USDA Database for the Proanthocyanidin Content of Selected Foods

Release 2.1

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Release History

Release 1, August 2004
Release 2, September 2015.

- Added 79 food items.
- Removed monomers, as they are included in the USDA Database for the Flavonoid Content of Selected Foods, Release 3.1

December 2015 revision

- Removed “Kiwi, gold, raw” (NDB No. 09445) as the specific cultivar analyzed is no longer on the market.
- Changed NDB No. for “Tea, green, brewed” from 14072 to 14278 to match that used in SR28.

Release 2.1, March 2018

- Added new data for cranberries and cranberry products

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Documentation

Proanthocyanidins (PAs), also referred to as 'Condensed Tannins', are oligomers and polymers of flavan-3-ols. PAs include procyanidins, propelargonidins, and prodelphidins. Procyanidins are the most common. PAs are known for contributing astringent flavor to foods. Recently several studies have revealed health benefits associated with PA intakes alone or with other flavonoids. A meta-analysis of 14 prospective cohort studies suggested reduction in the risk for cardiovascular diseases by various flavonoids classes, including a relative risk (RR) of 0.90, 95% CI 0.82, 0.98 for PAs (Wang et al., 2014). A reduction in the risks of colorectal, especially rectal cancer (Rossi et al., 2010), and pancreatic cancer were observed in the Northern Italian population (Rossi et al., 2012). PAs found in cranberry juice with A-type linkages prevented adhesion of uropathogenic P-fimbriated *E. coli* suggesting they may help to maintain a healthy urinary tract (Howell et al., 2005).

Changes in the update of the proanthocyanidins database

USDA scientists at the Nutrient Data Laboratory (NDL), ARS, released a Special Interest Database for PAs, "USDA Database for Proanthocyanidin Contents in Selected Foods" in 2004. New analytical data on proanthocyanidins have been published since the first release and retrieved by the NDL scientists. These data were aggregated with the existing data to update the database. The structure of the database is slightly modified. The key change is monomeric flavan-3-ols are not included in this version because they are not PAs by definition. The USDA's Database for Flavonoid Content of Selected Foods, Release 3.1, (2013) does contain values for monomeric flavan-3-ols, catechin and epicatechin, and their gallate esters. The 2004 release of the PA database had a separate table for all the foods in which PAs were not detected. These foods are now included in the main table with assigned "zero" values. All the foods are now organized by the same food groups as in the National Nutrient Database for the Standard Reference (SR) released yearly (USDA-ARS, 2014) by NDL, though not all food groups included in SR are contained in the PA database. Foods are listed in an alphabetical order within the Food Group.

Data Sources

Published data were collected through searches of scientific literature databases. Only data from studies that used acceptable analytical methods (High Performance Liquid Chromatography (HPLC) methods, both normal and reverse phase) were considered for inclusion. Thirty-seven new studies were included making a total of 67 studies from which the data were accepted in the update. The reverse phase HPLC method is not suitable for separating the compounds with degrees of polymerization (DPs) higher than three (Adamson, et al 1999). Since a number of studies, using the reverse phase HPLC method, are included in the database, compounds with DPs >3 may not be reported for all foods. Analytical methods like Folin-Ciocalteu and Vanillin assay which are not specific for PAs only and quantify only total PAs, but not individual compounds, were not considered acceptable. The normal-phase HPLC method developed by Hammerstone, et al (1999) and optimized by Adamson, et al (1999) and Gu, et al (2002,

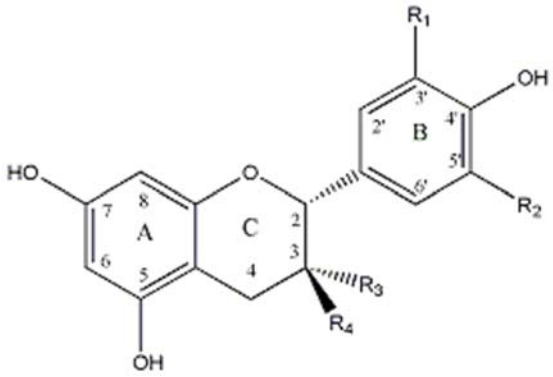
2003) separates and quantifies all compounds from mono- to decamers individually and polymers with DPs greater than ten as a single peak. Gu, et al (2002) validated this method to demonstrate the efficiency of extraction and specificity of separation and quantification. The risk of contamination of polymers with non-proanthocyanidin (non-PA) compounds is minimal due to the limited occurrence of these compounds in most foods. Non-PA compounds may occur in wines and strawberries. Reference standards for PA polymers are also not available to many analysts and standard curves using catechin/epicatechin monomers are used for quantifying. New analytical methods are being developed to determine Relative Response Factors (RRF) when catechin/epicatechin is used as the standard for quantifying (Lin et al., 2014).

Recently Pérez-Jiménez et al., (2009) and Hellström and Mattila (2008) have indicated that the PA contents reported in the literature by the aqueous-organic extracts of food samples may be underestimated because of the unextractable PAs remaining in the residues. The underestimation of total PAs varied widely from 4% in Valkeakuuals apples to 63% in a green variety of table grapes (Hellström and Mattilla 2008). Khanal et al., (2009) also suggested that extending the extraction time to 16 hours increased the total procyanidin contents by 24-200% in grape seeds and by 0-30% in berries. Unfortunately, literature data on individual unextractable PAs are very limited to warrant inclusion in the database at the present time. The compilation of databases is an ongoing dynamic process and future updates may include unextractable PAs also, thus improving the estimation of PAs in foods.

Data Management

PAs are polymers of flavan-3-ols or flavanols. Procyanidins (polymers of (epi)catechin) are the most common PAs in foods, however prodelphinidins (derived from (epi)gallocatechin) and propelargonidins (derived from (epi)afzelechin) also have been identified (Santos-Buelga and Scalbert 2000; Gu, et al 2004). See Figure 1.

The most common flavanol-flavanol linkages are C-C bonds (B-type, 4→6 or 4→8), but occasionally mixed double linkages occur (A-type, 4→8, 2→7). See Figure 2.



Proanthocyanid Subclass	Flavan-3-ol monomer	Substitution pattern			
		R_1	R_2	R_3	R_4
Procyanidin	Catechin	OH	H	H	OH
	Epicatechin	OH	H	OH	H
Prodelphinidin	Gallocatechin	OH	OH	H	OH
	Epigallocatechin	OH	OH	OH	H
Propelargonidin	Afzelechin	H	H	H	OH
	Epiafzelchin	H	H	OH	H

Figure 1. Structure of common flavan-3-ols and substitution patterns found in proanthocyanidins extracted from foods.

In Table 1, the main data table, dimers and trimers are reported individually, while tetramers, pentamers and hexamers are grouped together as 4-6mers; and heptamers, octamers, nonamers and decamers are grouped together as 7-10mers. Polymers (DP>10) are reported as a separate group. All the values are reported as mg/100g of fresh weight of edible portion. If a value was reported as "trace" an estimate was calculated by multiplying the limit of quantitation (LOQ) by a factor of 0.71 (Mangels, *et al,* 1993) to reflect the area under the curve below the LOQ, if the LOQ was available. If LOD or LOQ was not available a "zero" value was assigned to the trace value for computational purposes. Therefore a zero value reported in the database could be below LOD or between LOD and LOQ indicating that authors attempted to measure the compound in that food and did not observe a detectable signal or a trace value that could not be calculated. The lack of values for particular compounds does not imply that they were not present, but only that data were unavailable. The table of analytical values contains values for only those compounds and foods that were available at the time of this survey; it does not mean that other compounds were not present in that particular food or that foods not included in the database do not contain PAs. Occasionally, minimum and maximum values are not reported even though the number of samples was ≥2 because data came from a single source with only the mean value.

Unfortunately analytical technology was not advanced to the stage where each of these PAs as well as A type linkages could be quantified separately at the time of the first release of the USDA's PA database. Nonetheless, mass spectrometric detection systems, which have been employed for much of the current PA data, could qualitatively distinguish among the oligomers of varying polymerization degree and the various intermonomeric linkages (Figure 2). Therefore, the data in this table are a summation of all forms (different linkages and gallate esters) of PAs for a given oligomeric fraction. A separate table (Table 2) of foods that contained PAs other than procyanidins and foods that contained A type linkages is provided along with the references.

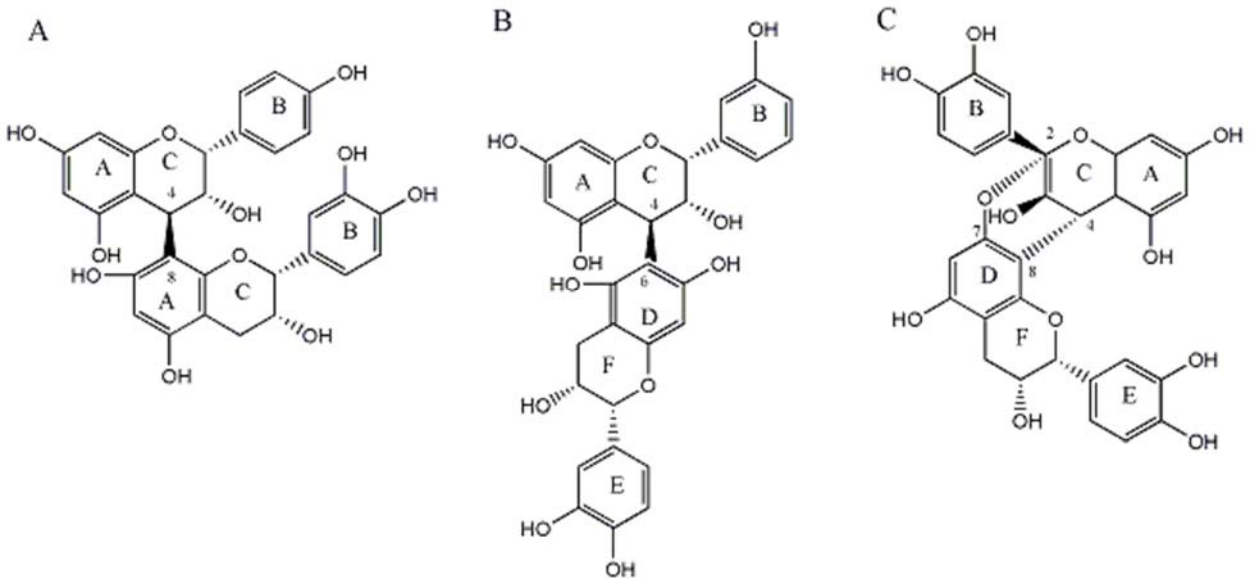


Figure 2. Common interflavan linkages found in proanthocyanidins extracted from foods. A) B type 4→8 linkage [Epicatechin-(4β→8)-epicatechin], B) B type 4→6 linkage [Epicatechin-(4β→6)-epicatechin], C) A type linkage [Epicatechin-(2β→7, 4β→8)-epicatechin]. From Porter, 1993.

Data Quality Evaluation

All data were evaluated for quality using the procedures developed by the NDL scientists (Holden, et al 2002). Categories of documentation evaluated include: sampling plan, sample handling, number of samples, analytical method and analytical quality control. The information presented in each manuscript was evaluated for each category, which then received a rating ranging from 0 to 20 points. The ratings for all the five categories were summed to yield a Quality Index (QI) with a maximum score of 100 points. The Confidence Code (CC) was derived from the QI and is an indicator of relative quality of the data and reliability of a given mean. Each food and compound in the database has a CC. Different foods from the same study may have different CCs depending on the sampling procedure used or the number of samples analyzed.

The CC was assigned as follows:

QI	CC
75-100	A
74-50	B
49-25	C
<25	D

Data Aggregation

Data for similar forms of a food were grouped and aggregated to match the food entries or food descriptions in SR. The Nutrient Data Bank (NDB) number, a five-digit numerical code used in SR, was assigned to each food in the PA database. When a food in the PA database was not included in SR, a temporary NDB number, beginning either with “97” or “99”, was assigned to that food. Though efforts were made to use the same temporary NDB number across the various special interest databases developed by NDL for a given food, there may be some cases where a particular food has more than one NDB No. The mean (mg/100g), standard deviation of the mean (SD), minimum (Min.) and maximum (Max.) values were then determined for each food and PA compound or group of compounds. The various studies reported values as either individual values or as means, with additional statistical information. As a result, means in the database may be calculated either from individual values or as a mean of means, or as a combination of these. Mean values per study were weighted to account for the different number of samples among the various studies used. The weighted mean from each data source was, in turn, used to calculate the standard deviation based on the total number of samples in each aggregated food. The data quality ratings for each category were reevaluated for the mean value of each food/compound, and therefore may change from those assigned to each individual food/compound in the separate studies. For example, number of samples in the aggregate may increase, which could increase the rating for that category. This, in turn, could also increase the QI and the CC. The values along with the confidence codes and sources of data are given in Table 1. Foods in Table 1are arranged by Food Groups as in SR and by alphabetical order within the Food Group.

