

**Supplementary Information**

Dietary Intake Assessment Report – Application A1156

Food derived from Super High Oleic Safflower Lines 26 and 40

# Executive summary

The Application seeks to amend the *Australia New Zealand Food Standards Code* (the Code) to allow for the inclusion of food derived from two lines of genetically modified super high oleic (SHO) safflower. The OECD Unique Identifiers for these sunflower lines are GOR-73226-6 and GOR-73240-2 (herein referred to as ‘SHO safflower’). As SHO safflower may be available for human consumption, FSANZ has assessed the potential increase in dietary intakes of oleic acid due to consumption of SHO safflower oil.

The dietary intake assessment used food consumption data from the 2011-12 Australian National Nutrition and Physical Activity Survey, the 2008 New Zealand Adult Nutrition Survey and the 2002 New Zealand National Children’s Nutrition Survey. As there were no identified target or at-risk groups, data were analysed for each survey population as a whole. To determine the baseline consumer dietary intake of oleic acid, concentrations of oleic acid in the Australian and New Zealand food supplies were determined primarily using data from Australia’s reference nutrient database (Food Standards Australia New Zealand, due for release in 2018). As oleic acid data in the USDA standard reference food composition database (National Agricultural Library, 2018) are more comprehensive, these data were used where FSANZ data were missing or the FSANZ value was zero. New Zealand food composition data were not used in this assessment. Concentrations of oleic acid in conventional and SHO safflower oils were provided by the applicant.

Consumer dietary intakes of oleic acid were estimated for *Baseline (unspecified oils are vegetable oil)*, *Baseline (unspecified oils are safflower oil)* and for two SHO scenarios. The first assumed that SHO safflower oil replaces all safflower oil in conjunction with the Baseline oleic acid dietary intakes (*100% SHO safflower oil* scenario) and the second assumed that all safflower and unspecified oils consumed are replaced by SHO safflower in conjunction with the baseline intakes (*100% SHO safflower oil plus 100% SHO unspecified oils* scenario).

Baseline intakes of oleic acid (from both baseline scenarios) ranged at the mean between 26-38 g/day and at the P90 between 42-67 g/day across the Australian and New Zealand population groups assessed. An increase in estimated intake was only shown when all safflower and unspecified oils were replaced with SHO safflower oil. Mean intakes increased by 3-4 g/day (8-13%) and P90 intakes increased between 5-9 g/day (9-14%). The increases in mean and P90 consumer dietary intakes of oleic acid are within the normal daily variation of intakes. The major contributor to oleic acid intakes is oils, ranging between 42-65% across the population groups assessed. This major contributor doesn’t change when SHO safflower oils are substituted into the diet, and the top end of the range increases to 69% contribution.

As the addition of SHO safflower oil makes little to no difference to oleic acid intakes it is concluded that consumption of SHO safflower will not pose a nutritional concern to the Australian and New Zealand populations.

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# Introduction

Application A1156 seeks to amend the *Australia New Zealand Food Standards Code* (the Code) to allow for the inclusion of food derived from two lines of genetically modified super high oleic (SHO) safflower. The OECD Unique Identifiers for these sunflower lines are GOR-73226-6 and GOR-73240-2 (herein referred to as SHO safflower). As SHO safflower may be available for human consumption, FSANZ has assessed the increase in dietary intake of oleic acid due to consumption of SHO safflower oil.

SHO safflower has been grown in Australia under limited and controlled conditions under Licence DIR158 from the Office of the Gene Technology Regulator. In addition to an increase in oleic acid, SHO safflower also contains decreased levels of linoleic acid and palmitic acid when compared with non-genetically modified safflower. The dietary intake assessment considers the intake of oleic acid from the current food supply (baseline intakes) and two scenarios to account for potential additional intake of oleic acid due to the introduction of SHO safflower oil.

# Dietary intake assessment

## Purpose

The purpose of this assessment is to estimate dietary intakes of oleic acid both currently and after the introduction of SHO safflower, should the application be approved. The general FSANZ methodology and approach to conducting dietary intake assessments is set out in *Principles and Practices of Dietary Exposure Assessment for Food Regulatory Purposes* (FSANZ, 2009).

## Nutrient of interest

The assessment focusses on estimated dietary intakes of oleic acid.

## Approach

Dietary intake assessments require data on the concentrations of the chemical of interest in the relevant foods, and consumption data for the foods that have been collected through a national nutrition survey.

The dietary intake of oleic was estimated using (1) current oleic acid concentrations in foods; (2) the potential increases in oleic acid concentrations in safflower oil through the introduction of SHO safflower oil to the Australian and New Zealand food supplies; and (3) food consumption data from the most recent Australian and New Zealand national nutrition surveys.

The dietary intake assessment was undertaken using FSANZ’s dietary modelling computer program, Harvest[[1]](#footnote-2). The Harvest model used to assess dietary intakes was a ‘raw commodity’ model. This type of model allows a single concentration to be assigned to a group of foods (e.g. all apples) or specific foods (e.g. cow’s milk, reduced fat cow’s milk, low fat cow’s milk) depending on the concentration data available. This model includes where the food is consumed in its own right (e.g. a glass of milk) or where the food was consumed as part of a mixed food (e.g. milk in a cup of tea, in custard, in a sauce etc.) using the Harvest recipe database. This ensures the dietary intake of oleic acid from all sources of a food is included.

Food consumption data used

The food consumption data used for the dietary intake assessments were:

* 2002 New Zealand National Children’s Nutrition Survey (2002 NZ CNS): a 24-hour recall survey of 3,275 New Zealand children aged 5-14 years, with a second 24-hour recall undertaken for 15% of respondents. The assessment only used data from Day 1 of the survey.
* 2008-09 New Zealand Adult Nutrition Survey (2008 NZ ANS): a 24-hour recall survey of 4,721 New Zealanders aged 15 years and above, with a second 24-hour recall undertaken for 25% of respondents. The assessment only used data from Day 1 of the survey.
* 2011-12 Australian National Nutrition and Physical Activity Survey (2011-12 NNPAS), a component of the 2011-13 Australian Health Survey (2011-13 AHS): a 24-hour recall survey of 12,153 Australians aged 2 years and above, with a second 24-hour recall undertaken for 64% of respondents. Only those respondents who had two days of food consumption data (n=7,735) were used in the assessment of dietary intakes (ABS, 2015).

Dietary intake assessments based on food consumption data from national nutrition surveys provide the best estimation of actual consumption of a food and the resulting estimated dietary intake assessment for the Australian and New Zealand populations. However, national nutrition survey data have some limitations. The design of these nutrition surveys vary and the key attributes of each, including survey limitations, are set out in Appendix 2.

As discussed in the A1156 Supporting Document 1 (SD1), there are no established health based guidance values for oleic acid and no target or at-risk populations were identified. SHO safflower oil has the potential to be consumed by all sectors of the Australian and New Zealand populations. For Australia, the population group used for the dietary intake assessment was the population aged 2 years and above. For New Zealand the population groups were children (aged 5-14 years) and adults (aged 15 years and above).

Concentrations of oleic acid in foods

Concentrations of oleic acid in the Australian and New Zealand food supplies were determined primarily using data from Australia’s reference nutrient database (Food Standards Australia New Zealand, due for release in 2018)(Food Standards Australia New Zealand, due for release in 2018). As oleic acid data in the USDA standard reference food composition database (National Agricultural Library, 2018) are more comprehensive, these data were used where FSANZ data were missing or the FSANZ value was zero (see Appendix 1). New Zealand food composition data were not used in this assessment.

The concentration of oleic acid in conventional safflower oil used in the dietary intake assessment was 759 g/kg, and for the SHO safflower lines was 921 g/kg (mean concentration of the two SHO Events). These safflower oil concentrations were provided by the Applicant.

Scenarios assessed

To estimate the potential changes in oleic acid intake in Australia and New Zealand from the introduction of SHO safflower, FSANZ used four scenarios to model potential dietary oleic acid intakes. The scenarios included current or baseline estimates (using concentration data from FSANZ and USDA as explained above) and then scenarios assessing intakes when regular vegetable oil or safflower oil were substituted with SHO safflower oil. The four scenarios were:

1. *‘Baseline (unspecified oils are vegetable oil)’*: Unspecified oil (vegetable oil reported as consumed in a nutrition survey without any specific information about its source) was assumed to be a generic vegetable oil
2. *‘Baseline (unspecified oils are safflower oil)’*: Unspecified oil (vegetable oil reported as consumed in a nutrition survey without any specific information about its source) was assumed to be safflower oil
3. *‘100% SHO safflower oil’*: SHO safflower oil replaces all (100%) conventional safflower oil that consumers reported eating in the national nutrition surveys. (Unspecified oils remain as vegetable oil).
4. *‘100% SHO safflower oil plus 100% SHO unspecified oils’*: SHO safflower oil replaces all (100%) of conventional safflower oil and 100% of any unspecified oil that consumers reported eating in the national nutrition surveys.

