular dietary assessment methods nor would a database from 1970 be suited to the analysis of intake data from 2000s. The large differences in the database construct between 1970 and 1999 further meant that statistical comparisons could not be undertaken as the 1977 database was considered a reference database comprised of the first analytical dataset for Australian foods since the 1940s (Probst & Cunningham).

Apart from the missing data at most time points, the decrease in carbohydrates content between 1977 and 1991 may also be due to differences in analytical methods. In 1977, carbohydrate data included fibre calculated by difference whereas in 1991 analyses involved high performance liquid chromatography (HPLC) which determined the measure of starch and sugars (Cashel & Greenfield, 1995b, 1996). The decrease in thiamin and calcium may be due to the 1977 database being based on overseas data (US and UK) in which wheat and rice products were fortified with thiamin and calcium (Cashel & Greenfield, 1995b, 1996). Mandatory fortification of thiamin was introduced to Australia in 1991. There is no mention of fortified wheat or rice products in the 1991 tables (NHMRC, 2005) with the values noted to be based on analytical programs in Australia over the past 12 years (R. English & J. Lewis, 1991).

The specificity and precision of the analytical methods have also improved over time. The 1944 tables acknowledged the chemical combinations in which iron occurs and aimed to provide data for 'available' iron, while values for vitamin C were noted to be comparable with those of other countries (Marston & Dawbarn, 1944). Contrary to this, the 1948 tables stated that it was not possible to provide data for 'available' iron and noted vitamin C to be recognized using 2,6 dichlorindophenol titrations (A. Osmond, 1948). The vitamin C approach was maintained for 1956, 1961 and 1977 data (A. Osmond & Wilson, 1954; A. Osmond & Wilson, 1966; Thomas & Corden, 1977) though by 1956 it was recognized that data for iron was not for 'available' but rather total intake iron (A. Osmond & Wilson, 1954).

From 1991 the AOAC microfluorometric method or HPLC methods were accepted to detect ascorbic acid and dehydroascorbic acid and adjustments were made to the values for processed meats, beers and wine in which ascorbate was added (R English & J Lewis, 1991). The data of this study did not seek to determine change in individual food items so such comparisons are made with caution. A similar study by Ahuja et al did compare the nutrient differences of food items using two different versions of the US Food and nutrient database for dietary studies (FNDDS) database. The study found difference in the contribution of nutrients from different food groups also suggesting the need for improved food composition data. The study did not consider food portions or weights (Ahuja, Goldman, & Perloff, 2006).

This study has demonstrated the evolution of Australian food composition data (databases and printed tables). When comparing the output obtained from the 2007 and 1999, data examined was found to be nutritionally similar (<14% difference). Due to the larger number of foods available and small percentage of missing data (0.00 % and 0.39 %), the AUSNUT databases were considered more suitable for analysis of the food records of this study. Both databases are considered survey databases developed with the intent of analysis of population-based nutrition surveys. The number of food items available at each time point however impacted on the ability to analyse the complete food intake data set (Table 2). Therefore comparison of even the two most recent databases should be taken with caution.

When comparing the mean nutrient outputs from the food records there was a small percentage difference for some nutrients between 2007 and 1999 which was expected given the close proximity in time. This pattern was not seen for the macronutrients protein and fat which showed larger percentage differences with more protein and less fat found for the 2007 data. It is assumed that this decreased fat is in the form of saturated fat though no comprehensive data exists for this time period to allow comparisons to be made. This downward shift also aligns with public health campaigns addressing the saturated fat content

of foods and it is likely a similar trend would be seen for sodium which was similarly targeted. Interestingly however, the mean macronutrients data was more comparable with the nutrient output from the 1977 database (protein 0.48 %, fat -4.36 % with 2007) which the authors believe is due in part to the increased size of the database from analytical data but also impacted by the missing data.