Limitations of the Data

A review of these data for proanthocyanidins indicates variability in levels of specific PAs. A plant’s genetic predisposition dictates the biosynthesis of the primary (sugars, amino acids, etc.) and secondary metabolites (i.e. proanthocyanidins, saponins, alkaloids, etc.). Variability with respect to secondary metabolites can exist between varieties (or cultivars) of the same species. However, various environmental factors determine the extent to which genetic potentialities are achieved. Ecology, drought, soil type/structure, disease, herbivore damage, and farming practices (i.e. pruning, application of pesticides, etc.) do have an influence on secondary plant metabolism. The post-harvest handling (storage time, temperature, modified atmospheres, etc.) of fruits and vegetables can also impact metabolite levels. Processing effects such as heating, fermentation, shearing, etc. can influence the final levels of these compounds. Finally, variability in food component values may be attributable to the differences in analytical methods used to determine the values.

When food composition data are being reviewed and evaluated it is important to distinguish variability due to factors intrinsic to the food or food processing from factors inherent to the measurement process. It is not possible at this stage to separate the sources and magnitude of effects to biological or analytical variability. In this database

values came from limited sources and were based on a limited number of samples. This may also account for the apparent higher variability in the PA contents. Comparisons for raw and processed foods are not valid unless paired samples are used for both the raw and processed foods. Therefore, it is important to study the effects of processing on PA contents in the future studies.

As stated earlier, the PA values in this database may be underestimated for the lack of unextractable PA values. Therefore, this database should be used carefully in drawing conclusions about absolute values for PAs. Instead, as stated in the introductory paragraph, this database should be considered an important tool for developing hypotheses about the relationships between the intake of PAs and various disease states, to help develop and set priorities for continued investigation, characterization and improved quantitation of the PA content of foods.

Format of the Tables

The USDA Database for the Proanthocyanidin Content of Selected Foods is presented as a PDF file. This table contains values for individual flavonoid compounds for **285** foods. A user will need the Adobe® Acrobat® reader to view the report of the database. For the convenience of the user, the proanthocyanidin database is also available as a Microsoft® Access database (PA_R02.accdb). This database follows the same structure as that used for SR thus allowing users to access the database in a form compatible with other programs. Links indicating the relationships among the files are presented with each file.

The tables and fields in the Microsoft® Access database are as follows:

Food Description File (file name = FOOD_DES). This file (Table 2) contains the descriptions of the food items. For those items in the SR* additional information (e.g., common names, percentage, and description of refuse) can be obtained by linking this table to the corresponding table in SR.

- Links to the Food Group Description file by FdGrp_Cd
- Links to the Proanthocyanidin Data file by NDB No.
- Links to the Proanthocyanidin Detail file by NDB No.

Table 2.—Food Description File Format

Field Name	Description
NDB_No†	5-Digit Nutrient Databank number that uniquely identifies a food item. Foods in the USDA Database on the Proanthocyanidin content of Foods which do not have corresponding entries in SR* are assigned NDB Nos. starting with either ‘99’ or ‘97’.

FdGrp_Cd	4-digit code indicating food group to which the food item belongs
Long_Desc	Description of the food item
SciName	Scientific name of the food item. Generally given for the least processed form of the food (usually raw), if applicable.

* For more information on SR, see the NDL Web site (http://www.ars.usda.gov/nutrientdata) or contact the Nutrient Data Laboratory, 10300 Baltimore Avenue, Bldg. 005, Rm. 107, BARC-WEST, Beltsville, MD 20705. Tel. No. 301-504-0630, e-mail: ndlinfo@ars.usda.gov.

†Primary key for the food description file

Food Group Description File (file name = FD_GROUP). This file (Table 3) contains a list of food groups used in the proanthocyanidin database and their descriptions.

- Links to the Food Description file by FdGrp_Cd

Table 3.—Food Group Description File Format

Field Name	Description
FdGrp_Cd*	4-digit code identifying a food group. Only the first two digits are currently assigned. All of the food groups in SR are not used in the proanthocyanidin database.
FdGrp_Desc	Name of food group

* Primary key for the Food Group Description file.

Proanthocyanidin Data File (file name = PA_DAT)**.** This file (Table 4) contains the flavonoid values and information about the values, including statistical information, confidence codes, and sources of data.

- Links to the Food Description file by NDB No.
- Links to the Nutrient Definition file by Nutr. No.
- Links to the Sources of Data file by DataSrc_ID through the Data Source Link file

Table 4.— Proanthocyanidin Data File Format

Field Name	Description
NDB No.*	5-Digit Nutrient Databank number
Nutr_No*	Unique 3-digit identifier code for each proanthocyanidin compound
PA_Val	The proanthocyanidin mean value (mg/100 g) edible portion

SD	Standard deviation of the mean; null if could not be calculated
n	Number of data points used in calculating the mean value and SD
Min	Minimum value (mg/100 g) from data points used
Max	Maximum value (mg/100 g) from data points used
CC	Confidence Code, designated as A, B, C, or D as determined through the DQES

* Primary keys for proanthocyanidin Data file.

Nutrient Definition File (file name = NUTR_DEF). This file (Table 5) contains the nutrient number and the description of the proanthocyanidin.

- Links to the Nutrient Data file by Nutr_No.

Table 5.—Nutrient Definition File Format

Field Name	Description
Nutr_No*	Unique 3-digit identifier code for each proanthocyanidin
Description	Name of the proanthocyanidin
Unit	Units of measure (e.g. mg)

* Primary key for Nutrient Definition file.

Sources of Data Link File (file name = DATSRCLN). This file (Table 6) is used to link the Proanthocyanidin Data file with the Sources of Data file. It is needed to resolve the many-to-many relationship between the two files.

- Links to the Proanthocyanidin Data file by NDB No. and Nutr_No.
- Links to the Sources of Data file by DataSrc_ID.

Table 6.—Sources of Data Link File Format

Field Name	Description
NDB_No*	5-digit Nutrient Databank number
Nutr_No*	Unique 3-digit identifier code for a nutrient
DataSrc_ID*	Unique ID identifying the reference/source. This is the reference number from the Sources of Data, preceded with an “R”.

* Primary keys for the Sources of Data Link file.

Sources of Data File (file name = DATA_SRC). This file (Table 7) provides a citation to the DataSrc_ID in the Sources of Data Link file.

- Links to Proanthocyanidin Data file by NDB No. through the Sources of Data Link file

Table 7.—Sources of Data File Format

Field Name	Description
DataSrc_ID*	Unique number identifying the reference/source. This is the reference number from the Sources of Data, preceded with an “R”.
Authors	List of authors for a journal article or name of sponsoring organization for other documents
Title	Title of article or name of document, such as a report from a company or trade association
Year	Year article or document was published
Journal	Name of the journal in which the article was published
Vol	Volume number for journal articles, books, or reports
Start_Page	Starting page number of article/document
End_Page	Ending page number of article/document

* Primary key for the Sources of Data file.

References Cited in the Documentation

Bhagwat S., Haytowitz D.B., Holden, J.M. (Ret.). 2013. USDA Database for Flavonoid Content of Selected Foods, Release 3.1, U.S. Dapartment of Agriculture, Agricultural Research Service, Nutrient Data Laboratory Home Page: http://www.ars.usda.gov/nutrientdata/flav. (Accessed 8 July 2015)

Gu, L., Kelm, M.A., Hammerstone, J.F., Beecher, G., Holden J., Haytowitz, D.B., and Prior, R.L. Screening of foods containing proanthocyanidins and their structural characterization using LC-MS/MS and thiolytic degradation. *J.Agric. Food Chem., 2003,51:7513-7521.*

Gu, L., Kelm, M.A., Hammerstone, J.F., Beecher, G., Cunningham, D., Vannozzi, S., and Prior, R.L. Fractionation of polymeric proanthocyanidins from lowbush blueberry and quantification of procyanidins in selected foods with an optimized normal-phase HPLC-MS fluorescent detection method. *J. Agric. Food Chem., 2002, 50:4852-4860.*

Hammerstone, J.F., Lazarus, S.A., Mitchell, A.E., Rucker, R., and Schmitz, H.H. Identification of procyanidins in cocoa (*Theobroma cacao*) and chocolate using high-performance liquid chromatography/mass spectrometry. *J. Agric. Food Chem., 1999, 47:490-496.*

Hellström, J.K. and Mattila, P.H. HPLC determination of extractable and unextractable proanthocyanidins in plant materials. *J. Agric. Food Chem., 2009, 56:7617-7624.*

Howell, A.B., Reed, J.D., Krueger, C.G., Winterbottom, R., Cunningham, D.G., and Leahy, M. A-type cranberry proanthocyanidins and uropathogenic bacterial anti-adhesion activity. *Phytochem., 2005, 66:2281-2291.*

Khanal, R., Howard, L.R., and Prior, R.L. Procyanidin composition of selected fruits and fruit byproducts is affected by extraction method and variety. *J. Agric. Food Chem., 2009, 57:8839-8843.*

Lin, L-Z., Sun, J., Chen, P., Monagas, M., and Harnly, J.M. UHPLC-PDA-ESI/HRMS^n profiling method to identify and quantify oligomeric proanthocyanidins in plant products. *J. Agric. Food Chem., 2014, 62:9387-9400.*

Mangels, A.R., Holden, J.M., Beecher, G.R., Forman. M.R., and Lanza, E. Carotenoid content of fruits and vegetables"an evaluation of analytic data. *J. Am. Diet. Assoc., 1993, 93:284-296.*

Pérez-Jiménez, J., Arranz, S., and Saura-Calixo, F. Proanthocyanidin content in foods is largely underestimated in the literature data: An approach to quantification of the missing proanthocyanidins. *Food Res. Int., 2009, 42:1381-1388.*

Porter LJ. Flavans and proanthocyanidins. In: *The flavonoids, Advances in research since 1986*. Harborne JB, ed.; Chapman & Hall, London, U.K., pp 23–53.

Rossi M, Lugo A, Lagiou P, Zucchetto A, Polesel J, Serraino D, et al. Proanthocyanidins and other flavonoids in relation to pancreatic cancer: a case-control study in Italy. *Ann. Oncol., 2012, 23:1488-1493.*

Rossi, M., Negri, E., Parpinet, M., Lagiou, P., Bosetti, C., Talamini, R., et al. proanthocyanidins and the risk of colorectal cancer in Italy. *Cancer Causes Control, 2010, 21:243-250.*

Santos-Buelga, C. and Scalbert, A. Proanthocyanidins and tannin-like compounds – nature, occurrence, dietary intake and effects on nutrition and health. *J. Sci. Food Agric., 2000, 80:1094-1117.*

U.S. Dapartment of Agriculture, Agricultural Research Service, 2004. USDA Database for Proanthocyanidin Content of Selected Foods. Nutrient Data Laboratory Home Page: http://www.ars.usda.gov/nutrientdata/flav (Accessed 8 July 2015)

U.S. Departmant of Agriculture, Agricultural Service. 2014. USDA National Nutrient Database for Standard Reference (SR), Release 27. http://www.ars.usda.gov/nutrientdata. (Accessed 8 July 2015)

Wang, X., Jun, Y.Y., and Zhao, G. Flavonoid intake and risk of CVD: a systematic review and meta-analysis of prospective cohort studies. *Brit. J. Nutr., 2014, 111: 1-11.*

Table 1. USDA Database for the Proanthocyanidin Content of Selected Foods, Release 2.1 – 2018

(for mean, standard deviation, min and max, units = mg/100 g, edible portion; blank cells indicate values were not reported)

NDB No.	Description	Proanthocyanidin	Mean[1]	N	SD	Min	Max	CC	Sources of Data
01 – Dairy and Eggs									
01102	Milk, chocolate, fluid, commercial, whole, with added vitamin A and vitamin D	Dimers	2.18	2		2.15	2.21	B	23
		Trimers	0.00	2		0.00	0.00	B	23
		4-6mers	0.00	2		0.00	0.00	B	23
		7-10mers	0.00	2		0.00	0.00	B	23
		Polymers	0.00	2		0.00	0.00	B	23
02 – Spices and Herbs									
02003	Spices, basil, dried (*Ocimum basilicum*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
02009	Spices, chili powder	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
02010	Spices, cinnamon, ground (*Cinnamomum aromaticum*)	Dimers	256.29	1				B	23
		Trimers	1252.20	1				B	23
		4-6mers	2608.63	1				B	23
		7-10mers	1458.32	1				B	23
		Polymers	2508.78	1				B	23
02011	Spices, cloves, ground (*Syzygium aromaticum*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
02015	Spices, curry powder	Dimers	9.50	1				B	23
		Trimers	22.88	1				B	23
		4-6mers	41.78	1				B	23
		7-10mers	0.00	1				B	23
		Polymers	0.00	1				B	23
02020	Spices, garlic powder (*Allium sativum*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
02021	Spices, ginger, ground (*Zingiber officinale*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
02024	Spices, mustard seed, ground (*Sinapis alba and Brassica juncea*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
02026	Spices, onion powder (*Allium cepa*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
02027	Spices, oregano, dried (*Origanum vulgare*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
02028	Spices, paprika (*Capsicum annuum*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24

[1] Table contains data for those compounds where analytical data were available; lack of data does not mean the compound is not present in a particular food.