All four scenarios include where oil is reported as consumed on its own or as an ingredient in mixed foods or dishes (e.g. in salad dressing, steak fried in oil, fried rice etc.) based on FSANZ’s recipe data from the Harvest Raw Commodity model. Safflower oil was the only safflower commodity used in this assessment as no consumption of other safflower products (i.e. safflower meal or safflower seed) was reported in the nutrition surveys for Australia and New Zealand.

Assumptions and limitations of the dietary intake assessment

The aim of the dietary intake assessment was to make the best estimate of dietary oleic acid intake. Where significant uncertainties in the data exist, FSANZ uses conservative assumptions to ensure that the estimated dietary intake is not an underestimate (for example, assuming that all safflower oil consumption is SHO safflower oil will over-estimate the potential population increases in oleic acid intakes).

Assumptions made in the dietary intake assessment included:

* Oleic acid intakes are from food only; oleic acid intake from complementary or other medicines (e.g. dietary supplements) is not included
* The dietary intake assessments used the concentrations of oleic acid in SHO safflower oil and conventional safflower oil as provided by the Applicant. The variability and uncertainty around these concentrations are unknown
* All conventional safflower oil reported as consumed is replaced by SHO safflower oil (*100% SHO safflower oil* scenario)
* All unspecified oils currently in the marketplace are replaced by SHO safflower oil (*100% SHO safflower oil plus 100% SHO unspecified oil* scenario)
* The fatty acid profile of SHO safflower in the marketplace is the same as the Applicant’s data
* Where a food was assigned an oleic acid concentration, this concentration was carried over to mixed foods where the food had been used as an ingredient (e.g. meat used in homemade casseroles, milk in homemade cakes etc.)
* The oleic acid composition of foods in the USDA standard reference food composition database reflect the oleic acid composition of the same foods in the Australian and New Zealand food supplies
* The oleic acid composition of the New Zealand food supply is the same as the oleic acid composition of the Australian food supply.

In addition to the specific assumptions made in relation to this dietary intake assessment, there are a number of limitations associated with the nutrition surveys per se. A discussion of these limitations is included in Section 6 of the *Principles and Practices of Dietary Exposure Assessment for Food Regulatory Purposes* (FSANZ, 2009).

## Dietary intake assessment results and conclusion

Australia

The *Baseline (unspecified oils are vegetable oil)* estimated mean and 90th percentile (P90) consumer dietary intakes of oleic acid for Australians aged 2 years and above are 26 g/day and 42 g/day respectively.

For the *100% SHO safflower oil* scenario there are no increases in the estimated mean and P90 consumer dietary intakes of oleic acid from *‘Baseline (unspecified oils are vegetable oil)* (see Table 1 and Figure 1).

For the *100% SHO safflower oil plus 100% SHO unspecified oils* scenario for Australians aged 2 years and above, mean and P90 consumer dietary intakes of oleic acid increase above *Baseline (unspecified oils are safflower oil)* by 3 g/day (8%) and 5 g/day (9%) to 34 g/day and 56 g/day respectively (see Table 1 and Figure 1). Although the increase in oleic concentrations in the safflower oil shift the distribution of oleic acid intake upwards, the increases are within the normal daily variation of intakes.

New Zealand

The *Baseline (unspecified oils are vegetable oil)* estimated mean and P90 consumer dietary intakes of oleic acid for New Zealand children aged 5-14 years are 26 g/day and 43 g/day respectively. Estimated mean and P90 consumer dietary intakes of oleic acid for New Zealand adults aged 15 years of age and above are 29 g/day and 51 g/day respectively.

For the *100% SHO safflower oil s*cenario there are no increases above the *Baseline (unspecified oils are vegetable oil)* in the estimated mean and P90 consumer dietary intakes of oleic acid for New Zealand children aged 5-14 years and adults aged 15 years and above (see Table 1 and Figure 2).

For the *100% SHO safflower oil plus 100% SHO unspecified oils* scenario for New Zealand children aged 5-14 years of age, mean and P90 consumer dietary intakes increase above *Baseline (unspecified oils are safflower oil)* by 4 g/day (13%) and 9 g/day (14%) to 40 g/day and 70 g/day respectively. For New Zealand adults aged 15 years and above, increases in mean and P90 consumer dietary intake of oleic acid above *Baseline (unspecified oils are safflower oil)* are 4 g/day (11%) and 8 g/day (12%) to 42 g/day and 76 g/day respectively (see Table 1 and Figure 2). Although the increase in oleic concentrations in the safflower oil shift the distributions of oleic acid intake for both New Zealand children and adults upwards, the increases are within the normal daily variation of intakes.

In the *100% SHO safflower oil plus 100% SHO unspecified oils* scenario the true increase in population intakes of oleic acid would likely to be lower due to the conservative assumption that all unspecified oils consumed are safflower oil. The intake estimates are intentionally highly protective of consumers in order to make a determination about whether there is a public health and safety concern associated with SHO safflower oil increasing oleic acid intakes in Australia and New Zealand or not.

Table 1: Estimated mean and P90 oleic acid dietary intakes for Australia and New Zealand

| Country | Age group | No. of resp. | Proportion consumers to respondents | Estimated dietary intake of oleic acid (g/day) | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mean | | | | P90 | | | |
| Baseline (unspecified oils are vegetable oil) | 100% SHO safflower oil’ scenario | Baseline (unspecified oils are safflower oil) | 100% SHO safflower oil plus 100% SHO unspecified oils scenario | Baseline (unspecified oils are vegetable oil) | 100% SHO safflower oil scenario | Baseline (unspecified oils are safflower oil) | 100% SHO safflower oil plus 100% SHO unspecified oils scenario |
| Australia\* | 2 years and above | 7,735 | 100% | 26 | 26 | 31 | 34 | 42 | 42 | 51 | 56 |
| New Zealand∇ | 5-14 years | 3,275 | 100% | 26 | 26 | 35 | 40 | 43 | 43 | 62 | 70 |
|  | 15 years and above | 4,721 | 100% | 29 | 29 | 38 | 42 | 51 | 51 | 67 | 76 |

\* 2011-12 Australian National Nutrition and Physical Activity Survey. Based on consumption data from respondents with two days of data only.

**∇** 2002 New Zealand National Children’s Nutrition Survey and the 2008–09 New Zealand Adult Nutrition Survey. Based on day 1 consumption data only from all respondents.

Figure 1: Estimated mean and P90 oleic acid intakes for Australians aged 2 years and above

Figure 2: Estimated mean and P90 oleic acid intakes for New Zealand population groups

Major foods contributing to oleic acid dietary intakes

Major contributing foods are defined as those that contribute ≥5% to dietary intakes of oleic acid.

#### Australia

At *Baseline (unspecified oils are vegetable oil)* for Australians aged 2 years and above, Oils (42%) are the major contributing food category to oleic acid intakes from the diet. Within this category, Unspecified oil (25%) and Olive oil (10%) are the main contributors. Other major contributing food categories / groups to oleic acid intakes are Cattle milk including liquid milks, cheeses, yoghurt, cream and butter (17%), Mammalian meat, fat and offal (13%) (Cattle meat 7%), Nuts and seeds (8%) and Poultry meat, fat and offal (7%). For Australians, the major contributors to oleic acid to the diet do not change with the replacement of conventional safflower oil with SHO safflower oil in the *100% SHO safflower oil* scenario (see Table 2 and Figure 3).

At *Baseline (unspecified oils are safflower oil)* for Australians aged 2 years and above, the major contributors to oleic acid intakes are Oils (52%) (Unspecified oils 37%, Olive oil 9%), Cattle milk including liquid milks, cheeses, yoghurt, cream and butter (14%), Mammalian meat, fat and offal (11%) (Cattle meat 5%), Nuts and seeds (7%) and Poultry meat (6%). When safflower oil is replaced with SHO safflower oil (including unspecified oil) in the *100% SHO safflower oil plus 100% SHO unspecified oils* scenario, the major contributors to oleic acid in the diet remain the same with small changes in percentage contribution. Oils contributed 55% (Unspecified oils 42%; Olive oil 8%), Cattle milk including liquid milks, cheeses, yoghurt, cream and butter 13%, Mammalian meat, fat and offal 10% (Cattle meat 5%), Poultry meat 6%, and Nuts and seeds 6% (see Table 2 and Figure 3).