It was hypothesized that the nutrient output obtained from dietary intake analyses using more recent food composition tables (1991-2007) would differ from output obtained from older composition tables (1944-1977). The 1999 databases and the 1991 food composition table was derived from the chemical analyses of Australian foods [20], whereas, data from 1944 to 1977 was largely comprised of overseas data (Marston & Dawbarn, 1944; A. Osmond, 1948; A. Osmond & Wilson, 1954; A. Osmond & Wilson, 1966; Thomas & Corden, 1977). However due to the large number of missing food items between the databases the hypotheses could not be scientifically tested though it appears nutritional similarities between the analytical data are evident.

5. Conclusions

This study aimed to examine the output from eight different food composition data tables (1944-2007) and describe the challenges faced when applying it to present day dietary intake records. It can be argued that the variation in output between the databases can be due to the data input based solely on subjective professional judgement, which would be considered a significant limitation of dietary intake research generally. Despite this, to the need to apply the data to multiple databases was further impacted by the changing intent, content and approaches of each database being applied.

Implementation of printed food composition data in the form of current electronic software allowed for the analysis of present day nutrient data obtained from a feasibility study and compared output between databases (1944-2007). Ideally food intake data from 1940 should be compared to allow to these same databases to determine if reduced missing data substantially impact the nutrient outcomes. Such data was not available with a sample size required to test this statistically. Despite the limitations, this study has demonstrated the importance of transitioning food composition data to electronic databases to strengthen analysis of nutrient data. It has further demonstrated the changes in the Australian food composition tables likely to relate to changes in food supply and eating patterns over the past 60 plus years. Most importantly this study emphasizes the importance of using timely food composition data matched to the time period of the dietary intake data that has been collected.

Author note: The databases transcribed for the work of this project will be made available to licensed users of FoodWorks nutrient analysis software as an update.

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Table 1: Database requirements indicated for the upload transcriptions of printed data tables to FoodWorks nutrient analysis software (version 7, 2012).

Database Requirements

1. Apply an average for numerical ranges
 2. Apply food component identifiers for data interchange, TAGNAMES (Food and Agriculture Organization Agricultural and Consumer Protection Department, 2009), to nutrient descriptions
 3. Apply the factor of 4.1826 to convert calorie values to kilojoules
 4. Convert Carotene I.U. to Carotene μg ^a
 5. Convert edible matter as a percentage of purchased foods (%) to grams:
 - a) Calories per 100g^b
 - b) Kilojoules per 100g^c
 - c) Protein (grams)^d
 - d) Fat (grams)^e
 - e) Available Carbohydrate (grams)^f
 6. Convert Thiamin μg to Thiamin mg^g
 7. Convert Vitamin D I.U. to Vitamin D μg ^h
 8. Data validation of numbers and food descriptions with original database tables
 9. Field type of cells entered as numerical fields
 10. Historical spelling of 'thiamine' entered as 'thiamin'
 11. Removal of < or > symbols
 12. Treat data recorded as 'na' or 'tr' as a zero (0) valueⁱ
-

^a 1 I.U. = 0.6 gamma carotene from carotene (Osmond & Wilson 1954)

^b SUM(Calories x 0.45359237/10)

^c Calories per 100g/4.1826

^d Calories per 100g/4.1

^e Calories per 100/9.3

^f Calories per 100/3.75

^g 1 μg = 0.001 mg (Osmond & Wilson 1954)

^h 1IU (International Unit) = 0.025 μg Vitamin D (USDA: Dietary Supplement Ingredient Database – Unit conversions)

ⁱ 'na' = not analysed; 'tr' = trace amount analysed

1 **Table 2:** Difference between the food items entered for each time point using 1944-2007 food composition data.