Table 1. USDA Database for the Proanthocyanidin Content of Selected Foods, Release 2.1 – 2018

(for mean, standard deviation, min and max, units = mg/100 g, edible portion; blank cells indicate values were not reported)

NDB No.	Description	Proanthocyanidin	Mean[1]	N	SD	Min	Max	CC	Sources of Data
02029	Spices, parsley, dried (*Petroselinum crispum*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
02030	Spices, pepper, black (*Piper nigrum*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
02033	Spices, poppy seed (*Papaver somniferum*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
02043	Spices, turmeric, ground (*Curcuma longa L.*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
03 - Babyfoods									
03181	Babyfood, cereal, barley, dry	Dimers	9.30	2				B	23
		Trimers	4.50	2				B	23
		4-6mers	4.10	2				B	23
		7-10mers	0.00	2				B	23
		Polymers	0.00	2				B	23
97025	Babyfood, dessert, blueberry buckle	Dimers	1.80	2				B	23
		Trimers	1.30	2				B	23
		4-6mers	5.30	2				B	23
		7-10mers	4.40	2				B	23
		Polymers	4.40	2				B	23
03225	Babyfood, dessert, cherry vanilla pudding, junior	Dimers	2.70	2				B	23
		Trimers	1.70	2				B	23
		4-6mers	5.20	2				B	23
		7-10mers	2.90	2				B	23
		Polymers	0.00	2				B	23
03165	Babyfood, fruit, apple and blueberry, junior	Dimers	5.10	2				B	23
		Trimers	2.80	2				B	23
		4-6mers	7.80	2				B	23
		7-10mers	5.20	2				B	23
		Polymers	2.20	2				B	23
97020	Babyfood, fruit, apple, strawberry, banana	Dimers	7.30	2				B	23
		Trimers	4.30	2				B	23
		4-6mers	14.90	2				B	23
		7-10mers	10.60	2				B	23
		Polymers	14.00	2				B	23
97018	Babyfood, fruit, apples, organic	Dimers	8.90	2				B	23
		Trimers	5.10	2				B	23
		4-6mers	17.80	2				B	23
		7-10mers	12.30	2				B	23
		Polymers	14.80	2				B	23
03116	Babyfood, fruit, applesauce, strained	Dimers	6.40	2				B	23
		Trimers	3.60	2				B	23
		4-6mers	9.80	2				B	23
		7-10mers	6.10	2				B	23
		Polymers	0.00	2				B	23
97021	Babyfood, fruit, apricots with pears and apples	Dimers	3.40	2				B	23
		Trimers	2.30	2				B	23
		4-6mers	7.60	2				B	23
		7-10mers	4.60	2				B	23
		Polymers	0.00	2				B	23
97022	Babyfood, fruit, banana plum and grape	Dimers	2.50	2				B	23
		Trimers	1.90	2				B	23
		4-6mers	8.10	2				B	23

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NDB No.	Description	Proanthocyanidin	Mean[1]	N	SD	Min	Max	CC	Sources of Data
		7-10mers	7.10	2				B	23
		Polymers	4.40	2				B	23
97024	Babyfood, fruit, banana strawberry	Dimers	1.00	2				B	23
		Trimers	0.90	2				B	23
		4-6mers	3.80	2				B	23
		7-10mers	3.30	2				B	23
		Polymers	2.80	2				B	23
97017	Babyfood, fruit, bananas	Dimers	0.00	2				B	23
		Trimers	0.00	2				B	23
		4-6mers	0.00	2				B	23
		7-10mers	0.00	2				B	23
		Polymers	0.00	2				B	23
03130	Babyfood, fruit, peaches, strained	Dimers	3.80	4	0.33	3.40	4.20	B	23
		Trimers	2.80	4	0.08	2.70	2.90	B	23
		4-6mers	8.75	4	0.69	7.90	9.60	B	23
		7-10mers	5.75	4	0.45	5.20	6.30	B	23
		Polymers	0.00	4	0.00	0.00	0.00	B	23
03132	Babyfood, fruit, pears, strained	Dimers	2.65	4	0.45	2.10	3.20	B	23
		Trimers	1.80	4	0.24	1.50	2.10	B	23
		4-6mers	5.70	4	0.57	5.00	6.40	B	23
		7-10mers	3.65	4	0.04	3.60	3.70	B	23
		Polymers	0.00	4	0.00	0.00	0.00	B	23
97023	Babyfood, fruit, plums with apples	Dimers	4.00	2				B	23
		Trimers	2.70	2				B	23
		4-6mers	10.30	2				B	23
		7-10mers	7.40	2				B	23
		Polymers	7.30	2				B	23
43007	Babyfood, fruit, tutti frutti, junior	Dimers	0.00	2				B	23
		Trimers	0.00	2				B	23
		4-6mers	0.00	2				B	23
		7-10mers	0.00	2				B	23
		Polymers	0.00	2				B	23
44074	Babyfood, grape juice, no sugar, canned	Dimers	0.19	2				B	23
		Trimers	0.19	2				B	23
		4-6mers	0.37	2				B	23
		7-10mers	0.00	2				B	23
		Polymers	0.00	2				B	23
03166	Babyfood, juice, apple	Dimers	0.19	2				B	23
		Trimers	0.19	2				B	23
		4-6mers	0.47	2				B	23
		7-10mers	0.09	2				B	23
		Polymers	0.00	2				B	23
43408	Babyfood, juice, pear	Dimers	0.09	2				B	23
		Trimers	0.09	2				B	23
		4-6mers	0.00	2				B	23
		7-10mers	0.00	2				B	23
		Polymers	0.00	2				B	23
03091	Babyfood, vegetables, green beans, strained	Dimers	0.00	2				B	23
		Trimers	0.00	2				B	23
		4-6mers	0.00	2				B	23
		7-10mers	0.00	2				B	23
		Polymers	0.00	2				B	23
03121	Babyfood, vegetables, peas, strained	Dimers	0.00	2				B	23
		Trimers	0.00	2				B	23
		4-6mers	0.00	2				B	23
		7-10mers	0.00	2				B	23
		Polymers	0.00	2				B	23
03104	Babyfood, vegetables, squash, strained	Dimers	0.00	2				B	23
		Trimers	0.00	2				B	23
		4-6mers	0.00	2				B	23
		7-10mers	0.00	2				B	23
		Polymers	0.00	2				B	23
09 – Fruits and Fruit Juices									
99083	Apple cider [European]	Dimers	0.29	6	0.42	0.00	1.06	B	14, 26

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NDB No.	Description	Proanthocyanidin	Mean[1]	N	SD	Min	Max	CC	Sources of Data
		Trimers	0.11	6	0.26	0.00	0.65	B	14, 26
		4-6mers	0.19	3	0.33	0.00	0.58	C	26
		7-10mers	0.00	3	0.00	0.00	0.00	C	26
		Polymers	0.00	3	0.00	0.00	0.00	C	26
09016	Apple juice, canned or bottled, unsweetened, without added ascorbic acid (*Malus domestica*)	Dimers	4.40	32	4.93	0.00	17.07	B	23, 26, 33, 40, 43, 54, 57, 58
		Trimers	2.70	15	3.82	0.00	11.52	B	23, 26, 43, 57, 58
		4-6mers	13.31	7	17.58	0.00	49.98	B	23, 26, 43
		7-10mers	0.06	3	0.05	0.00	0.10	B	23, 26
		Polymers	0.00	3	0.00	0.00	0.00	B	23, 26
09504	Apples, raw, fuji, with skin (*Malus domestica*)	Dimers	9.92	4	2.64	6.48	12.90	B	23
		Trimers	6.09	4	1.43	4.29	7.78	B	23
		4-6mers	19.09	4	4.31	13.76	24.32	B	23
		7-10mers	13.81	4	2.79	10.62	17.43	B	23
		Polymers	14.22	4	3.06	11.18	18.48	B	23
09503	Apples, raw, gala, with skin (*Malus domestica*)	Dimers	9.55	3	0.30	9.26	9.86	B	23
		Trimers	6.24	3	0.23	6.05	6.49	B	23
		4-6mers	21.28	3	1.51	19.93	22.91	B	23
		7-10mers	18.73	3	1.36	17.74	20.28	B	23
		Polymers	30.68	3	5.56	26.63	37.02	B	23
09501	Apples, raw, golden delicious, with skin (*Malus domestica*)	Dimers	7.36	18	1.64	4.58	10.60	B	14, 23, 31
		Trimers	4.73	7	1.37	2.88	6.40	B	14, 23
		4-6mers	21.77	4	1.21	20.58	23.17	B	23
		7-10mers	18.75	4	1.01	17.55	19.98	B	23
		Polymers	26.46	4	2.77	23.17	29.78	B	23
97068	Apples, raw, golden delicious, without peel (*Malus domestica*)	Dimers	8.92	12	7.67	6.00	34.16	B	8, 23
		Trimers	5.79	2		5.44	6.13	B	23
		4-6mers	21.16	2		19.31	23.01	B	23
		7-10mers	17.54	2		15.27	19.80	B	23
		Polymers	22.40	2		18.39	26.40	B	23
09502	Apples, raw, granny smith, with skin (*Malus domestica*)	Dimers	12.90	13	2.53	9.71	18.37	B	14, 23, 26
		Trimers	8.59	8	1.55	7.07	11.35	A	14, 23, 26
		4-6mers	30.78	5	6.94	22.30	41.55	B	23, 26
		7-10mers	25.92	5	10.80	9.10	39.26	B	23, 26
		Polymers	38.77	5	18.77	8.60	59.93	B	23, 26
09500	Apples, raw, red delicious, with skin (*Malus domestica*)	Dimers	12.64	17	3.88	7.91	25.50	B	14, 23, 26
		Trimers	11.75	8	5.04	6.44	23.20	A	14, 23, 26
		4-6mers	32.77	5	10.30	21.37	49.50	B	23, 26
		7-10mers	23.11	5	5.99	15.10	30.35	B	23, 26
		Polymers	36.75	5	11.84	21.60	54.25	B	23, 26
97071	Apples, raw, Red Delicious, without peel (*Malus domestica*)	Dimers	14.80	3	6.19	10.17	21.83	B	23
		Trimers	7.18	2		6.48	7.88	B	23
		4-6mers	24.33	2		21.95	26.71	B	23
		7-10mers	20.31	2		18.11	22.51	B	23
		Polymers	28.75	2		23.75	33.75	B	23
99002	Apples, raw, skin only (*Malus domestica*)	Dimers	29.38	37	8.49	12.00	60.00	B	8, 62
09003	Apples, raw, with skin (*Maleus domesticus*)	Dimers	13.23	185	13.06	1.02	105.81	A	6, 10, 14, 23, 26, 31, 45, 62, 64
		Trimers	8.04	39	3.18	2.88	23.20	B	14, 23, 26
		4-6mers	24.68	27	7.94	11.60	49.50	B	23, 26
		7-10mers	19.21	27	7.49	4.30	39.26	B	23, 26
		Polymers	28.80	27	13.27	5.20	59.93	B	23, 26
09004	Apples, raw, without skin (*Malus domestica*)	Dimers	12.28	39	12.37	0.00	79.55	B	8, 23, 61
		Trimers	6.48	4	1.03	5.44	7.88	B	23
		4-6mers	22.75	4	3.07	19.31	26.71	B	23
		7-10mers	18.92	4	3.04	15.27	22.51	B	23
		Polymers	25.57	4	6.39	18.39	33.75	B	23
09021	Apricots, raw (*Prunus armeniaca*)	Dimers	9.37	68	4.13	0.15	23.61	B	14, 15, 23, 52
		Trimers	12.41	62	5.51	0.01	42.10	B	14, 23, 52
		4-6mers	4.90	2				B	23
		7-10mers	2.20	2				B	23
		Polymers	0.80	2				B	23
99043	Arctic bramble berries (*Rubus arcticum L.*)	Dimers	2.60	1				D	35