#### New Zealand

At *Baseline (unspecified oils are vegetable oil)* for New Zealand children aged 5-14 years, the major contributors to oleic acid to the diet are Oils (53%) (Unspecified oil 44%), Cattle milk including liquid milks, cheeses, yoghurt, cream and butter (19%), Mammalian meat, fat and offal (11%) (Cattle meat 7%) and Nuts and seeds (6%). Similarly, at *Baseline (unspecified oils are vegetable oil)* for New Zealand adults aged 15 years and above, the major contributors to oleic acid in the diet are Oils (47%) (Unspecified oil 36%), Cattle milk including liquid milks, cheeses, yoghurt, cream and butter (16%), Mammalian meat, fat and offal (13%) (Cattle meat 7%) and Nuts and seeds (7%). In both New Zealand national nutrition surveys, the major contributors to oleic acid in the diet do not change with the replacement of conventional safflower oil with SHO safflower oil in the *100% SHO safflower oil* scenario (see Table 3 and Figure 4).

At *Baseline (unspecified oils are safflower oil)* for New Zealand children aged 5-14 years, the major contributors to oleic acid in the diet are Oils (65%) (Unspecified oil 59%), Cattle milk including liquid milks, cheeses, yoghurt, cream and butter (14%) and Mammalian meat, fat and offal (8%) (Cattle meat 5%). In the *100% SHO safflower oil plus 100% SHO unspecified oils* scenario, the major contributors to oleic acid in the diet are similar: Oils (69%) (Unspecified oil 64%) and Cattle milk including liquid milks, cheeses, yoghurt, cream and butter (12%) and Mammalian meat, fat and offal (7%), however Cattle meat is no longer a major contributor (see Table 3 and Figure 4).

At *Baseline (unspecified oils are safflower oil)* for New Zealand adults aged 15 years and above, the major contributors to oleic acid in the diet are Oils (59%) (Unspecified oil (51%)), Cattle milk including liquid milks, cheeses, yoghurt, cream and butter (12%), Mammalian meat, fat and offal (10%) (Cattle meat 5%) and Nuts and seeds (5%). In the *100% SHO safflower oil plus 100% SHO unspecified oils* scenario, the major contributors to oleic acid in the diet remain the same with small variations in percentage contributions (Oils (63%) (Unspecified oil 56%), Cattle milk including liquid milks, cheeses, yoghurt, cream and butter(11%), Mammalian meat, fat and offal (9%) (Cattle meat 5%) and Nuts and seeds (5%)) (see Table 3 and Figure 5).

Conclusion

As discussed in the A1156 SD1, oleic acid is non-essential and there are no health based guidance values. As the addition of SHO safflower oil makes little to no difference to oleic acid intakes and food contributors it is concluded that consumption of SHO safflower will not pose a nutritional concern to the Australian and New Zealand populations.

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Table 2: Food contributors to oleic acid dietary intakes for Australians aged 2 years and above, based on Day 1 and 2 of the 2011-12 NNPAS

| Classification Name | % Contribution | | | |
| --- | --- | --- | --- | --- |
| Baseline (unspecified oils are vegetable oil) | 100% SHO safflower oil scenario | Baseline (unspecified oils are safflower oil) | 100% SHO safflower oil plus 100% SHO unspecified oils scenario |
| Amphibians & reptiles | 0 | 0 | 0 | 0 |
| Cereals | 4 | 4 | 3 | 3 |
| Coffee & guarana | <1 | <1 | <1 | <1 |
| Fruits | 2 | 2 | 2 | 2 |
| Honey | 0 | 0 | 0 | 0 |
| Mammalian meat, fat & offal | 13 | 13 | 11 | 10 |
| *Cattle meat* | 7 | 7 | 5 | 5 |
| Milk & dairy products | 18 | 18 | 15 | 14 |
| *Cattle milk including liquid milks, cheeses, yoghurt, cream and butter* | 17 | 17 | 14 | 13 |
| Miscellaneous foods | <1 | <1 | <1 | <1 |
| Nuts & seeds | 8 | 8 | 7 | 6 |
| *Peanut (Groundnut)* | 2 | 2 | 2 | 2 |
| Oils | 42 | 42 | 52 | 55 |
| *Unspecified oil* | 25 | 25 | 37 | 42 |
| *Olive oil, refined* | 10 | 10 | 9 | 8 |
| Poultry eggs | 2 | 2 | 2 | 2 |
| Poultry meat, fat & offal | 7 | 7 | 6 | 6 |
| *Chicken meat* | 5 | 5 | 4 | 4 |
| Seafood | 2 | 2 | 1 | 1 |
| Sugars & cocoa products | <1 | <1 | <1 | <1 |
| Teas | <1 | <1 | <1 | <1 |
| Vegetables, herbs & spices | 1 | 1 | <1 | <1 |

Note: grey shading indicates a major contributing food category or food group (≥5%)

\* Other includes amphibians and reptiles, cereals, coffee and guarana, fruits, honey, poultry eggs, seafood, sugars and cocoa products, teas, vegetables, herbs and spices, miscellaneous foods.

Figure 3: Major food contributors to oleic acid dietary intakes for Australians aged 2 years and above, based on Day 1 and 2 of the 2011-12 NNPAS

Table 3: Food contributors to oleic acid dietary intakes for New Zealand population groups, based on Day 1 of the national nutrition survey, for general population groups\*

| Classification Name | % Contribution | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 5-14 years | | | | | 15 years and above | | | |
| Baseline (unspecified oils are vegetable oil) | 100% SHO safflower oil scenario | Baseline (unspecified oils are safflower oil) | 100% SHO safflower oil plus 100% SHO unspecified oils’ scenario | Baseline (unspecified oils are vegetable oil) | | 100% SHO safflower oil scenario | Baseline (unspecified oils are safflower oil) | 100% SHO safflower oil plus 100% SHO unspecified oils’ scenario |
| Amphibians & reptiles | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Cereals | 3 | 3 | 2 | 2 | 3 | | 3 | 3 | 2 |
| Coffee & guarana | <1 | <1 | <1 | <1 | <1 | | <1 | <1 | <1 |
| Fruits | <1 | <1 | <1 | <1 | 2 | | 2 | 2 | 2 |
| Honey | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Mammalian meat, fat & offal | 11 | 11 | 8 | 7 | 13 | | 13 | 10 | 9 |
| *Cattle meat* | 7 | 7 | 5 | 4 | 7 | | 7 | 5 | 5 |
| Milk & dairy products | 19 | 19 | 14 | 12 | 16 | | 16 | 13 | 11 |
| *Cattle milk including liquid milks, cheeses, yoghurt, cream and butter* | 19 | 19 | 14 | 12 | 16 | | 16 | 12 | 11 |
| Miscellaneous foods | <1 | <1 | <1 | <1 | <1 | | <1 | <1 | <1 |
| Nuts & seeds | 6 | 6 | 4 | 4 | 7 | | 7 | 5 | 5 |
| *Peanut (Groundnut)* | 4 | 4 | 3 | 3 | 3 | | 3 | 2 | 2 |
| Oils | 53 | 53 | 65 | 69 | 47 | | 47 | 59 | 63 |
| *Unspecified oil* | 44 | 44 | 59 | 64 | 36 | | 36 | 51 | 56 |
| *Olive oil, refined* | 3 | 3 | 2 | 2 | 4 | | 4 | 3 | 3 |
| Poultry eggs | 2 | 2 | 1 | 1 | 3 | | 3 | 2 | 2 |
| Poultry meat, fat & offal | 3 | 3 | 2 | 2 | 4 | | 4 | 3 | 3 |
| *Chicken meat* | 3 | 3 | 2 | 2 | 4 | | 4 | 3 | 3 |
| Seafood | 1 | 1 | 1 | <1 | 2 | | 2 | 2 | 2 |
| Sugars & cocoa products | <1 | <1 | <1 | <1 | <1 | | <1 | <1 | <1 |
| Teas | <1 | <1 | <1 | <1 | <1 | | <1 | <1 | <1 |
| Vegetables, herbs & spices | <1 | <1 | <1 | <1 | <1 | | <1 | <1 | <1 |

Note: grey shading indicates a major contributing food category or food group (≥5%)

\* 2002 New Zealand National Children’s Nutrition Survey (2002 NZ CNS) 5-14 years; 2008/09 New Zealand Adult Nutrition Survey (2008 NZ ANS) 15 years and above

\*Other includes amphibians and reptiles, cereals, coffee and guarana, fruits, honey, poultry eggs, seafood, sugars and cocoa products, teas, vegetables, herbs and spices, miscellaneous foods

Figure 4: Food contributors to oleic acid dietary intakes for New Zealand, based on Day 1 of the 2002 NZ CNS, for children aged 5-14 years

\*Other includes amphibians and reptiles, cereals, coffee and guarana, fruits, honey, poultry eggs, seafood, sugars and cocoa products, teas, vegetables, herbs and spices, miscellaneous foods

Figure 5: Food contributors to oleic acid dietary intakes for New Zealand, based on Day 1 of the 2008 NZ ANS, for adults aged 15 years and above

References

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Food Standards Australia New Zealand (due for release in 2018), *Australian Food Composition Database, Release 1*, Food Standards Australia New Zealand, Canberra, Australia.