Total	1944	1948	1954	1961	1977	1991	1999	2007
Total food items available, n=	165	212	277	278	761	1378	4554	7835
Food entried made, n=	878	1151	1167	1173	1479	1571	1795	1746
Missing food items, n= (% of entered)	265 (30.18)	211 (18.33)	204 (17.48)	202 (17.22)	138 (9.33)	88 (5.60)	7 (0.39)	0
Missing food categories								
• Alcoholic beverages	✓	✓	✓	✓	✓			
• Beverage bases liquid and dry including coffee and tea	✓	✓	✓	✓	✓	✓		
• Canned legumes	✓	✓	✓	✓	✓	✓		
• Carbonated beverages including soft drinks and soda	✓	✓	✓	✓		✓		
• Chips/crisps and popcorn	✓	✓	✓	✓	✓			
• Chocolate bars and confectionary	✓	✓	✓	✓	✓			
• Cooked/preserved/frozen vegetables and vegetable juice	✓	✓	✓	✓	✓ (excl. frozen)	✓ (excl. cooked and frozen)		
• Crackers, biscuits and baked goods	✓	✓	✓	✓	✓	✓		
• Custard, yoghurt, ice cream, sour cream		✓	✓	✓	✓			
• Deli meats	✓	✓	✓	✓				
• Dips, sauces and condiments	✓	✓	✓	✓	✓	✓	✓	
• Egg based dishes	✓	✓	✓	✓	✓			
• Ethnic dishes, accompaniments and ingredients	✓	✓	✓	✓	✓	✓	✓ (accompaniments only)	
• Flat, fortified and filled breads	✓	✓	✓	✓	✓	✓		
• Flavoured milks and dairy alternatives	✓	✓	✓	✓	✓			
• Fresh fruit, dried fruit, fruit juices	✓	✓	✓	✓ (excl. dried fruit)	✓ (excl. dried fruit)	✓ (excl. dried fruit and for nfs fruit only)		
• Grains and grain alternatives	✓	✓	✓	✓	✓	✓	✓	
• Herbs and spices	✓	✓	✓	✓	✓	✓	✓	
• Mixed dishes e.g. hamburgers	✓	✓	✓	✓	✓	✓		

• Pasta and noodle products	✓	✓	✓	✓	✓	✓	
• Prepared soups	✓	✓	✓	✓	✓	✓	
• Raw and roasted nuts and seeds	✓	✓	✓	✓	✓	✓ (excl. nuts)	
• Ready to eat cereal products	✓	✓	✓	✓	✓	✓	
• Soft and hard cheeses	✓	✓	✓	✓	✓	✓ (excl. hard cheese)	
• Specific cuts and preparation methods of meat	✓	✓	✓	✓	✓	✓	
• Specific types and preparation methods of seafood	✓	✓	✓	✓	✓	✓ (processed only)	✓ (processed only)
• Spreads (sweet and savoury)	✓						
• Unsaturated fats	✓	✓	✓	✓	✓	✓	

Table 3: Mean (% change) nutrients from n=18 food records between 2007 comparator database and 1999-1944 databases^a.

Database (year published)	2007	1999		1991		1977		1961		1954		1948		1944	
Protein (g)	110	97	(12)	92	(16)	109	(0)	76	(31)	71	(36)	68	(38)	23	(79)
Fat (g)	84	89	(19)	75	(32)	87	(21)	60	(45)	59	(46)	53	(52)	22	(80)
Carbohydrate (g)	195	199	(-81)	184	(-68)	240	(-119)	256	(-133)	244	(-122)	172	(-57)	103	(6)
Thiamin (mg)	2	1	(99)	1	(99)	1	(99)	1	(99)	1	(99)	1	(99)	3	(97)
Vitamin C (mg)	122	122	(-11)	106	(4)	133	(-21)	171	(-56)	166	(-51)	143	(-30)	553	(-403)
Calcium (mg)	828	838	(-663)	716	(-552)	670	(-510)	556	(-406)	551	(-401)	490	(-346)	1880	(-1611)
Iron (mg)	14	14	(87)	11	(90)	15	(86)	17	(85)	16	(86)	13	(88)	28	(75)

^a Data includes missing values for 7, 88, 138, 202, 204, 211, 265 food items