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NDB No.	Description	Proanthocyanidin	Mean[1]	N	SD	Min	Max	CC	Sources of Data
09037	Avocados, raw, all commercial varieties (*Persea armericana*)	Dimers	1.18	12	0.87	0.02	3.28	B	14, 23, 26
		Trimers	1.12	12	0.79	0.00	2.60	B	14, 23, 26
		4-6mers	3.35	9	2.01	0.00	5.79	B	23, 26
		7-10mers	0.52	9	0.70	0.00	1.96	B	23, 26
		Polymers	0.00	9	0.00	0.00	0.00	B	23, 26
09040	Bananas, raw (*Musa acuminata*)	Dimers	0.38	8	0.30	0.00	0.80	B	14, 23, 26
		Trimers	0.42	8	0.40	0.00	0.94	B	14, 23, 26
		4-6mers	1.86	5	1.11	0.00	2.98	B	23, 26
		7-10mers	0.00	5	0.00	0.00	0.00	B	23, 26
		Polymers	0.00	5	0.00	0.00	0.00	B	23, 26
99065	Bilberry soup	Dimers	0.55	1				C	26
		Trimers	0.51	1				C	26
		4-6mers	0.55	1				C	26
		7-10mers	0.58	1				C	26
		Polymers	0.15	1				C	26
99357	Bilberry, raw (*Vaccinium myrtillus*)	Dimers	6.23	6	1.04	5.20	8.10	B	26
		Trimers	8.90	6	2.81	6.40	14.20	B	26
		4-6mers	14.80	6	5.73	8.70	25.40	B	26
		7-10mers	7.33	6	3.55	0.70	11.30	B	26
		Polymers	53.25	6	17.72	32.60	85.30	B	26
99007	Black Currant Juice	Dimers	0.35	1				C	26
		Trimers	0.13	1				C	26
		4-6mers	0.38	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	3.50	1				C	26
09042	Blackberries, raw (*Rubus fructicosus*)	Dimers	4.45	7	3.00	1.46	9.50	A	14, 23
		Trimers	2.11	7	2.03	0.06	5.84	A	14, 23
		4-6mers	7.27	4	5.02	3.47	14.56	B	23
		7-10mers	4.24	4	4.47	0.64	10.76	B	23
		Polymers	1.51	4	3.02	0.00	6.04	B	23
99667	Blueberries, canned in water, solid and liquid (*Vaccinium*)	Dimers	4.68	15	0.34	3.66	5.33	B	7
		Trimers	2.63	15	0.29	2.09	3.50	B	7
		4-6mers	5.23	15	0.42	4.19	6.42	B	7
		7-10mers	1.11	15	0.18	0.58	1.43	B	7
09052	Blueberries, canned, heavy syrup, solids and liquids (*Vaccinium*)	Dimers	4.83	15	0.53	3.69	6.39	B	7
		Trimers	1.96	15	0.31	1.38	2.91	B	7
		4-6mers	3.53	15	0.86	0.93	5.21	B	7
		7-10mers	0.28	15	0.10	0.00	0.53	B	7
09054	Blueberries, frozen, unsweetened (*Vaccinium*)	Dimers	6.07	5	0.33			C	7
		Trimers	5.37	5	0.51			C	7
		4-6mers	18.70	5	0.53			C	7
		7-10mers	3.85	5	0.78			C	7
09050	Blueberries, raw (*Vaccinium myrtillus*)	Dimers	6.44	12	3.24	1.66	14.50	A	14, 23, 26
		Trimers	4.91	12	3.01	0.73	13.30	A	14, 23, 26
		4-6mers	20.52	9	4.24	15.75	28.10	A	23, 26
		7-10mers	14.32	9	2.02	10.99	17.40	A	23, 26
		Polymers	136.04	9	48.98	58.37	200.62	A	23, 26
97085	Blueberries, wild, raw (*Vaccinium corymbosum*)	Dimers	8.45	3	0.86	7.36	9.00	B	23, 25
		Trimers	6.56	3	0.38	6.08	6.80	B	23, 25
		4-6mers	25.99	3	0.45	25.70	26.56	B	23, 25
		7-10mers	29.31	3	2.38	27.80	32.32	B	23, 25
		Polymers	255.09	3	8.39	244.48	260.40	B	23, 25
99326	Bog whortleberries, wild, frozen (*Vaccinium uliginosum*)	Dimers	19.80	1				C	26
		Trimers	18.60	1				C	26
		4-6mers	33.30	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.92	1				C	26
09070	Cherries, sweet, raw (*Prunus avium*)	Dimers	3.45	8	0.84	2.38	4.80	B	14, 23, 26
		Trimers	2.71	8	0.94	1.85	4.90	B	14, 23, 26
		4-6mers	6.65	5	0.78	5.96	7.74	B	23, 26
		7-10mers	1.82	5	0.15	1.60	2.03	B	23, 26
		Polymers	0.00	5	0.00	0.00	0.00	B	23, 26
99012	Chokeberry, raw (*Aronia melanocarpa*)	Dimers	7.82	8	3.90	3.20	12.50	B	23, 26, 65
		Trimers	6.75	8	3.08	2.60	10.30	B	23, 26, 65

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NDB No.	Description	Proanthocyanidin	Mean[1]	N	SD	Min	Max	CC	Sources of Data
		4-6mers	23.02	8	13.77	3.90	40.32	B	23, 26, 65
		7-10mers	26.50	8	20.09	1.30	52.90	B	23, 26, 65
		Polymers	1265.98	8	591.54	542.60	1990.00	B	23, 26, 65
99337	Cloudberries, raw (*Rubus chamaemorus*)	Dimers	5.90	2		0.40	11.40	C	26, 35
		Trimers	6.00	1				C	26
		4-6mers	7.30	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
09079	Cranberries, dried, sweetened	Dimers	5.09	9	2.54	0.85	7.70	B	21, 41a
		Trimers	4.43	6	3.43	0.61	7.58	B	41a
		4-6Mers	10.07	6	7.87	1.84	19.53	B	41a
		7-10Mers	0.33	6	0.81	0.00	1.99	B	41a
		Polymers	345.89	6	248.65	71.52	611.21	B	41a
09078	Cranberries, raw (*Vaccinium macrocarpon Ait.)*	Dimers	20.40	16	7.66	8.80	33.16	B	21, 23, 25, 26, 41a
		Trimers	29.16	13	16.95	8.10	63.62	A	23, 25, 26, 41a
		4-6mers	86.19	13	41.93	22.00	163.38	A	23, 25, 26, 41a
		7-10mers	61.23	13	33.29	7.70	118.29	A	23, 25, 26, 41a
		Polymers	1004.30	13	911.25	148.00	2181.79	A	23, 25, 26, 41a
99110	Cranberry juice, raw	Trimers	0.15	1				C	40
09526	Cranberry sauce, jellied, canned, OCEAN SPRAY	Dimers	2.54	4	1.65	1.02	4.21	B	41a
		Trimers	4.02	4	2.51	1.84	6.30	B	41a
		4-6Mers	5.22	4	4.82	1.93	12.29	B	41a
		7-10Mers	0.00	4	0.00	0.00	0.00	B	41a
		Polymers	137.90	4	72.60	52.31	228.18	B	41a
09525	Cranberry sauce, whole, canned, OCEAN SPRAY	Dimers	2.14	4	2.34	0.05	4.21	B	41a
		Trimers	3.44	4	3.79	0.05	7.24	B	41a
		4-6Mers	6.93	4	7.72	0.07	13.70	B	41a
		7-10Mers	0.00	4	0.00	0.00	0.00	B	41a
		Polymers	128.73	4	140.47	7.85	277.50	B	41a
09081	Cranberry sauce, canned, sweetened (*Vaccinium macrocarpon Ait.*)	Dimers	4.43	9	1.46	1.20	6.90	C	21
99339	Crowberries, raw (*Empetrum nigrum*)	Dimers	35.90	1				C	26
		Trimers	21.20	1				C	26
		4-6mers	32.50	1				C	26
		7-10mers	23.10	1				C	26
		Polymers	57.70	1				C	26
09083	Currants, european black, raw (*Riges nigrum*)	Dimers	2.91	11	0.43	2.20	3.56	B	23, 26, 65
		Trimers	2.19	11	0.49	1.20	3.00	B	23, 26, 65
		4-6mers	7.75	11	2.53	2.80	10.60	B	23, 26, 65
		7-10mers	7.21	11	4.38	0.00	10.86	B	23, 26, 65
		Polymers	135.08	11	39.90	98.70	227.00	B	23, 26, 65
99044	Currants, red, raw (*Ribes rubrum*)	Dimers	2.11	5	0.41	1.90	2.90	C	14, 26, 65
		Trimers	0.77	5	0.94	0.00	2.30	C	14, 26, 65
		4-6mers	5.54	2		4.20	6.87	C	26, 65
		7-10mers	3.95	2		0.00	7.90	C	26, 65
		Polymers	32.60	2		24.00	41.20	C	26, 65
09086	Custard-apple, (bullock's-heart), raw (*Annona reticulata*)	Dimers	14.20	3				C	14
		Trimers	4.49	3				C	14
09087	Dates, deglet noor (*Phoenix dactylifera*)	Dimers	1.84	7	0.48	1.28	2.57	A	23
		Trimers	3.02	7	0.46	2.34	3.67	A	23
		4-6mers	5.88	7	0.68	4.78	6.70	A	23
		7-10mers	0.00	7	0.00	0.00	0.00	A	23
		Polymers	0.00	7	0.00	0.00	0.00	A	23
09088	Elderberries, raw (*Sambucus nigra*)	Dimers	10.62	1				C	65
		trimers	5.63	1				C	65
		4-6mers	10.80	1				C	65
		7-10mers	0.00	1				C	65
		Polymers	0.00	1				C	65
09089	Figs, raw (*Ficus carica*)	Dimers	0.01	11	0.01	0.00	0.03	A	14, 23
		Trimers	0.00	11	0.00	0.00	0.00	A	14, 23
		4-6mers	0.00	8	0.00	0.00	0.00	A	23
		7-10mers	0.00	8	0.00	0.00	0.00	A	23

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(for mean, standard deviation, min and max, units = mg/100 g, edible portion; blank cells indicate values were not reported)

NDB No.	Description	Proanthocyanidin	Mean[1]	N	SD	Min	Max	CC	Sources of Data
		Polymers	0.00	8	0.00	0.00	0.00	A	23
09107	Gooseberries, raw (*Ribesuva-crispa*)	Dimers	1.72	8	0.66	1.00	2.80	B	26, 65
		Trimers	1.45	8	0.97	0.79	3.70	B	26, 65
		4-6mers	4.76	8	1.74	1.30	6.92	B	26, 65
		7-10mers	4.74	8	2.81	0.00	8.55	B	26, 65
		Polymers	68.88	8	31.09	35.40	115.00	B	26, 65
09135	Grape juice, canned or bottled, unsweetened, without added ascorbic acid	Dimers	3.18	2				B	23
		Trimers	1.19	3	0.94	0.00	1.78	B	23, 40
		4-6mers	7.49	2				B	23
		7-10mers	6.46	2				B	23
		Polymers	28.37	2				B	23
09124	Grapefruit juice, white, canned, sweetened (*N/A*)	Dimers	0.00	1				C	40
09112	Grapefruit, raw, pink and red, all areas (*Citrus paradisi*)	Dimers	0.00	3	0.00	0.00	0.00	B	24, 26
		Trimers	0.00	3	0.00	0.00	0.00	B	24, 26
		4-6mers	0.00	3	0.00	0.00	0.00	B	24, 26
		7-10mers	0.00	3	0.00	0.00	0.00	B	24, 26
		Polymers	0.00	3	0.00	0.00	0.00	B	24, 26
97074	Grapes, red, raw (*Vitis labruca*)	Dimers	2.37	10	1.32	1.24	5.26	B	14, 23, 26, 44
		Trimers	1.08	8	0.46	0.38	1.64	B	14, 23, 26
		4-6mers	5.39	5	1.69	2.70	7.00	B	23, 26
		7-10mers	4.98	5	2.94	0.00	7.44	B	23, 26
		Polymers	36.41	5	20.14	3.80	54.31	B	23, 26
97003	Grapes, seeds, raw (*Vitis vinifera*)	Dimers	360.88	51	590.56	16.00	3197.70	A	12, 13, 18, 23, 39, 50
		Trimers	44.07	49	113.57	0.00	687.50	B	12, 13, 18, 23, 39, 50
		4-6mers	664.00	1				B	23
		7-10mers	400.30	1				B	23
		Polymers	1100.10	1				B	23
97004	Grapes, skins, raw (*Vitis vinifera*)	Dimers	35.31	16	23.20	0.00	82.95	B	12, 13, 39, 50
		Trimers	7.32	14	6.21	0.00	18.00	B	12, 13, 39, 50
99047	Grapes, white or green, raw (*Vitis labruca*)	Dimers	1.91	8	0.60	1.01	2.90	B	14, 23, 26
		Trimers	1.28	8	0.69	0.20	2.10	B	14, 23, 26
		4-6mers	7.40	5	2.14	3.60	8.68	B	23, 26
		7-10mers	7.32	5	4.12	0.00	9.90	B	23, 26
		Polymers	50.95	5	21.53	19.30	79.18	B	23, 26
97014	Hops (*Humuls lupulus*)	Dimers	84.10	4	44.82	42.80	147.20	C	29
		Trimers	51.53	4	25.32	28.70	87.50	C	29
99436	Juice, grape, red (*Vitus labrusca*)	Dimers	4.51	18	0.89	3.12	6.57	B	17
		Trimers	0.82	19	0.28	0.00	1.27	B	17, 40
99050	Juice, grape, white	Dimers	0.24	1				C	56
		Trimers	0.00	1				C	56
97016	Juice, pear (*Pyrus communis*)	Dimers	0.00	3	0.00	0.00	0.00	C	55
		Trimers	0.00	3	0.00	0.00	0.00	C	55
09148	Kiwifruit, green, raw (*Actinidia deliciosa*)	Dimers	0.63	12	0.22	0.14	0.87	A	14, 23, 26
		Trimers	0.51	12	0.19	0.11	0.77	A	14, 23, 26
		4-6mers	1.25	9	0.91	0.00	2.43	A	23, 26
		7-10mers	0.17	9	0.26	0.00	0.54	A	23, 26
		Polymers	0.00	9	0.00	0.00	0.00	A	23, 26
09159	Limes, raw (*Citrus latifolia*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
99021	Lingonberries [cowberries], raw (*Vaccinium vitis-idaea*)	Dimers	56.20	6	16.67	32.50	76.10	B	26
		Trimers	51.62	6	17.13	29.70	76.00	B	26
		4-6mers	79.72	6	33.40	52.30	140.00	B	26
		7-10mers	33.93	6	20.45	13.30	69.30	B	26
		Polymers	103.58	6	53.84	47.40	184.00	B	26
09176	Mangos, raw (*Mangifera indica*)	Dimers	1.80	1				B	23
		Trimers	1.40	1				B	23
		4-6mers	7.20	1				B	23
		7-10mers	0.00	1				B	23
		Polymers	0.00	1				B	23