FSANZ (2009), *Principles and practices of dietary exposure assessment for food regulatory purposes*, Canberra, Australia.

National Agricultural Library (2018), *USDA Food composition database*, United States Department of Agriculture Agricultural Research Service.

# Appendix 1: Oleic acid concentrations used for the dietary intake assessment

Table A1.1: Oleic acid concentrations used for the dietary intake assessment

| Classification code | Classification name | Oleic acid concentration (g/kg)\* | Source |
| --- | --- | --- | --- |
| AP0001 | Honey | 0 | FSANZ |
| AR | Amphibians and reptiles (including Lizards, Goannas, Snakes) | 5.4 | FSANZ |
| AR0990 | Frogs | 0.44 | USDA |
| AR0993 | Turtles | 0.73 | USDA |
| CF | Cereal grain fractions not listed below | 6.3 | FSANZ |
| CF0081 | Cereal brans, processed | 6.3 | FSANZ |
| CF0641 | Barley Flour | 3.4 | FSANZ |
| CF0645 | Maize meal | 4.0 | FSANZ |
| CF0654 | Wheat bran, processed | 6.3 | FSANZ |
| CF1210 | Wheat germ | 8.7 | FSANZ |
| CF1211 | Wheat flour | 1.2 | FSANZ |
| CF1212 | Wheat wholemeal | 2.3 | FSANZ |
| CF1250 | Rye flour | 2.6 | FSANZ |
| CF1251 | Rye wholemeal | 2.6 | FSANZ |
| CF1255 | Maize flour | 4.0 | FSANZ |
| CF1266 | Rice Flour | 16 | USDA |
| CF1641 | Buckwheat Flour | 2.0 | FSANZ |
| CM | Early milling products not listed below | 6.3 | FSANZ |
| CM0649 | Rice, husked | 10 | FSANZ |
| CM0654 | Wheat bran, unprocessed | 6.3 | FSANZ |
| CM1205 | Rice, polished | 16 | USDA |
| CM2000 | Psyllium husks | 3.7 | FSANZ |
| DF | Dried fruits not listed below | 0.12 | USDA |
| DF0013 | Cherries, dried | 1.8 | USDA |
| DF0014 | Prunes | 0.14 | USDA |
| DF0020 | Blueberries, dried | 4.0 | USDA |
| DF0021 | Currants, Black, Red, White, dried | 0.45 | USDA |
| DF0226 | Apples, dried | 0.12 | USDA |
| DF0230 | Pear, dried | 1.3 | USDA |
| DF0240 | Apricots, dried | 0.74 | FSANZ |
| DF0245 | Nectarine, dried | 2.7 | USDA |
| DF0247 | Peach, dried | 2.7 | USDA |
| DF0264 | Blackberries, dried | 4.0 | USDA |
| DF0265 | Cranberry, dried | 1.5 | FSANZ |
| DF0269 | Dried grapes (including Currants, dried, Sultanas, dried, Raisins, dried) | 0.12 | USDA |
| DF0272 | Raspberries, Red, Black, dried | 4.0 | USDA |
| DF0275 | Strawberry, dried | 4.0 | USDA |
| DF0295 | Dates, dried or dried and candied | 0.35 | USDA |
| DF0297 | Figs, dried or dried and candied | 1.0 | FSANZ |
| DF0327 | Banana, dried | 1.0 | USDA |
| DF0345 | Mango, dried | 1.0 | USDA |
| DF0351 | Papaya, dried | 1.0 | USDA |
| DF0353 | Pineapple, dried | 1.0 | USDA |
| DF0355 | Pomegranate, dried | 1.0 | USDA |
| DF0999 | Goji Berry, Dried | 2.6 | FSANZ |
| DH | Dried Herbs not listed below | 7.6 | USDA |
| DH0722 | Basil, dry | 11 | USDA |
| DH0723 | Bay leaves, dry | 15 | USDA |
| DH0736 | Marjoram, dry (Oregano, dry) | 9.4 | USDA |
| DH0738 | Mints, dry | 1.8 | USDA |
| DH0740 | Parsley, dried | 7.6 | USDA |
| DH0741 | Rosemary, dry | 27 | USDA |
| DH0743 | Sage, dry | 18 | USDA |
| DH0750 | Thyme, dry | 4.7 | USDA |
| DH0756 | Cilantro, leaves, dry | 22. | USDA |
| DM0305 | Olives, processed | 147 | FSANZ |
| DM0659 | Sugar cane molasses | 0 | USDA |
| DM0715 | Cocoa powder | 47 | FSANZ |
| DM1215 | Cocoa butter | 47 | FSANZ |
| DM1216 | Cocoa mass | 47 | FSANZ |
| DT | Teas (including Roselle (calyx and flowers), dry, Camomile (including scented mayweed), Lemon verbena (dry leaves), Lime blossoms, Mate (dry leaves), Tea Green, Black (black, fermented and dried), Dokudami, Forest berry herb, Lemon iron bark, Rooibos) | 7.6 | USDA |
| DV | Dried vegetables not listed below | 2.0 | USDA |
| DV0381 | Garlic, dried | 1.1 | USDA |
| DV0384 | Leek, dried | 0.29 | USDA |
| DV0385 | Onion, dried | 2.0 | USDA |
| DV0444 | Chilli, powder/dried | 31 | USDA |
| DV0445 | Peppers, sweet, dried (Paprika) | 16 | USDA |
| DV0448 | Tomato, dried | 4.8 | USDA |
| DV0450 | Mushrooms, dried | 1.5 | USDA |
| DV0577 | Carrot, dried | 0.57 | USDA |
| DV0589 | Potato, dried | 0.040 | USDA |
| FB | Berries and other small fruits not listed below | 0.42 | USDA |
| FB0020 | Blueberries | 0.47 | USDA |
| FB0021 | Currants, Black, Red, White | 0.56 | USDA |
| FB00212 | Currants, Black | 0.56 | USDA |
| FB00213 | Currants, Red, White | 0.28 | USDA |
| FB0264 | Blackberries | 0.44 | USDA |
| FB0265 | Cranberry | 0.18 | USDA |
| FB0266 | Dewberries (including Olallie berry, Youngberry) | 0.23 | USDA |
| FB02661 | Boysenberry | 0.23 | USDA |
| FB02662 | Loganberry | 0.28 | USDA |
| FB0267 | Elderberries | 0.80 | USDA |
| FB0268 | Gooseberry | 0.51 | USDA |
| FB0269 | Grapes (including Grapes, for wine) | 0.07 | USDA |
| FB0271 | Mulberries | 0.41 | USDA |
| FB0272 | Raspberries, Red, Black | 0.59 | USDA |
| FB0275 | Strawberry | 0.42 | USDA |
| FC | Citrus fruits not listed below | 0.20 | USDA |
| FC0003 | Mandarins | 0.53 | USDA |
| FC00032 | Clementine | 0.53 | USDA |
| FC00033 | Tangelo | 0.53 | USDA |
| FC00034 | Tangerine | 0.53 | USDA |
| FC00035 | Tangors | 0.53 | USDA |
| FC0004 | Oranges, Sweet, Sour (Bigarade, Chinotto, Chironja) | 0.20 | USDA |
| FC0203 | Grapefruit | 0.18 | USDA |
| FC0204 | Lemon | 0.10 | USDA |
| FC0205 | Lime | 0.16 | USDA |
| FC0210 | Australian blood lime | 4.5 | FSANZ |
| FC0211 | Australian desert lime | 4.5 | FSANZ |
| FC0212 | Australian round lime | 4.5 | FSANZ |
| FI | Tropical fruits with inedible peel not listed below | 0.22 | USDA |
| FI0326 | Avocado | 86 | FSANZ |
| FI0327 | Banana (includes banana dwarf) | 0.22 | USDA |
| FI0329 | Bread fruit | 0.32 | USDA |
| FI0331 | Cherimoya | 0.21 | USDA |
| FI0332 | Custard apple | 0.80 | FSANZ |
| FI0335 | Feijoa (Pineapple guava) | 0.56 | USDA |
| FI0336 | Guava | 0.82 | USDA |
| FI0338 | Jackfruit | 1.3 | USDA |
| FI0341 | Kiwifruit (Chinese gooseberry, Strawberry peach) | 0.47 | USDA |
| FI0343 | Litchi | 1.2 | USDA |
| FI0344 | Mammey apple | 2.1 | USDA |
| FI0345 | Mango | 0.75 | USDA |
| FI0350 | Papaya (Pawpaw, Papaw) | 0.34 | USDA |
| FI0351 | Passionfruit (Granddilla) | 0.86 | USDA |
| FI0353 | Pineapple | 0.12 | USDA |
| FI0354 | Plantain | 0.21 | USDA |
| FI0355 | Pomegranate | 0.77 | USDA |
| FI0356 | Prickly pear (Indian fig) | 0.72 | USDA |
| FI0359 | Sapodilla | 5.2 | USDA |
| FI0360 | Sapote, Black | 0.95 | USDA |
| FI0361 | Sapote, Green | 0.95 | USDA |
| FI0362 | Sapote, Mammey | 0.95 | USDA |
| FI0363 | Sapote, White | 0.95 | USDA |
| FI0365 | Soursop (Guanabana) | 0.85 | USDA |
| FI0368 | Sugar apple (Sweetsop) | 1.1 | USDA |
| FI0369 | Tamarind | 1.8 | USDA |
| FP | Pome fruits (including Medlar) | 0.070 | USDA |
| FP0226 | Apple | 0.070 | USDA |
| FP0227 | Crab-apple | 0.11 | USDA |
| FP0228 | Loquat (Japanese medlar) | 0.080 | USDA |
| FP0230 | Pear (including Nashi pear, Oriental pear, Sand pear) | 0.81 | USDA |
| FP0231 | Quince | 0.36 | USDA |
| FS | Stone fruits not listed below | 0.65 | USDA |
| FS0013 | Cherries (including Morello) | 0.47 | USDA |
| FS00131 | Cherry, Sour | 0.81 | USDA |
| FS00132 | Cherry, Sweet | 0.47 | USDA |
| FS0014 | Plums (including prunes) | 1.3 | USDA |
| FS0240 | Apricot | 1.7 | USDA |
| FS0245 | Nectarine | 0.86 | USDA |
| FS0247 | Peach | 0.65 | USDA |
| FS0249 | Sloe (American plum) | 1.3 | USDA |
| FS0250 | Japanese apricot | 1.7 | USDA |
| FT | Tropical fruits with edible peel not listed below | 0.66 | USDA |
| FT0287 | Barbados cherry (Acerola) | 0.81 | USDA |
| FT0289 | Carambola | 0.30 | USDA |
| FT0295 | Date | 0.35 | USDA |
| FT0297 | Fig | 0.66 | USDA |
| FT0303 | Kumquats (including Murami, Nagami) | 1.2 | FSANZ |
| FT0305 | Olives | 147 | FSANZ |
| FT0307 | Persimmon, Japanese (including Chinese & Kaki fruit) | 0.37 | USDA |
| GC | Cereal grains not listed below | 3.3 | FSANZ |
| GC0640 | Barley (including Barley, for beer) | 3.4 | FSANZ |
| GC0641 | Buckwheat | 2.0 | FSANZ |
| GC0645 | Maize (corn) | 4.0 | FSANZ |
| GC0646 | Millet | 9.0 | USDA |
| GC0647 | Oats | 41 | FSANZ |
| GC0649 | Rice | 10 | FSANZ |
| GC0650 | Rye | 2.6 | FSANZ |
| GC0651 | Sorghum (Chicken corn, Dari seed, Durra, Feterita) | 9.2 | USDA |
| GC0654 | Wheat (including Emmer, Spelt) | 3.3 | FSANZ |
| GC0656 | Popcorn | 4.0 | FSANZ |
| GS0658 | Sorgo or Sorghum, Sweet | 9.2 | USDA |
| HH | Herbs not listed below | 2.9 | USDA |
| HH0722 | Basil | 0.88 | USDA |
| HH0727 | Chives (including Chinese chives, Garlic chives) | 0.95 | USDA |
| HH0730 | Dill | 8.0 | USDA |
| HH0738 | Mints | 0.10 | FSANZ |
| HH0740 | Parsley | 2.9 | USDA |
| HH0741 | Rosemary | 10 | USDA |
| HH0750 | Thyme | 0.81 | USDA |
| HH0756 | Cilantro, leaves | 2.7 | USDA |
| HH0761 | Lemongrass | 0.42 | USDA |
| HS | Spices not listed below | 135 | USDA |
| HS0624 | Celery seed | 155 | USDA |
| HS0730 | Dill seed | 94 | USDA |
| HS0731 | Fennel, seed | 99 | USDA |
| HS0771 | Anise seed | 98 | USDA |
| HS0773 | Caper buds | 0.57 | USDA |
| HS0774 | Caraway seed | 70 | USDA |
| HS0775 | Cardamom seed | 8.5 | USDA |
| HS0777 | Cinnamon bark (including Cassia bark, Teypat) | 2.5 | USDA |
| HS0778 | Cloves, buds | 9.9 | USDA |
| HS0779 | Coriander, seed | 135 | USDA |
| HS0780 | Cumin seed | 136 | USDA |
| HS0784 | Ginger, root | 1.2 | USDA |
| HS0788 | Mace | 106 | USDA |
| HS0789 | Nutmeg | 16 | USDA |
| HS0790 | Pepper, Black; White | 6.5 | USDA |
| HS0792 | Pimento, fruit (Allspice fruit) | 6.6 | USDA |
| HS0794 | Turmeric, root | 1.3 | USDA |
| HS0795 | Vanilla, beans | 0.080 | USDA |
| HS0799 | Wattle seed | 15 | FSANZ |
| HS0808 | Saffron | 3.9 | USDA |
| IM | Molluscs not listed below | 2.1 | USDA |
| IM0107 | Octopus | 0.62 | USDA |
| IM1000 | Clams | 0.60 | USDA |
| IM1001 | Cockles | 0.60 | USDA |
| IM1002 | Cuttlefish | 0.31 | USDA |
| IM1003 | Mussels | 2.1 | USDA |
| IM1004 | Oysters | 1.0 | FSANZ |
| IM1005 | Scallops | 0.20 | FSANZ |
| IM1007 | Snails, Edible | 2.1 | USDA |
| IM1008 | Squids | 0.20 | FSANZ |
| IM1011 | Abalone (Paua) | 0.80 | FSANZ |
| IM1012 | Pipis | 0.60 | USDA |
| MF | Fat, mammalian not listed below | 243 | FSANZ |
| MF0812 | Cattle fat | 243 | FSANZ |
| MF0814 | Goat fat | 141 | FSANZ |
| MF0818 | Pig fat | 307 | FSANZ |
| MF0822 | Sheep fat | 196 | FSANZ |
| ML | Mammalian milks not listed below | 7.9 | FSANZ |
| ML0812 | Full fat cattle milk | 7.9 | FSANZ |
| ML08125 | Cattle milk, low fat | 0 | FSANZ |
| ML08126 | Cattle milk, reduced fat | 2.7 | FSANZ |
| MM | Mammalian meats not listed below | 30 | FSANZ |
| MM0014 | Possum meat | 1.9 | FSANZ |
| MM0017 | Wallaby meat | 1.9 | FSANZ |
| MM0810 | Buffalo meat | 8.0 | FSANZ |
| MM0811 | Camel meat (including Llama) | 22 | FSANZ |
| MM0812 | Cattle meat (including Veal, Yak meat, Zebu meat) | 30 | FSANZ |
| MM0813 | Deer meat | 6.3 | USDA |
| MM0814 | Goat meat | 18 | FSANZ |
| MM0815 | Hare meat | 5.3 | FSANZ |
| MM0816 | Horse meat | 13 | USDA |
| MM0817 | Kangaroo meat | 2.3 | FSANZ |
| MM0818 | Pig meat | 21 | FSANZ |
| MM0819 | Rabbit meat | 5.3 | FSANZ |
| MM0820 | Reindeer meat | 9.3 | USDA |
| MM0822 | Sheep meat (including Lamb, Mutton) | 38 | FSANZ |
| MM0823 | Wild boar, meat | 11 | USDA |
| MM0824 | Elk meat (including European moose meat) | 1.4 | USDA |
| MM0830 | Echidna Meat | 1.9 | FSANZ |
| MO | Mammalian offal not listed below | 60 | USDA |
| MO00261 | Deer kidney | 3.0 | USDA |
| MO00262 | Deer liver | 4.1 | USDA |
| MO0098 | Kidney of cattle, goats, pigs and sheep | 3.0 | USDA |
| MO0812 | Cattle, edible offal of | 60 | USDA |
| MO08121 | Cattle, kidney | 3.0 | USDA |
| MO08122 | Cattle, liver | 4.1 | USDA |
| MO08161 | Horse, kidney | 30 | USDA |
| MO08162 | Horse, liver | 4.1 | USDA |
| MO0818 | Pig, edible offal of | 9.0 | USDA |
| MO08181 | Pig, kidney | 9.7 | USDA |
| MO08182 | Pig, liver | 4.6 | USDA |
| MO08183 | Pig, skin | 64 | USDA |
| MO0822 | Sheep, edible offal of | 61 | USDA |
| MO08221 | Sheep, kidney | 3.6 | USDA |
| MO08222 | Sheep, liver | 7.4 | USDA |
| OC | Crude vegetable oils not listed below  *Baseline (unspecified oils are vegetable oil)* scenario  *100% SHO safflower oil* scenario  *Baseline (unspecified oils are safflower oil)* scenario  *100% SHO safflower oil plus 100% SHO unspecified oils* scenario | 415  415  759  921∇ | FSANZ  FSANZ  Applicant  Applicant |
| OC0305 | Olive oil, crude | 688 | FSANZ |
| OC0495 | Rape seed oil, crude | 580 | FSANZ |
| OC0541 | Soya bean oil, crude | 220 | FSANZ |
| OC0645 | Maize oil, crude | 273 | USDA |
| OC0665 | Coconut oil, crude | 63 | USDA |
| OC0691 | Cotton seed oil, crude | 9.6 | USDA |
| OC0696 | Palm oil, crude | 197 | USDA |
| OC0697 | Peanut oil, crude | 487 | FSANZ |
| OC0699 | Safflower seed oil, crude  *Baseline (unspecified oils are vegetable oil)* scenario  *100% SHO safflower oil* scenario  *Baseline (unspecified oils are safflower oil)* scenario  *100% SHO safflower oil plus 100% SHO unspecified oils* scenario | 759  921∇  759  921 | Applicant  Applicant  Applicant  Applicant |
| OC0700 | Sesame seed oil, crude | 393 | USDA |
| OC0702 | Sunflower oil, crude | 275 | FSANZ |