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NDB No.	Description	Proanthocyanidin	Mean[1]	N	SD	Min	Max	CC	Sources of Data
97011	Marionberries, raw (*Rubus fructiciosus*)	Dimers	3.40	2				B	23
		Trimers	2.40	2				B	23
		4-6mers	2.20	2				B	23
		7-10mers	0.00	2				B	23
		Polymers	0.00	2				B	23
97005	Medlar , raw (*Mespilus germanica*)	Dimers	1.30	3				C	14
		Trimers	0.63	3				C	14
09181	Melons, cantaloupe, raw (*Cucumis melo*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
09184	Melons, honeydew, raw (*Cucumis melo*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
97049	Nectarines, white, whole, raw (*Prunus perisca*)	Dimers	11.93	10	14.87	0.13	39.91	B	60
09191	Nectarines, yellow, raw (*Prunus persica var. nucipersica*)	Dimers	4.08	19	5.46	0.12	23.52	B	23, 26, 60
		Trimers	1.78	9	0.76	0.68	2.92	A	23, 26
		4-6mers	5.67	9	2.92	2.15	10.17	A	23, 26
		7-10mers	3.30	9	2.28	0.00	6.89	A	23, 26
		Polymers	7.53	9	6.31	0.00	19.08	A	23, 26
09209	Orange juice, chilled, includes from concentrate	Dimers	0.00	3	0.00	0.00	0.00	B	23, 40
09209	Orange juice, chilled, includes from concentrate	Trimers	0.00	1				B	23
		4-6mers	0.00	1				B	23
		7-10mers	0.00	1				B	23
		Polymers	0.00	1				B	23
99673	Oranges, blood, raw (*Citrus sinensis*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
09200	Oranges, raw, all commercial varieties (*Citrus sinensis*)	Dimers	0.00	2		0.00	0.00	B	23, 26
		Trimers	0.00	2		0.00	0.00	B	23, 26
		4-6mers	0.00	2		0.00	0.00	B	23, 26
		7-10mers	0.00	2		0.00	0.00	B	23, 26
		Polymers	0.00	2		0.00	0.00	B	23, 26
09202	Oranges, raw, navels (*Citrus sinensis*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
09241	Peaches, canned, heavy syrup pack, solids and liquids	Dimers	1.24	2		0.00	2.49	C	24, 28
		Trimers	1.22	2		0.00	2.44	C	24, 28
		4-6mers	1.27	2		0.00	2.54	C	24, 28
		7-10mers	0.09	2		0.00	0.17	C	24, 28
		Polymers	0.00	1				B	24
99672	Peaches, canned, heavy syrup, drained liquid	Dimers	2.81	2		2.80	2.83	B	23
		Trimers	0.00	2		0.00	0.00	B	23
		4-6mers	0.00	2		0.00	0.00	B	23
		7-10mers	0.00	2		0.00	0.00	B	23
		Polymers	0.00	2		0.00	0.00	B	23
09370	Peaches, canned, heavy syrup, drained solids	Dimers	0.83	6	0.77	0.29	1.88	B	23, 28
		Trimers	0.17	6	0.15	0.00	0.35	B	23, 28
		4-6mers	0.12	6	0.15	0.00	0.37	B	23, 28
		7-10mers	0.01	3	0.02	0.00	0.03	B	23, 28
		Polymers	0.00	2		0.00	0.00	B	23
09236	Peaches, raw (*Prunus persica*)	Dimers	9.86	22	6.21	3.10	25.20	B	14, 23, 26, 60
		Trimers	4.29	12	1.42	2.74	6.94	A	14, 23, 26
		4-6mers	16.51	9	6.16	7.30	26.25	A	23, 26
		7-10mers	10.07	9	4.35	3.10	17.10	A	23, 26

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NDB No.	Description	Proanthocyanidin	Mean[1]	N	SD	Min	Max	CC	Sources of Data
		Polymers	21.07	9	7.77	12.74	34.54	A	23, 26
97054	Peaches, white, whole, raw (*Prunus perisca*)	Dimers	23.45	10	16.95	4.76	49.57	B	60
09252	Pears, raw (*Pyrus communis*)	Dimers	2.03	18	0.94	0.70	4.33	A	14, 23, 26
		Trimers	1.54	18	0.75	0.43	3.36	A	14, 23, 26
		4-6mers	5.96	12	1.49	3.70	8.96	A	23, 26
		7-10mers	4.69	12	1.77	0.58	8.02	A	23, 26
		Polymers	18.46	12	14.97	0.00	56.33	A	23, 26
97075	Pears, raw, green cultivars, with peel	Dimers	2.73	7	0.44	2.11	3.49	A	23
		Trimers	2.03	7	0.31	1.59	2.61	A	23
		4-6mers	5.99	7	1.13	4.25	7.97	A	23
		7-10mers	5.36	7	1.39	3.64	8.02	A	23
		Polymers	24.16	7	15.28	10.00	56.33	A	23
09413	Pears, raw, red anjou (*Pyrus communis*)	Dimers	2.81	4	1.25	1.55	4.33	B	23
		Trimers	2.29	4	0.92	1.37	3.36	B	23
		4-6mers	6.47	4	1.87	4.66	8.96	B	23
		7-10mers	4.57	4	0.97	3.68	5.91	B	23
		Polymers	13.11	4	11.30	0.97	23.32	B	23
97088	Persimmons, raw , purchased in Spain (*Diospyros kaki*)	Dimers	0.44	3				C	14
		Trimers	0.04	3				C	14
09266	Pineapple, raw, all varieties (*Ananas comosus*)	Dimers	0.00	6	0.00	0.00	0.00	B	14, 23
		Trimers	0.00	6	0.00	0.00	0.00	B	14, 23
		4-6mers	0.00	3	0.00	0.00	0.00	B	23
		7-10mers	0.00	3	0.00	0.00	0.00	B	23
		Polymers	0.00	3	0.00	0.00	0.00	B	23
09430	Pineapple, raw, extra sweet variety (*Ananas comosus*)	Dimers	0.00	7	0.00	0.00	0.00	A	23
		Trimers	0.00	7	0.00	0.00	0.00	A	23
		4-6mers	0.00	7	0.00	0.00	0.00	A	23
		7-10mers	0.00	7	0.00	0.00	0.00	A	23
		Polymers	0.00	7	0.00	0.00	0.00	A	23
97046	Plum, yellow, whole, raw (*Prunus domestica*)	Dimers	27.71	2		26.06	29.36	C	60
97077	Plums, black diamond, with peel, raw (*Prunus spp.*)	Dimers	19.74	2		16.04	23.44	B	23
		Trimers	18.84	2		14.91	22.76	B	23
		4-6mers	57.33	2		49.91	64.74	B	23
		7-10mers	38.04	2		34.89	41.18	B	23
		Polymers	104.96	2		94.58	115.34	B	23
09291	Plums, dried (prunes), uncooked	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
09279	Plums, raw (*Prunus domestica*)	Dimers	33.24	20	16.09	2.70	74.02	B	14, 23, 26, 60
		Trimers	20.65	12	7.32	3.00	31.16	A	14, 23, 26
		4-6mers	52.24	9	20.99	5.80	75.70	A	23, 26
		7-10mers	30.26	9	15.32	2.10	54.48	A	23, 26
		Polymers	60.52	9	24.81	18.37	98.71	A	23, 26
09442	Pomegranate juice, bottled	Trimers	0.00	1				C	40
09286	Pomegranates, raw (*Prunica granatum*)	Dimers	0.29	3				C	14
		Trimers	0.00	3				C	14
09296	Quinces, raw (*Cydonia oblonga*)	Dimers	2.61	3				C	14
		Trimers	1.22	3				C	14
09298	Raisins, seedless (*Vitis vinifera*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
09302	Raspberries, raw (*Rubus occidentalis*)	Dimers	11.78	13	13.46	0.00	40.60	B	14, 23, 26, 35
		Trimers	5.05	11	4.81	0.30	13.92	A	14, 23, 26
		4-6mers	8.99	8	4.99	2.83	15.21	A	23, 26
		7-10mers	1.13	8	1.55	0.00	4.39	A	23, 26
		Polymers	0.00	8	0.00	0.00	0.00	A	23, 26
99671	Raspberries, yellow, raw (*Rubus idaeus L.*)	Dimers	0.00	1				D	35

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NDB No.	Description	Proanthocyanidin	Mean[1]	N	SD	Min	Max	CC	Sources of Data
09307	Rhubarb, raw (*Rheum rhaponticum*)	Dimers	1.70	1				C	26
		Trimers	1.80	1				C	26
		4-6mers	3.40	1				C	26
		7-10mers	1.90	1				C	26
		Polymers	79.00	1				C	26
99675	Rose hips (*Rosa rugosa*)	Dimers	24.20	1				C	26
		Trimers	9.20	1				C	26
		4-6mers	77.70	1				C	26
		7-10mers	12.90	1				C	26
		Polymers	404.00	1				C	26
99335	Rowanberries, raw (*Crataegosorbusmitschurinii*)	Dimers	2.80	2		1.50	4.10	C	26
		Trimers	2.65	2		1.40	3.90	C	26
		4-6mers	5.75	2		3.80	7.70	C	26
		7-10mers	3.15	2		2.50	3.80	C	26
		Polymers	281.00	2		248.00	314.00	C	26
99037	Sea buckthorn berries (*Hippophae rhamnoides*)	Dimers	5.10	1				C	26
		Trimers	3.60	1				C	26
		4-6mers	11.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	24.00	1				C	26
99616	Service (Saskatoon) berries (*Amelanchier alnifolia*)	Dimers	20.20	1				C	26
		Trimers	21.70	1				C	26
		4-6mers	46.10	1				C	26
		7-10mers	21.00	1				C	26
		Polymers	44.60	1				C	26
09316	Strawberries, raw (*Fragaria ananassa*)	Dimers	5.21	16	2.27	0.00	8.70	A	14, 23, 26, 35
		Trimers	5.66	15	2.23	0.50	9.40	A	14, 23, 26
		4-6mers	23.32	12	8.94	10.50	38.95	A	23, 26
		7-10mers	16.86	12	10.83	0.55	28.84	A	23, 26
		Polymers	54.18	12	33.83	3.80	97.81	A	23, 26
97007	Strawberry tree fruit [arbutus], raw (*Fragaria ananassa*)	Dimers	6.60	3	0.00	6.60	6.60	C	14
		Trimers	3.69	3	0.00	3.69	3.69	C	14
09218	Tangerines, (mandarin oranges), raw (*Citrus reticulata*)	Dimers	0.00	2		0.00	0.00	B	24, 26
		Trimers	0.00	2		0.00	0.00	B	24, 26
		4-6mers	0.00	2		0.00	0.00	B	24, 26
		7-10mers	0.00	2		0.00	0.00	B	24, 26
		Polymers	0.00	2		0.00	0.00	B	24, 26
09326	Watermelon, raw (*Citrullus lanatus*)	Dimers	0.00	2		0.00	0.00	B	24, 26
		Trimers	0.00	2		0.00	0.00	B	24, 26
		4-6mers	0.00	2		0.00	0.00	B	24, 26
		7-10mers	0.00	2		0.00	0.00	B	24, 26
		Polymers	0.00	2		0.00	0.00	B	24, 26
11 – Vegetables and Vegetable Products									
11008	Artichokes, (globe or french), cooked, boiled, drained, without salt	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11012	Asparagus, cooked, boiled, drained	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11052	Beans, snap, green, raw (*Phaseolus vulgaris*)	Dimers	0.00	3				C	14
		Trimers	0.00	3				C	14
11080	Beets, raw (*Beta vulgaris*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
11088	Broadbeans, immature seeds, raw (*Vicia faba L.*)	Dimers	91.81	33	33.79	17.89	205.17	B	2, 14
		Trimers	21.73	33	14.37	0.00	78.20	B	2, 14
11097	Broccoli raab, cooked	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24

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NDB No.	Description	Proanthocyanidin	Mean[1]	N	SD	Min	Max	CC	Sources of Data
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11096	Broccoli raab, raw (*Brassica ruvo*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11091	Broccoli, cooked, boiled, drained, without salt	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11090	Broccoli, raw (*Brassica oleracea var. italica*)	Dimers	0.00	2		0.00	0.00	B	24, 26
		Trimers	0.00	2		0.00	0.00	B	24, 26
		4-6mers	0.00	2		0.00	0.00	B	24, 26
		7-10mers	0.00	2		0.00	0.00	B	24, 26
		Polymers	0.00	2		0.00	0.00	B	24, 26
11116	Cabbage, chinese (pak-choi), raw (*Brassica pekinensis*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
11110	Cabbage, cooked, boiled, drained, without salt	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11109	Cabbage, raw (*Brassica oleracea*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
11113	Cabbage, red, cooked, boiled, drained, without salt	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11112	Cabbage, red, raw (*Brassica oleracea (Capitata Group)*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11960	Carrots, baby, raw (*Daucus carota*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11125	Carrots, cooked, boiled, drained, without salt	Dimers	0.00	4	0.00	0.00	0.00	B	23
		Trimers	0.00	4	0.00	0.00	0.00	B	23
		4-6mers	0.00	4	0.00	0.00	0.00	B	23
		7-10mers	0.00	4	0.00	0.00	0.00	B	23
		Polymers	0.00	4	0.00	0.00	0.00	B	23
11124	Carrots, raw (*Daucus carota*)	Dimers	0.00	8	0.00	0.00	0.00	B	14, 23, 26
		Trimers	0.00	8	0.00	0.00	0.00	B	14, 23, 26
		4-6mers	0.00	5	0.00	0.00	0.00	B	23, 26
		7-10mers	0.00	5	0.00	0.00	0.00	B	23, 26
		Polymers	0.00	5	0.00	0.00	0.00	B	23, 26
11135	Cauliflower, raw (*Brassica oleracea*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
11141	Celeriac, raw (*Apium graveolens*)	Dimers	0.00	1				C	26