| OC1240 | Palm kernel oil, crude | 197 | USDA |
| OR | Unspecified vegetable oil  *Baseline (unspecified oils are vegetable oil)* scenario  *100% SHO safflower oil* scenario  *Baseline (unspecified oils are safflower oil)* scenario  *100% SHO safflower oil plus 100% SHO unspecified oils* scenario | 415  415  759  921∇ | FSANZ  FSANZ  Applicant  Applicant |
| OR0001 | Linola oil, edible | 183 | USDA |
| OR0002 | Linseed oil, crude | 183 | USDA |
| OR0269 | Grapeseed Oil | 198 | FSANZ |
| OR0305 | Olive oil, refined | 688 | FSANZ |
| OR0326 | Avocado Oil | 679 | USDA |
| OR0485 | Mustard Seed Oil | 116 | USDA |
| OR0495 | Rape seed oil, edible | 580 | FSANZ |
| OR0539 | Rice Bran Oil | 389 | FSANZ |
| OR0541 | Soya bean oil, refined | 220 | FSANZ |
| OR0645 | Maize oil, edible | 273 | USDA |
| OR0660 | Almond Oil | 647 | FSANZ |
| OR0665 | Coconut oil, refined | 63 | USDA |
| OR0669 | Macadamia nut Oil | 622 | FSANZ |
| OR0691 | Cotton seed oil, edible | 9.6 | USDA |
| OR0696 | Palm oil, edible | 197 | USDA |
| OR0697 | Peanut oil, edible | 487 | FSANZ |
| OR0699 | Safflower seed oil, edible  *Baseline (unspecified oils are vegetable oil)* scenario  *100% SHO safflower oil* scenario  *Baseline (unspecified oils are safflower oil)* scenario  *100% SHO safflower oil plus 100% SHO unspecified oils* scenario | 759  921  759  921∇ | Applicant  Applicant  Applicant  Applicant |
| OR0700 | Sesame seed oil, edible | 393 | USDA |
| OR0702 | Sunflower seed oil, edible | 275 | FSANZ |
| OR1240 | Palm kernel oil, edible | 197 | USDA |
| PE | Poultry eggs, excluding chicken eggs | 33 | FSANZ |
| PE0840 | Chicken eggs | 33 | FSANZ |
| PF | Poultry fat, excluding chicken fat | 275 | FSANZ |
| PF0840 | Chicken fat | 275 | FSANZ |
| PF0841 | Duck fat | 287 | FSANZ |
| PM | Poultry meats not listed below | 21 | FSANZ |
| PM0840 | Chicken meat | 21 | FSANZ |
| PM0841 | Duck meat | 178 | FSANZ |
| PM0842 | Goose meat | 167 | USDA |
| PM0843 | Guinea-fowl meat | 20 | USDA |
| PM0844 | Partridge meat | 63 | USDA |
| PM0845 | Pheasant meat | 31 | USDA |
| PM0846 | Pigeon meat | 112 | FSANZ |
| PM0847 | Quail meat | 39 | FSANZ |
| PM0848 | Turkey meat | 17 | FSANZ |
| PM0850 | Emu meat | 6.4 | FSANZ |
| PM0851 | Ostrich meat | 4.0 | FSANZ |
| PM2003 | Mutton-bird meat | 31 | USDA |
| PO | Poultry offal not listed below | 11 | USDA |
| PO0113 | Poultry skin | 153 | FSANZ |
| PO0840 | Edible offal of chicken not listed below | 11 | USDA |
| PO08401 | Chicken liver only | 11 | USDA |
| PO08403 | Chicken skin | 153 | FSANZ |
| PO0841 | Edible offal of duck | 6.5 | USDA |
| PO08411 | Duck skin | 287 | FSANZ |
| PO08421 | Goose, liver | 7.4 | USDA |
| PO08471 | Quail skin | 153 | FSANZ |
| PO0848 | Edible offal of turkey | 9.2 | USDA |
| PO08481 | Turkey skin | 122 | USDA |
| SB | Seed for beverages and sweets not listed below | 0.30 | FSANZ |
| SB0716 | Coffee beans | 0.30 | FSANZ |
| SO | Oilseeds not listed below | 60 | FSANZ |
| SO0479 | Mustard seed, Indian | 97 | FSANZ |
| SO0485 | Mustard seed | 97 | FSANZ |
| SO0691 | Cotton seed | 66 | USDA |
| SO0693 | Linseed (Flax-seed) | 74 | USDA |
| SO0694 | Mustard seed, Field (Indian colza, Indian rape seed) | 97 | FSANZ |
| SO0697 | Peanut (Groundnut) | 317 | FSANZ |
| SO0698 | Poppy seed | 60 | FSANZ |
| SO0699 | Safflower seed | 48 | USDA |
| SO0700 | Sesame seed | 222 | FSANZ |
| SO0702 | Sunflower seed | 97 | FSANZ |
| SO0703 | Peanut, whole | 238 | USDA |
| SO0711 | Pumpkin seed | 161 | USDA |
| SO0900 | Lotus seed | 2.3 | USDA |
| SO2004 | Chia seed | 22 | USDA |
| TN | Tree nuts not listed below | 305 | FSANZ |
| TN0295 | Cashew nut | 310 | FSANZ |
| TN0660 | Almonds | 305 | FSANZ |
| TN0661 | Brazil nut | 217 | FSANZ |
| TN0664 | Chestnuts (Chinquapin) | 4.1 | USDA |
| TN0665 | Coconut | 16 | FSANZ |
| TN0666 | Hazelnuts (Filberts) | 486 | FSANZ |
| TN0667 | Hickory nuts | 320 | USDA |
| TN0668 | Japanese horse-chestnut | 2.7 | USDA |
| TN0669 | Macadamia nuts (Bush nut, Queensland nut) | 461 | FSANZ |
| TN0672 | Pecan | 392 | FSANZ |
| TN0673 | Pine nuts (Pignolia or Pignoli, Pinocchi, Pinon nut) | 222 | FSANZ |
| TN0675 | Pistachio nuts | 262 | FSANZ |
| TN0678 | Walnuts | 120 | FSANZ |
| VA | Bulb vegetables not listed below | 0.13 | USDA |
| VA0380 | Fennel, bulb (including Carosella) | 0.65 | USDA |
| VA0381 | Garlic | 2.0 | FSANZ |
| VA0384 | Leek | 0.040 | USDA |
| VA0385 | Onion, bulb | 0.13 | USDA |
| VA0388 | Shallot | 0.14 | USDA |
| VB | Brassica vegetables no listed below | 0.10 | USDA |
| VB0041 | Cabbages, head | 0.13 | USDA |
| VB00421 | Broccoli | 0.10 | USDA |
| VB00423 | Cauliflower | 0.27 | USDA |
| VB0402 | Brussels sprouts | 0.19 | USDA |
| VB0405 | Kohlrabi | 0.070 | USDA |
| VC | Cucurbits not listed below | 0.050 | USDA |
| VC0046 | Melons, except Watermelon | 0.030 | USDA |
| VC0423 | Chayote (Christophine) | 0.090 | USDA |
| VC0424 | Cucumber | 0.050 | USDA |
| VC0429 | Pumpkins (including Cushaws, Vegetable spaghetti) | 0.10 | FSANZ |
| VC0431 | Squash, summer (including Marrow, Zucchetti, Zucchini) | 0.14 | USDA |
| VC0432 | Watermelon | 0.37 | USDA |
| VC0433 | Squash, winter | 0.10 | USDA |
| VD | Pulses not listed below | 2.3 | USDA |
| VD0523 | Broad bean (dry) [Fava bean, Horse bean] | 3.0 | USDA |
| VD0524 | Chick-pea (dry) [Gram] | 15 | USDA |
| VD0526 | Common bean (dry) [Dwarf bean, Field bean, Flagelot] | 2.3 | USDA |
| VD05261 | Haricot bean (dry) [Navy bean (dry)] | 1.5 | FSANZ |
| VD05262 | Kidney bean (dry) | 1.4 | FSANZ |
| VD0527 | Cowpea (dry) [Black-eyed pea] | 0.88 | USDA |
| VD0531 | Hyacinth bean (dry) [Bonavist bean, Lablab (dry)] | 0.76 | USDA |
| VD0533 | Lentil (dry) | 4.9 | USDA |
| VD0534 | Lima bean (dry) [Butter bean, Sieva bean] | 1.3 | FSANZ |
| VD0536 | Mung bean (dry) [Green gram (dry)] | 1.6 | USDA |
| VD0537 | Pigeon pea (dry) [Angola pea, Cajan pea, Red gram] | 0.12 | USDA |
| VD0541 | Soya bean (dry) (including Soya bean (dry), used for tofu, Soya bean (dry), used for soy sauce, Soy Flour) | 43 | USDA |
| VD0545 | Lupin (dry) | 18 | FSANZ |
| VD0560 | Adzuki bean (dry) | 0.50 | USDA |
| VD0561 | Field pea (dry) [Wrinkled pea (dry)] | 3.9 | USDA |
| VL | Leafy vegetables not listed below | 0.050 | USDA |
| VL0269 | Grape leaves | 0.39 | USDA |
| VL0460 | Amaranth (Bledo) | 0.76 | USDA |
| VL0464 | Chard (silver beet) | 0.40 | USDA |
| VL0466 | Pak-choi or Paksoi (Celery mustard, Pak-tsoi) | 0.15 | USDA |