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NDB No.	Description	Proanthocyanidin	Mean[1]	N	SD	Min	Max	CC	Sources of Data
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
11143	Celery, raw (*Apium graveolens*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11167	Corn, sweet, yellow, raw	Dimers	0.00	1				B	23
		Trimers	0.00	1				B	23
		4-6mers	0.00	1				B	23
		7-10mers	0.00	1				B	23
		Polymers	0.00	1				B	23
11206	Cucumber, peeled, raw	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11205	Cucumber, with peel, raw (*Cucumis sativus*)	Dimers	0.00	2		0.00	0.00	B	24, 26
		Trimers	0.00	2		0.00	0.00	B	24, 26
		4-6mers	0.00	2		0.00	0.00	B	24, 26
		7-10mers	0.00	2		0.00	0.00	B	24, 26
		Polymers	0.00	2		0.00	0.00	B	24, 26
11209	Eggplant, raw (*Solanum melongena*)	Dimers	0.00	4	0.00	0.00	0.00	C	14, 26
		Trimers	0.00	4	0.00	0.00	0.00	C	14, 26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
11215	Garlic, raw (*Allium sativum*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
11226	Jerusalem-artichokes, raw (*Helianthus tuberosus*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
11248	Lentils, sprouted, raw (*Lens culinaris*)	Dimers	1.86	1				D	4
		Trimers	0.00	1				D	4
		4-6mers	0.09	1				D	4
11251	Lettuce, cos or romaine, raw (*Lactuca sativa var. logifolia*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11253	Lettuce, green leaf, raw (*Lactuca sativa var. crispa*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11252	Lettuce, iceberg (includes crisphead types), raw (*Lactuca sativa var. capitata*)	Dimers	0.00	3	0.00	0.00	0.00	B	24, 26
		Trimers	0.00	3	0.00	0.00	0.00	B	24, 26
		4-6mers	0.00	3	0.00	0.00	0.00	B	24, 26
		7-10mers	0.00	3	0.00	0.00	0.00	B	24, 26
		Polymers	0.00	3	0.00	0.00	0.00	B	24, 26
97041	Lettuce, not specified as to type (*Lactuca sativa*)	Dimers	0.00	3				C	14
		Trimers	0.00	3				C	14
11257	Lettuce, red leaf, raw (*Lactuca sativa var. crispa*)	Dimers	0.00	2		0.00	0.00	B	24, 26
		Trimers	0.00	2		0.00	0.00	B	24, 26
		4-6mers	0.00	2		0.00	0.00	B	24, 26
		7-10mers	0.00	2		0.00	0.00	B	24, 26
		Polymers	0.00	2		0.00	0.00	B	24, 26

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NDB No.	Description	Proanthocyanidin	Mean[1]	N	SD	Min	Max	CC	Sources of Data
11283	Onions, cooked, boiled, drained, without salt	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11282	Onions, raw (*Allium cepa*)	Dimers	0.00	5	0.00	0.00	0.00	B	14, 24, 26
		Trimers	0.00	5	0.00	0.00	0.00	B	14, 24, 26
		4-6mers	0.00	2		0.00	0.00	B	24, 26
		7-10mers	0.00	2		0.00	0.00	B	24, 26
		Polymers	0.00	2		0.00	0.00	B	24, 26
99055	Onions, red, raw (*Allium cepa*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
11294	Onions, sweet, raw (*Allium cepa*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11298	Parsnips, raw (*Pastinaca sativa*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
11304	Peas, green, raw (*Pisum sativum*)	Dimers	0.00	3				C	14
		Trimers	0.00	3				C	14
11334	Peppers, sweet, green, cooked, boiled, drained, without salt	Dimers	0.00	4	0.00	0.00	0.00	B	23
		Trimers	0.00	4	0.00	0.00	0.00	B	23
		4-6mers	0.00	4	0.00	0.00	0.00	B	23
		7-10mers	0.00	4	0.00	0.00	0.00	B	23
		Polymers	0.00	4	0.00	0.00	0.00	B	23
11333	Peppers, sweet, green, raw (*Capsicum annuum*)	Dimers	0.00	9	0.00	0.00	0.00	B	14, 23, 26
		Trimers	0.00	9	0.00	0.00	0.00	B	14, 23, 26
		4-6mers	0.00	6	0.00	0.00	0.00	B	23, 26
		7-10mers	0.00	6	0.00	0.00	0.00	B	23, 26
		Polymers	0.00	6	0.00	0.00	0.00	B	23, 26
11823	Peppers, sweet, red, cooked, boiled, drained, without salt	Dimers	0.00	4	0.00	0.00	0.00	B	23
		Trimers	0.00	4	0.00	0.00	0.00	B	23
		4-6mers	0.00	4	0.00	0.00	0.00	B	23
		7-10mers	0.00	4	0.00	0.00	0.00	B	23
		Polymers	0.00	4	0.00	0.00	0.00	B	23
11821	Peppers, sweet, red, raw (*Capsicum annuum*)	Dimers	0.00	8	0.00	0.00	0.00	B	14, 23, 26
		Trimers	0.00	8	0.00	0.00	0.00	B	14, 23, 26
		4-6mers	0.00	5	0.00	0.00	0.00	B	23, 26
		7-10mers	0.00	5	0.00	0.00	0.00	B	23, 26
		Polymers	0.00	5	0.00	0.00	0.00	B	23, 26
11365	Potatoes, boiled, cooked in skin, flesh, without salt (*Solanum tuberosum*)	Dimers	0.00	3	0.00	0.00	0.00	C	26
		Trimers	0.00	3	0.00	0.00	0.00	C	26
		4-6mers	0.00	3	0.00	0.00	0.00	C	26
		7-10mers	0.00	3	0.00	0.00	0.00	C	26
		Polymers	0.00	3	0.00	0.00	0.00	C	26
11367	Potatoes, boiled, cooked without skin, flesh, without salt (*Solanum tuberosum*)	Dimers	0.00	2		0.00	0.00	C	26
		Trimers	0.00	2		0.00	0.00	C	26
		4-6mers	0.00	2		0.00	0.00	C	26
		7-10mers	0.00	2		0.00	0.00	C	26
		Polymers	0.00	2		0.00	0.00	C	26
11358	Potatoes, red, flesh and skin, baked	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11355	Potatoes, red, flesh and skin, raw (*Solanum tuberosum*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24

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NDB No.	Description	Proanthocyanidin	Mean[1]	N	SD	Min	Max	CC	Sources of Data
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11356	Potatoes, Russet, flesh and skin, baked	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11353	Potatoes, russet, flesh and skin, raw (*Solanum tuberosum*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11357	Potatoes, white, flesh and skin, baked	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11354	Potatoes, white, flesh and skin, raw (*Solanum tuberosum*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11429	Radishes, raw (*Raphanus sativus*)	Dimers	0.00	2		0.00	0.00	B	24, 26
		Trimers	0.00	2		0.00	0.00	B	24, 26
		4-6mers	0.00	2		0.00	0.00	B	24, 26
		7-10mers	0.00	2		0.00	0.00	B	24, 26
		Polymers	0.00	2		0.00	0.00	B	24, 26
11435	Rutabagas, raw (*Brassica napus*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
11463	Spinach, frozen, chopped or leaf, unprepared (*Spinacia oleracia*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
11457	Spinach, raw (*Spinacia oleracia*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
11477	Squash, summer, zucchini, includes skin, raw (*Cucurbita pepo*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
11953	Squash, zucchini, baby, raw (*Cucurbita pepo*)	Dimers	0.00	3				C	14
		Trimers	0.00	3				C	14
11508	Sweet potato, cooked, baked in skin, without salt	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11510	Sweet potato, cooked, boiled, without skin	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11507	Sweet potato, raw, unprepared (*Ipomoea batatas*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24

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		Polymers	0.00	1				B	24
11530	Tomatoes, red, ripe, cooked	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
11529	Tomatoes, red, ripe, raw, year round average (*Solanum lycopersicum*)	Dimers	0.00	4	0.00	0.00	0.00	C	14, 26
		Trimers	0.00	4	0.00	0.00	0.00	C	14, 26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
11564	Turnips, raw (*Brassica rapa*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
12 – Nuts and Seeds									
12061	Nuts, almonds (*Prunus dulcis*)	Dimers	9.26	17	3.16	4.00	18.70	A	23, 66
		Trimers	7.63	17	2.71	2.70	14.00	A	23, 66
		4-6mers	27.42	17	12.67	7.00	51.36	A	23, 66
		7-10mers	28.16	17	10.93	9.60	51.98	A	23, 66
		Polymers	80.26	8	28.09	43.86	120.94	A	23
12078	Nuts, brazilnuts, dried, unblanched (*Bertholletia excelsa*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
12087	Nuts, cashew nuts, raw (*Anacardium occidentale*)	Dimers	2.02	7	0.42	1.49	2.55	A	23
		Trimers	0.00	7	0.00	0.00	0.00	A	23
		4-6mers	0.00	7	0.00	0.00	0.00	A	23
		7-10mers	0.00	7	0.00	0.00	0.00	A	23
		Polymers	0.00	7	0.00	0.00	0.00	A	23
12099	Nuts, chestnuts, european, dried, unpeeled (*Castanea sativa*)	Dimers	0.01	3				C	14
		Trimers	0.02	3				C	14
12120	Nuts, hazelnuts or filberts (*Corylus spp.*)	Dimers	12.51	8	3.84	4.43	17.73	A	23
		Trimers	13.56	8	3.93	4.93	17.09	A	23
		4-6mers	67.72	8	20.34	22.78	85.57	A	23
		7-10mers	74.60	8	21.90	26.06	102.69	A	23
		Polymers	322.44	8	102.48	98.10	442.95	A	23
12132	Nuts, macadamia nuts, dry roasted, without salt added	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
12142	Nuts, pecans (*Carya illinoinensis*)	Dimers	42.13	8	5.42	33.74	49.46	A	23
		Trimers	26.03	8	1.98	22.82	28.77	A	23
		4-6mers	101.43	8	10.45	87.44	119.79	A	23
		7-10mers	84.23	8	12.90	65.00	99.54	A	23
		Polymers	223.01	8	59.05	140.58	297.31	A	23
12147	Nuts, pine nuts, dried (*Pinus spp.*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
12151	Nuts, pistachio nuts, raw (*Pistacia vera*)	Dimers	13.26	7	1.80	10.11	15.10	A	23
		Trimers	10.51	7	1.22	8.49	12.00	A	23
		4-6mers	42.24	7	5.23	32.33	47.26	A	23
		7-10mers	37.93	7	4.93	28.36	43.28	A	23
		Polymers	122.46	7	37.10	53.25	158.74	A	23
12155	Nuts, walnuts, english (*Juglans regia*)	Dimers	5.65	8	0.89	4.02	6.63	A	23
		Trimers	7.19	8	1.16	5.04	8.49	A	23
		4-6mers	22.05	8	3.31	16.64	26.14	A	23
		7-10mers	5.41	8	0.81	4.20	6.54	A	23
		Polymers	20.02	8	9.27	5.34	39.43	A	23

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(for mean, standard deviation, min and max, units = mg/100 g, edible portion; blank cells indicate values were not reported)

NDB No.	Description	Proanthocyanidin	Mean[1]	N	SD	Min	Max	CC	Sources of Data
14 - Beverages									
14003	Alcoholic beverage, beer, regular, all	Dimers	0.82	8	0.42	0.08	1.17	B	14, 23, 26, 32, 36
		Trimers	0.16	7	0.07	0.07	0.30	B	14, 23, 26, 36
		4-6mers	0.34	3	0.10	0.21	0.40	B	23, 26
		7-10mers	0.00	3	0.00	0.00	0.00	B	23, 26
		Polymers	0.00	3	0.00	0.00	0.00	B	23, 26
14096	Alcoholic beverage, wine, table, red (*Vitis vinifera*)	Dimers	12.30	270	8.90	0.50	95.10	B	12, 14, 16, 19, 20, 23, 26, 30, 39, 50, 53, 59, 63
		Trimers	2.43	73	2.25	0.17	15.70	B	12, 14, 19, 23, 26, 30, 39, 50, 53
		4-6mers	2.51	57	1.05	0.54	8.60	B	23, 26, 53
		7-10mers	3.77	3	1.95	1.30	5.00	B	23, 26
		Polymers	8.60	3	3.79	3.80	11.00	B	23, 26
14097	Alcoholic Beverage, wine, table, red, Cabernet Sauvignon	Dimers	15.16	34	7.79	1.06	39.32	A	9, 12, 59, 63
		Trimers	2.64	1				C	12
14602	Alcoholic Beverage, wine, table, red, Merlot	Dimers	14.69	14	3.71	4.90	22.66	B	63
14099	Alcoholic Beverage, wine, table, red, Pinot Noir	Dimers	18.33	20	9.89	6.70	53.51	B	63
14108	Alcoholic Beverage, wine, table, red, Sangiovese	Dimers	10.97	4	0.20	10.72	11.21	C	63
14100	Alcoholic Beverage, wine, table, red, Syrah	Dimers	11.41	10	2.03	8.25	15.65	B	63
99439	Alcoholic beverage, wine, table, rosé	Dimers	0.86	3				C	14
		Trimers	0.01	3				C	14
14106	Alcoholic beverage, wine, table, white (*vitis vinifera*)	Dimers	0.28	90	0.06	0.04	0.56	B	5, 14, 51, 53, 59
		Trimers	0.07	49	0.01	0.00	0.11	B	14, 51, 53
		4-6mers	0.04	45	0.00	0.02	0.06	B	53
97002	Alcoholic beverage, wine, white, sherry	Dimers	4.56	3				C	3
14209	Coffee, brewed from grounds, prepared with tap water	Dimers	0.00	5	0.00	0.00	0.00	B	14, 23, 26
		Trimers	0.00	5	0.00	0.00	0.00	B	14, 23, 26
		4-6mers	0.00	2		0.00	0.00	B	23, 26
		7-10mers	0.00	2		0.00	0.00	B	23, 26
		Polymers	0.00	2		0.00	0.00	B	23, 26
97081	Coffee, grounds	Dimers	0.00	3				C	14
		Trimers	0.00	3				C	14
14242	Cranberry juice cocktail, bottled	Dimers	2.08	13	0.33	1.53	2.71	A	21, 23, 41a
		Trimers	3.62	10	0.85	1.59	4.48	A	23, 41a
		4-6mers	6.63	10	1.04	4.58	7.79	A	23, 41a
		7-10mers	2.26	10	0.68	1.73	3.84	A	23, 41a
		Polymers	40.34	10	13.72	8.33	51.86	A	23, 41a
14431	Cranberry juice cocktail, frozen concentrate, prepared with water (*Vaccinium macrocarpon Ait.*)	Dimers	2.23	4	0.53	1.36	2.53	C	21
14317	Malted drink mix, chocolate, powder (*Theobroma cacoa*)	Dimers	20.60	3	11.59	11.70	33.70	C	34
		Trimers	8.77	3	5.24	5.40	14.80	C	34
		4-6mers	12.10	3	9.66	5.60	23.20	C	34
		7-10mers	0.77	3	0.68	0.00	1.30	C	34
14355	Tea, black, brewed	Dimers	2.98	4	1.39	0.70	3.74	C	14, 26
		Trimers	0.37	4	0.02	0.34	0.38	C	14, 26
		4-6mers	0.35	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
14278	Tea, green, brewed	Dimers	2.60	4	0.73	2.21	3.80	C	14, 26
		Trimers	0.70	4	0.30	0.54	1.20	C	14, 26
		4-6mers	0.95	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
16 – Legumes and Legume Products									
16001	Beans, adzuki, mature seeds, raw (*Vigna angularis*)	Dimers	19.40	2				B	23
		Trimers	18.10	2				B	23
		4-6mers	80.00	2				B	23
		7-10mers	75.70	2				B	23
		Polymers	252.90	2				B	23

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NDB No.	Description	Proanthocyanidin	Mean[1]	N	SD	Min	Max	CC	Sources of Data
16014	Beans, black, mature seeds, raw (*Phaseolous vulgaris*)	Dimers	5.20	2				B	23
		Trimers	0.00	2		0.00	0.00	B	23
		4-6mers	0.00	2		0.00	0.00	B	23
		7-10mers	0.00	2		0.00	0.00	B	23
		Polymers	0.00	2		0.00	0.00	B	23
16032	Beans, kidney, red, mature seeds, raw (*Phaseolous vulgaris*)	Dimers	26.40	2				B	23
		Trimers	29.10	2				B	23
		4-6mers	117.70	2				B	23
		7-10mers	105.30	2				B	23
		Polymers	263.40	2				B	23
16037	Beans, navy, mature seeds, raw (*Phaseolus vulgaris*)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
16043	Beans, pinto, mature seeds, cooked, boiled, without salt	Dimers	4.40	4	0.36	3.90	4.70	B	23
		Trimers	3.91	4	0.32	3.44	4.15	B	23
		4-6mers	10.52	4	5.46	4.24	15.19	B	23
		7-10mers	4.32	4	5.48	0.00	11.43	B	23
		Polymers	1.41	4	1.66	0.00	3.23	B	23
16042	Beans, pinto, mature seeds, raw (*Phaseolus vulgaris*)	Dimers	19.22	7	12.69	2.16	34.37	B	14, 23
		Trimers	16.18	7	12.00	0.00	29.81	B	14, 23
		4-6mers	125.90	4	9.21	112.69	132.52	B	23
		7-10mers	135.62	4	10.43	120.64	143.75	B	23
		Polymers	459.63	4	34.15	410.41	489.30	B	23
16049	Beans, white, mature seeds, raw (*Phaseolus vulgaris*)	Dimers	0.03	3	0.00	0.03	0.03	C	14
		Trimers	0.00	3	0.00	0.00	0.00	C	14
16052	Broadbeans (fava beans), mature seeds, raw (*Vicia faba*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
99399	Carob fiber [Caromax] (*Ceratonia siliqua L.*)	Dimers	1.74	3	1.09	1.10	3.00	C	46
		Trimers	8.00	3	8.16	0.43	16.65	C	46
16056	Chickpeas (garbanzo beans, bengal gram), mature seeds, raw (*Cicer arietinum*)	Dimers	0.00	3				C	14
		Trimers	0.00	3				C	14
16062	Cowpeas, common (blackeyes, crowder, southern), mature seeds, raw (*Vigna unguiculata*)	Dimers	18.92	20	8.66	3.52	48.78	B	23, 41
		Trimers	21.58	20	9.07	6.10	55.74	B	23, 41
		4-6mers	47.90	20	14.85	7.30	93.25	B	23, 41
		7-10mers	9.81	20	9.52	0.00	47.28	B	23, 41
		Polymers	32.66	20	13.96	0.00	74.14	B	23, 41
16069	Lentils, raw (*Lens culinaris*)	Dimers	1.20	4	0.29	1.04	1.67	C	4, 14
		Trimers	0.11	4	0.20	0.00	0.44	C	4, 14
		4-6mers	0.03	1				D	4
16098	Peanut butter, smooth style, with salt	Dimers	3.00	3	0.76	2.12	3.50	B	23
		Trimers	8.14	3	3.49	4.14	10.59	B	23
		4-6mers	0.00	3	0.00	0.00	0.00	B	23
		7-10mers	0.00	3	0.00	0.00	0.00	B	23
		Polymers	0.00	3	0.00	0.00	0.00	B	23
16089	Peanuts, all types, oil-roasted, with salt	Dimers	4.07	4	0.70	3.12	4.72	B	23
		Trimers	3.67	4	0.46	3.20	4.20	B	23
		4-6mers	2.77	4	0.20	2.57	2.97	B	23
		7-10mers	0.00	4	0.00	0.00	0.00	B	23
		Polymers	0.00	4	0.00	0.00	0.00	B	23
16087	Peanuts, all types, raw (*Arachis hypogaea*)	Dimers	33.20	1				C	26
		Trimers	48.80	1				C	26
		4-6mers	48.10	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
16085	Peas, green, split, mature seeds, raw (*Pisum sativum*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26

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NDB No.	Description	Proanthocyanidin	Mean[1]	N	SD	Min	Max	CC	Sources of Data
		Polymers	0.00	1				C	26
16108	Soybeans, mature seeds, raw	Dimers	0.00	2		0.00	0.00	B	24, 26
		Trimers	0.00	2		0.00	0.00	B	24, 26
		4-6mers	0.00	2		0.00	0.00	B	24, 26
		7-10mers	0.00	2		0.00	0.00	B	24, 26
		Polymers	0.00	2		0.00	0.00	B	24, 26
19 - Sweets									
19078	Baking chocolate, unsweetened, squares	Dimers	162.84	6	41.64	117.00	217.38	B	22, 23
		Trimers	123.63	6	31.23	98.00	186.00	B	22, 23
		4-6mers	358.40	8	114.68	191.00	563.00	B	22, 23
		7-10mers	240.22	8	84.68	121.00	366.00	B	22, 23
		Polymers	562.75	8	164.85	301.00	830.00	B	22, 23
43201	Bee Pollen	Dimers	0.00	3	0.00	0.00	0.00	C	14
		Trimers	0.00	3	0.00	0.00	0.00	C	14
97034	Cacao beans (*Theobroma cacoa*)	Dimers	831.29	1				C	25
		Trimers	785.70	1				C	25
		4-6mers	2690.78	1				C	25
		7-10mers	2224.21	1				C	25
		Polymers	1568.49	1				C	25
19905	Candies, chocolate, dark, NFS	Dimers	61.04	58	11.26	31.20	128.00	A	11, 22, 23, 26, 34
		Trimers	39.11	58	9.75	21.10	108.00	A	11, 22, 23, 26, 34
		4-6mers	159.73	12	132.53	55.50	454.00	B	22, 23, 26, 34
		7-10mers	93.01	12	92.20	16.30	295.00	B	22, 23, 26, 34
		Polymers	316.24	8	250.30	12.50	697.00	B	22, 23, 26
19120	Candies, milk chocolate	Dimers	22.82	16	3.44	18.00	32.00	B	11, 22, 23, 26
		Trimers	16.04	16	3.44	11.00	23.00	B	11, 22, 23, 26
		4-6mers	51.09	8	11.57	38.00	68.00	B	22, 23, 26
		7-10mers	29.83	8	12.04	8.60	45.42	B	22, 23, 26
		Polymers	55.53	8	43.01	0.00	114.00	B	22, 23, 26
19081	Candies, sweet chocolate	Dimers	2.56	3				C	14
		Trimers	1.38	3				C	14
19165	Cocoa, dry powder, unsweetened	Dimers	277.13	12	131.98	38.20	438.00	B	22, 26, 34, 37
		Trimers	195.73	12	93.67	28.70	360.00	B	22, 26, 34, 37
		4-6mers	419.05	12	336.89	38.40	1094.00	B	22, 26, 34, 37
		7-10mers	925.18	12	875.93	3.10	2110.00	B	22, 26, 34, 37
		Polymers	2435.11	9	1354.96	404.00	4025.00	B	22, 26, 37
19166	Cocoa, dry powder, unsweetened, processed with alkali	Dimers	96.47	17	62.24	12.00	188.00	B	22, 37
		Trimers	29.24	17	28.76	4.00	98.00	B	22, 37
		4-6mers	39.82	17	65.94	1.00	239.00	B	22, 37
		7-10mers	365.53	17	305.39	36.00	1297.00	B	22, 37
		Polymers	720.35	17	575.33	133.00	2465.00	B	22, 37
99403	Jams and preserves, raspberry	Dimers	1.90	1				C	26
		Trimers	1.00	1				C	26
		4-6mers	0.47	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
99064	Jams and preserves, strawberry	Dimers	1.30	1				C	26
		Trimers	0.48	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
20 – Cereal grains and Pasta									
20130	Barley flour or meal	Dimers	15.77	17	3.86	4.70	20.80	B	26, 27
		Trimers	22.02	17	7.35	3.40	29.40	B	26, 27
		4-6mers	5.30	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
99664	Barley malt (*Hordeum vulgare L.*)	Dimers	25.55	39	5.45	16.57	40.35	B	67
		Trimers	24.32	39	4.87	16.55	39.27	B	67
20004	Barley, hulled (*Hordeum vulgare*)	Dimers	33.64	35	11.06	17.55	59.00	B	23, 29, 32, 67
		Trimers	30.56	32	12.95	14.60	67.10	B	23, 29, 67
		4-6mers	27.20	2	0.00	27.20	27.20	B	23
		7-10mers	0.00	2	0.00	0.00	0.00	B	23
		Polymers	0.00	2	0.00	0.00	0.00	B	23