| VL0467 | Chinese cabbage (Pe-tsai, Celery cabbage, Pak-tsai) | 0.21 | USDA |
| VL0469 | Chicory leaves (Sugar loaf) | 0.060 | USDA |
| VL0472 | Cress, garden | 0.87 | USDA |
| VL0473 | Watercress | 0.060 | USDA |
| VL0474 | Dandelion | 0.14 | USDA |
| VL0476 | Endive | 0.040 | USDA |
| VL0480 | Kale (Borecole, Collard) | 0.29 | USDA |
| VL0481 | Komatsuma (Mustard spinach) | 0.22 | USDA |
| VL0482 | Lettuce, Head | 0.040 | USDA |
| VL0483 | Lettuce, Leaf | 0.050 | USDA |
| VL0485 | Mustard greens (Mizuna) | 0.15 | USDA |
| VL0486 | New Zealand spinach (Warrigal greens) | 0.030 | USDA |
| VL0496 | Rucola (Arugula, Rocket salad, Roquette) | 0.46 | USDA |
| VL0502 | Spinach | 0.050 | USDA |
| VL0505 | Taro leaves | 0.60 | USDA |
| VL0506 | Turnip greens (Broccoli raab, Namenia) | 0.090 | USDA |
| VL0508 | Sweet potato, leaves | 0.20 | USDA |
| VL0510 | Cos lettuce | 0.090 | USDA |
| VO | Other fruiting vegetables not listed below | 0.30 | USDA |
| VO0440 | Eggplant (Aubergine, Thai eggplant, Pea eggplant) | 0.14 | USDA |
| VO0442 | Okra (Lady's finger) | 0.16 | USDA |
| VO0444 | Peppers, chili (Cluster pepper, Cone pepper) | 0.24 | USDA |
| VO0445 | Peppers, sweet (Bell pepper, Paprika, Pimento) | 0.020 | USDA |
| VO0447 | Sweet corn | 0.20 | FSANZ |
| VO0448 | Tomato | 0.30 | USDA |
| VO0449 | Yeast only | 0.22 | USDA |
| VO0450 | Mushrooms | 0.10 | FSANZ |
| VP | Legume vegetables not listed below | 0.080 | USDA |
| VP0522 | Broad bean (green pods and immature seeds) | 0.17 | USDA |
| VP0523 | Broad bean, shelled (succulent) [Fava bean] | 0.17 | USDA |
| VP0526 | Common bean (pods and/or immature seeds) (including (Snap bean (immature seeds))) | 0.080 | USDA |
| VP05261 | Haricot bean (green pods and/or immature seeds) | 0.52 | USDA |
| VP05263 | Kidney bean (green pods and/or immature seeds) | 0.39 | USDA |
| VP0527 | Cowpea (immature pods) | 0.19 | USDA |
| VP0528 | Garden pea (young pods)(=succulent, immature seeds) | 0.21 | USDA |
| VP0529 | Garden pea, shelled (succulent seeds)[Wrinkled pea] | 0.35 | USDA |
| VP0530 | Goa bean (immature pods)[Asparagus pea, Winged bean] | 2.5 | USDA |
| VP0531 | Hyacinth bean (young pods, immature seeds)[Lablab] | 0.95 | USDA |
| VP0533 | Lentil (young pods) | 1.0 | USDA |
| VP0534 | Lima bean (young pods and/or immature beans) | 0.50 | USDA |
| VP0536 | Mung bean (green pods) [Green gram] | 0.22 | USDA |
| VP0537 | Pigeon pea (green pods and/or young seeds) | 0.13 | USDA |
| VP0538 | Podded pea (young pods)[Mangetout, Sugar pea] | 0.21 | USDA |
| VP0541 | Soya bean (immature seeds) | 13 | USDA |
| VP0544 | Yard-long bean (pods) [Asparagus bean] | 0.21 | USDA |
| VR | Root and tuber vegetables not listed below | 0.12 | USDA |
| VR0463 | Cassava (Manioc, Tapioca) | 0.75 | USDA |
| VR0469 | Chicory, roots | 0.040 | USDA |
| VR0494 | Radish | 0.17 | USDA |
| VR0497 | Swede (Rutabaga, Swedish turnip) | 0.25 | USDA |
| VR0505 | Taro (Cocoyam, Dasheen, Eddoe) | 0.16 | USDA |
| VR0506 | Turnip, garden | 0.060 | USDA |
| VR0508 | Sweet potato | 0.010 | USDA |
| VR0573 | Arrowroot | 0.040 | USDA |
| VR0574 | Beetroot | 0.32 | USDA |
| VR0575 | Burdock, greater or edible | 0.37 | USDA |
| VR0577 | Carrot | 0.12 | USDA |
| VR0578 | Celeriac | 0.56 | USDA |
| VR0583 | Horseradish | 1.3 | USDA |
| VR0585 | Jerusalem artichoke | 0.040 | USDA |
| VR0588 | Parsnip | 1.0 | USDA |
| VR0589 | Potato | 0.010 | USDA |
| VR0600 | Yams | 0.060 | USDA |
| VR0601 | Yam bean (Jicama, Potato yam) | 0.050 | USDA |
| VR0603 | Chinese water chestnut | 5.6 | USDA |
| VR0606 | Lotus root | 0.14 | USDA |
| VR0607 | Wasabi | 43 | USDA |
| VS | Stalk and stem vegetables not listed below | 0.31 | USDA |
| VS0469 | Witloof chicory (sprouts) | 0.020 | USDA |
| VS0620 | Artichoke, globe | 0.050 | USDA |
| VS0621 | Asparagus | 0 | USDA |
| VS0622 | Bamboo shoots | 0.070 | USDA |
| VS0623 | Cardoon | 0.18 | USDA |
| VS0624 | Celery | 0.31 | USDA |
| VS0627 | Rhubarb | 0.37 | USDA |
| WC | Crustaceans of all species not listed below | 0.60 | FSANZ |
| WC0146 | Crabs | 1.0 | USDA |
| WC0978 | Lobsters (Langouste) | 0.80 | FSANZ |
| WC0979 | Shrimps or Prawns | 0.60 | FSANZ |
| WD | Diadromous fish (including Paddle fish, Shad, Smelt, Whitebait) | 54 | FSANZ |
| WD0121 | Salmon species | 54 | FSANZ |
| WD0123 | Trout species (including Arctic char) | 75 | FSANZ |
| WD0890 | Eel species | 28 | USDA |
| WD0891 | Milkfish | 26 | FSANZ |
| WD0893 | Salmon, Atlantic | 54 | FSANZ |
| WD0896 | Sturgeon | 14 | USDA |
| WD0897 | Nile perch | 4.3 | FSANZ |
| WD0898 | Barramundi (including Giant sea perch) | 11 | FSANZ |
| WF | Freshwater fish not listed below | 9.0 | FSANZ |
| WF0858 | Bream | 9.0 | FSANZ |
| WF0859 | Carp | 12 | USDA |
| WF0861 | Catfish (freshwater) | 23 | USDA |
| WF0864 | Perch | 51 | FSANZ |
| WF0865 | Pike | 0.79 | USDA |
| WF0868 | Tilapia | 13 | FSANZ |
| WR | Roe (including Fish offal, Shark liver, Cod liver) | 11 | USDA |
| WR0140 | Fish Roe | 11 | USDA |
| WS | Marine fish of all species not listed below | 13 | USDA |
| WS0004 | Gemfish | 6.2 | FSANZ |
| WS0005 | Billfish (including marlin, broadbill) | 22 | USDA |
| WS0006 | Orange roughy | 1.5 | USDA |
| WS0008 | Flathead | 1.1 | FSANZ |
| WS0010 | Snapper | 2.2 | FSANZ |
| WS0130 | Sardine and sardine-like fishes | 2.4 | FSANZ |
| WS0131 | Shark | 0.40 | FSANZ |
| WS0920 | Anchovies | 6.2 | USDA |
| WS0925 | Butterfish | 13 | FSANZ |
| WS0927 | Cod | 1.5 | FSANZ |
| WS0928 | Conger or Conger eel | 28 | USDA |
| WS0931 | Drums | 3.2 | FSANZ |
| WS0932 | Flounders | 3.6 | USDA |
| WS0934 | Haddock | 0.39 | USDA |
| WS0936 | Halibut | 2. | USDA |
| WS0937 | Herring | 29 | USDA |
| WS0938 | Jack mackerel (Indian mackerel, Scad) | 13 | USDA |
| WS0939 | King mackerel (Seerfish, Spanish mackerel) | 3.1 | USDA |
| WS0941 | Mackerel (including Atlantic, Chub, Indian, Short) | 23 | USDA |
| WS0943 | Mullet | 13 | FSANZ |
| WS0944 | Ocean Perch (Scorpion fishes) | 1.9 | USDA |
| WS0946 | Pollack (Coalfish) | 0.56 | USDA |
| WS0949 | Sea bass | 4.5 | USDA |
| WS0950 | Sea bream | 9.0 | FSANZ |
| WS0951 | Sole | 3.6 | USDA |
| WS0952 | Tuna (including Tuna, canned) | 9.2 | USDA |
| WS09521 | Tuna, non-canned, non-bluefin | 1.1 | FSANZ |
| WS0954 | Whiting | 0.60 | FSANZ |
| WS0955 | Wolffish (Sea Catfish) | 5.2 | USDA |
| WS0958 | Kingfish | 33 | FSANZ |
| XX0001 | Seaweed | 0.86 | USDA |
| XX0002 | Stevia | 0 | USDA |
| XX0003 | Agave | 0 | USDA |

\* All oleic concentrations shown in this table have been rounded to either 2 significant figures or to the nearest whole number (for concentrations >10 grams per kg)

∇ Mean oleic acid concentration of the two SHO Events

# Appendix 2: Dietary Intake Assessments at FSANZ

A dietary intake assessment is the process of estimating how much of a food chemical a population, or population sub group, consumes. Dietary intake of food chemicals is estimated by combining food consumption data with food chemical concentration data. The process of doing this is called ‘dietary modelling’.

*Dietary intake = food chemical concentration x food consumption*

FSANZ’s approach to dietary modelling is based on internationally accepted procedures for estimating dietary intake of food chemicals. Different dietary modelling approaches may be used depending on the assessment, the type of food chemical, the data available and the risk assessment questions to be answered. In the majority of assessments, FSANZ uses the food consumption data from each person in the national nutrition surveys to estimate their individual dietary intake. Population summary statistics such as the mean intake or a high percentile intake are derived from the ranked individual person’s intakes from the nutrition survey.

An overview of how dietary intake assessments are conducted and their place in the FSANZ Risk Analysis Process is provided on the FSANZ website at:

<http://www.foodstandards.gov.au/science/riskanalysis/Pages/default.aspx>

FSANZ has developed a custom-built computer program ‘Harvest’ to calculate dietary intakes. Harvest replaces the program ‘DIAMOND’ that has been used by FSANZ for many years. Harvest has been designed to replicate the calculations that occurred within DIAMOND using a different software package.

Further detailed information on conducting dietary intake assessments at FSANZ is provided in *Principles and Practices of Dietary Exposure Assessment for Food Regulatory Purposes* (FSANZ 2009), available at: <http://www.foodstandards.gov.au/science/exposure/documents/Principles%20_%20practices%20exposure%20assessment%202009.pdf>

## Food consumption data used

The most recent food consumption data available were used to estimate intakes of oleic acid for the Australian and New Zealand populations. The national nutrition survey (NNS) data used for these assessments were:

* The 2011-12 Australian National Nutrition and Physical Activity Survey (2011-12 NNPAS)
* The 2002 New Zealand National Children’s Nutrition Survey (2002 NZ CNS)
* The 2008-09 New Zealand Adult Nutrition Survey (2008 NZ ANS).

The design of each of these surveys varies somewhat and key attributes of each are set out below. Further information on the National Nutrition Surveys used to conduct dietary intake assessments is available on the FSANZ website at: <http://www.foodstandards.gov.au/science/exposure/Pages/dietaryexposureandin4438.aspx>

2011–12 Australian National Nutrition and Physical Activity Survey (2011-12 NNPAS)

The 2011–12 Australian National Nutrition and Physical Activity Survey (NNPAS) undertaken by the Australian Bureau of Statistics is the most recent food consumption data for Australia. This survey includes dietary patterns of a sample of 12,153 Australians aged 2 years and above. The survey used a 24-hour recall method for all respondents, with 64% of respondents also completing a second 24-hour recall on a second, non-consecutive day. The collection dates of the data were May 2011 to June 2012 (with no enumeration between August and September 2011 due to the Census). Only those respondents who had two days of food consumption data were used to estimate oleic acid intakes. Consumption and respondent data from the *Confidentialised Unit Record File*s (CURF) data set (ABS, 2015) form part of the Harvest core data set. These data were used weighted in Harvest.

2002 New Zealand National Children’s Nutrition Survey (2002 NZ CNS)

The 2002 NZ CNS was a cross-sectional and nationally representative survey of 3,275 New Zealand children aged 5-14 years. The collection period for the data was during the school year from February to December 2002. The survey used a 24-hour food recall and provided information on food and nutrient intakes, eating patterns, frequently eaten foods, physical activity patterns, dental health, anthropometric measures and nutrition-related clinical measures. It was also the first children’s nutrition survey in New Zealand to include a second day diet recall data for about 15% of the respondents, and dietary intake from both foods (including beverages) and dietary supplements. Only the Day 1 24-hour recall data for all respondents (excluding supplements) were used for this assessment. These data are used weighted in Harvest.

2008-09 New Zealand Adult Nutrition Survey (2008 NZ ANS)

The 2008 NZ ANS provides comprehensive information on the dietary patterns of a sample of 4,721 respondents aged 15 years and above. Collection of Data for the survey occurred on a stratified sample over a 12-month period between October 2008‑October 2009. The survey used a 24-hour recall methodology with 25% of respondents also completing a second 24-hour recall. The information collected in the 2008 NZ ANS included food and nutrient intakes, dietary supplement use, socio-demographics, nutrition related health, and anthropometric measures. Only the Day 1 24-hour recall data for all respondents (excluding supplements) were used for this assessment. These data are used weighted in Harvest.

Limitations of dietary intake assessments

Dietary intake assessments based on food consumption data from national dietary surveys provide the best estimation of actual consumption of a food and the resulting estimated dietary intake assessment for the Australian population aged 2 years and above, as well as the New Zealand populations aged 5-14 years and 15 years and above. However, it should be noted that national nutrition survey data do have limitations. Further details of the limitations relating to dietary intake assessments undertaken by FSANZ are set out in the FSANZ document, *Principles and Practices of Dietary Exposure Assessment for Food Regulatory Purposes* (FSANZ, 2009).

1. Harvest is FSANZ’s custom-built platform to calculate dietary exposures. [↑](#footnote-ref-2)