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20008	Buckwheat (*Fagopyrum esculentum Moench*)	Dimers	5.79	8	2.17	3.61	8.57	C	42
		Trimers	1.59	8	0.81	0.72	3.25	C	42
20011	Buckwheat flour, whole-groat (*Fagopyrum esculentum (moench)*)	Dimers	46.51	1				D	49
99668	Buckwheat grits (*Fagopyrum esculentum*)	Dimers	33.90	1				C	26
		Trimers	14.20	1				C	26
		4-6mers	26.50	1				C	26
		7-10mers	7.60	1				C	26
		Polymers	0.00	1				C	26
97031	Buckwheat hulls (*Fagopyrum esculentum (moench)*)	Dimers	43.49	1				D	49
20031	Millet, raw (*Panicum millaceum*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
20033	Oat bran, raw (*Avena sativa*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
20038	Oats (*Avena sativa L.*)	Dimers	0.00	2		0.00	0.00	B	24, 26
		Trimers	0.00	2		0.00	0.00	B	24, 26
		4-6mers	0.00	2		0.00	0.00	B	24, 26
		7-10mers	0.00	2		0.00	0.00	B	24, 26
		Polymers	0.00	2		0.00	0.00	B	24, 26
99685	Rice, black, raw (*Oryza sativa*)	Dimers	2.50	3				C	47
		Trimers	5.20	3				C	47
		4-6mers	15.90	3				C	47
		7-10mers	6.92	3				C	47
20036	Rice, brown, long-grain, raw (*Oryza sativa*)	Dimers	0.00	3				C	47
		Trimers	0.00	3				C	47
		4-6mers	0.00	3				C	47
		7-10mers	0.00	3				C	47
99682	Rice, red, raw (*Oryza sativa L.*)	Dimers	3.37	6	0.52	2.55	4.20	C	38, 47
		Trimers	3.22	6	1.28	1.20	5.25	C	38, 47
		4-6mers	22.89	6	12.51	3.10	42.68	C	38, 47
		7-10mers	20.14	6	11.85	1.40	38.88	C	38, 47
		Polymers	37.41	3				C	38
20044	Rice, white, long-grain, regular, raw, enriched	Dimers	0.00	7	0.00	0.00	0.00	B	24, 26, 47, 48
		Trimers	0.00	7	0.00	0.00	0.00	B	24, 26, 47, 48
		4-6mers	0.00	7	0.00	0.00	0.00	B	24, 26, 47, 48
		7-10mers	0.00	5	0.00	0.00	0.00	B	24, 26, 47
		Polymers	0.00	2		0.00	0.00	B	24, 26
20064	Rye flour, medium (*Secale cerale*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
99674	Rye, bran (*Secale cerale*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
97030	Sorghum bran, Sumac (*Sorghum bicolor*)	Dimers	95.56	5	18.32	77.19	122.09	B	1, 23, 25
		Trimers	123.72	5	17.19	99.20	147.80	B	1, 23, 25
		4-6mers	650.32	5	92.09	531.03	774.79	B	1, 23, 25
		7-10mers	784.19	5	101.42	625.89	904.23	B	1, 23, 25
		Polymers	2927.64	5	335.38	2440.40	3384.67	B	1, 23, 25
20067	Sorghum grain (*Sorghum bicolor*)	Dimers	36.06	4	0.54	35.40	36.72	B	1, 23
		Trimers	46.21	4	0.50	45.60	46.82	B	1, 23
		4-6mers	228.13	4	3.37	224.00	232.25	B	1, 23
		7-10mers	293.78	4	3.74	289.20	298.35	B	1, 23
		Polymers	1346.28	4	31.83	1307.30	1385.26	B	1, 23
99460	Sorghum, grain, white	Dimers	0.00	1				B	23

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		Trimers	0.00	1				B	23
		4-6mers	0.00	1				B	23
		7-10mers	0.00	1				B	23
		Polymers	0.00	1				B	23
97063	Sorghum, hi-tannin, whole grain extrudate (*Sorghum bicolor*)	Dimers	13.25	6	5.61	8.00	23.50	B	1, 23
		Trimers	14.17	6	3.86	10.30	21.20	B	1, 23
		4-6mers	84.61	6	2.40	80.60	88.13	B	1, 23
		7-10mers	127.39	6	28.16	76.10	156.06	B	1, 23
		Polymers	1131.24	6	489.89	238.30	1622.11	B	1, 23
20077	Wheat bran, crude (*Triticum spp.*)	Dimers	0.00	1				C	26
		Trimers	0.00	1				C	26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
20080	Wheat flour, whole-grain	Dimers	0.00	4	0.00	0.00	0.00	C	14, 26
		Trimers	0.00	4	0.00	0.00	0.00	C	14, 26
		4-6mers	0.00	1				C	26
		7-10mers	0.00	1				C	26
		Polymers	0.00	1				C	26
99681	Wheat, not specified to type	Dimers	0.00	1				B	23
		Trimers	0.00	1				B	23
		4-6mers	0.00	1				B	23
		7-10mers	0.00	1				B	23
		Polymers	0.00	1				B	23
99683	Wild rice mix of 3 blends (wild, white and Basmati), dry (*Zizaniae palustris or Zizaniae aquatica*)	Dimers	1.20	2				C	48
		Trimers	1.73	2				C	48
		4-6mers	0.00	2				C	48
99684	Wild rice, quick-cooking, dry (*Zizaniae palustris or Zizaniae aquatica*)	Dimers	1.19	2				C	48
		Trimers	0.00	2				C	48
		4-6mers	0.00	2				C	48
20088	Wild rice, raw (*Zizaniae palustris or Zizaniae aquatica*)	Dimers	2.14	18	0.78	0.00	4.24	B	48
		Trimers	3.29	18	1.83	0.00	6.92	B	48
		4-6mers	5.32	18	2.95	0.00	11.43	B	48
22 - Snacks									
97089	Snacks, tortilla chips, low fat, made with olestra	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
35 – American Indian/Alaska Native Foods									
35193	Agave, cooked (Southwest)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
35194	Agave, dried (Southwest)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
35192	Agave, raw (Southwest)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
35131	Cornmeal, blue (Navajo)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
35132	Melon, banana (Navajo)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24

Table 1. USDA Database for the Proanthocyanidin Content of Selected Foods, Release 2.1 – 2018

(for mean, standard deviation, min and max, units = mg/100 g, edible portion; blank cells indicate values were not reported)

NDB No.	Description	Proanthocyanidin	Mean[1]	N	SD	Min	Max	CC	Sources of Data
		Polymers	0.00	1				B	24
35130	Mush, blue corn with ash (Navajo)	Dimers	0.00	1				B	24
		Trimers	0.00	1				B	24
		4-6mers	0.00	1				B	24
		7-10mers	0.00	1				B	24
		Polymers	0.00	1				B	24
35138	Squash, Indian, raw (Navajo)	Dimers	1.98	1				B	23
		Trimers	1.49	1				B	23
		4-6mers	4.62	1				B	23
		7-10mers	3.19	1				B	23
		Polymers	3.50	1				B	23

Table 2. Foods containing prodelphinidins, propelargonidins and A-Type inkages in addition to Procyanidins and B-Type linkages
(numbers in parentheses denotes Sources of Data)

Fruits	Prodelphinidins	Propelargonidins	A-Type Linkages
Avocado			√ (24)
Bananas	√ (14)		
Bilberry			√ (26)
Blackberries	√ (14)		
Bog whortleberry			√ (26)
Carob	√ (46)		
Cloudberries		√ (26)	
Cranberries			√ (23), (21)
Crowberries			√ (26)
Currants, black	√ (23), (26), (65)		
Currants, red	√ (16), (27), (62)		
Grapes, green	√ (14), (23)		
Grapes, red	√ (23)		
Gooseberries	√ (26), (62)		
Ligonberr			√ (26))
Persimmons	√ (14)		
Plums			√ (23), (60)
Quince	√ (14)		
Raspberry		√ 23), (35)	
Strawberry		√ (23), (35)	
Strawberry tree fruit	√ (14)		
Vegetables			
Broad beans (Fava beans)	√ (14), (2)		
Nuts			
Almonds		√ (23)	
Hazelnuts	√ (23)		
Peanuts, roasted; Peanut butter			√ (23)
Pecans	√ (23)		
Pistachios	√ (23)		
Beverages			
Beer	√ (14), (23), (30), (36)		
Barley, beer	√ (26)		
Cranberry juice cocktail			√ (23)
Grape Juice	√ (23)		
Tea, Black and green	√ (14), (26)		
Wine, red	√ (14), (23)		
Grains			
Barley	√ (27 (30), (67)		

Table 2. Foods containing prodelphinidins, propelargonidins and A-Type inkages in addition to Procyanidins and B-Type linkages
(numbers in parentheses denotes Sources of Data)

Barley flour	√ (26)		
Buckwheat, grain		√ (42)	
Buckwheat, grits		√ (26))	
Lentil	√ (14)		
Pinto beans		√ (23)	
Red beans, small		√ (23)	
Red kidney beans		√ (23)	
Spices			
Cinnamon		√ (23)	√ (23)
Curry powder			√ (23)

Reference List - Proanthocyanidins Database 2018

1. Awika, J.M., Dykes, L., Gu, L., Rooney, L.W., and Prior, R.L.
Processing sorghum (Sorghum bicolor) and sorghum products alters procyanidin oligomer and polymer distribution and content.
J. Agric. Food Chem., 2003, 51(18), 5516-5521.
Sorghum grain (high tannin, sumac), Sorghum bran (sumac), Cocoa, Blueberry.
Procyanidins dimers to decamers, polymers, total procyanidins, catechin monomers.

2. Baginsky, C., Peña-Neira, Á., Cáceres, A., Hernández, T., Estrella, I., Morales, H., and Pertuzé.
Phenoloc compound composition in immature seeds of fava bean (*Vicia faba L.)* varieties cultivated in Chile.
J. Food Comp. Anal., 2013, 31, 1-6.
Varieties of immature fava beans.
Proanthocyanidins, other flavonoids, Total phenols, Total condensed tannins.

3. Baron, R., Mayen, M., Merida, J., and Medina, M.
Changes in phenolic compounds and browning during biological aging of sherry-type wine.
J. Agric. Food Chem., 1997, 45(5), 1682-1685.
Dry pale sherry white wine (in 5 different stages of aging).
Procyanidins B1-B4, Catechin, Epicatechin, Phenolic acids (Gallic, Protocatechuic, Vanillic, Syringic, Caffeic, *p*-Coumaric, Ferulic, Tyrosol, *trans*-Caftaric, *cis*-Coutaric, *trans*-Coutaric, Feftaric).

4. Bartolome, B., Estrella, I., and Hernandez, T.
Changes in phenolic compounds in lentils (Lens culinaris) during germination and fermentation.
Z. Lebensm Unters Forsch A., 1997, 205, 290-294.
Lentils (Lens culinaris): raw, germinated, and fermented
Procyanidins B1-B3, B5, Trimer C1, Tetramers T2-T4, (+)-Catechin, Phenolic acids (Protocatechuic-acid & aldehyde, Gentisic, *p*-Hydroxybenzoic-acid & aldehyde, Vanillic, *p*-Hydroxyphenylpropionic, *p*-Coumaric, Ferulic), Vanillin, Tryptophol.

5. Betes-Saura, C., Andres-Lacueva, C., and Lamuela-Raventos, R.M.
Phenolics in white free run juices and wines from Penedes by high-performance liquid chromatography: Changes during vinification.
J. Agric. Food Chem., 1996, 44(10), 3040-3046.
White free run grape juice & wines (from Penedes).
Procyanidins B2 & B3, Phenolic acids, Benzoic acids, Hydroxycinnamics.

6. Bouayed, J., Dueber, H., Hoffman, L., and Bohn, T.
Bioaccessible and dialyzable polyphenols in selected apple varieties following *in vitro* gigestion vs. their native patterns.
Food Chem., 2012, 131, 1466-1472.

Apples varieties.
Procyanidin B1, B2, other flavonoids, Hydroxycinnamic acids, Dihydrochalcones.

7. Brownmiller, C., Howard, L.R., and Prior, R.L.
Processing and storage effects on procyanidin composition and concentration of processed blueberry products.
J. Agric. Food Chem., 2009, 57, 1896-1902.
Blueberries: blanched, frozen, canned in water and syrup.
Procyanidins dimers to octamers, catechin monomers.

8. Burda, S., Oleszek, W., and Lee, C.Y.
Phenolic compounds and their changes in apples during maturation and cold storage.
J. Agric. Food Chem., 1990, 38, 945-948.
Apples (Golden delicious, Empire, Rhode Island Greening).
Procyanidin B2, Epicatechin, Quercetin glycosides, Phloretin xylogalactoside, Phloretin glucoside, Chlorogenic acid.

9. Cáceras, A., Peña-Neira, Á., Galvez, A., Obreque-Slier, E., López-Solís, R., and Canals, J.M.
Phenolic composition of grapes and wines from cultivar Cabernet Sauvignon produced in Chile and their relationship to commercial value.
J. Agric. Food Chem., 2012, 60, 8694-8702.
Grapes: Cabernet Sauvognon.
Procyanidin B1, B2, B3, B4, Catechin, Epicatechin, Total phenols, Total tannins, Total anthocyanins.

10. Ceymann, M., Arrigoni, E., Schärer, H., Bozzi, A., and Hurrell, R.F.
Identification of apples rich in health-promoting flava-3-ols and phenolic acids by measuring the polyphenol profile.
J. Food Comp. Anal., 2012, 26, 128-135.
Apple varieties.
Procyanidins B1, B2, other flavonoids, phenolic acids, Total phenols.

11. Cooper, K.A., Campos-Giménez, E., Alvarez, D.J., Rytz, A., Nagy, K., and Williamson, G.
Predictive relationship between polyphenol and nonfat cocoa solids content of chocolate.
J. Agric. Food Chem., 2008, 56, 260-265.
Chocolates: dark and milk.
Procyanidin dimers B2, B5, trimer C1, Tetramer D; Total polyphenols.

12. de Freitas, V.A.P., Glories, Y., and Monique, A.
Developmental changes of procyanidins in grapes of red *Vitis vinifera* varieties and their composition in respective wines.
Am. J. Enol. Vitic., 2000, 51(4), 397-403.
Wine-Merlot and Cabernet Sauvignon.

Procyanidins dimers: B1-B8, Trimer C1, Total dimers + C1, Total dimers + catechins, (+)-Catechin, (-)-Epicatechin, (-)-Epicatechin gallate.

13. de Freitas, V.A.P., Glories, Y.
Concentration and compositional changes of procyanidins in grape seeds and skin of white *Vitis vinifera* varieties.
J. Sci. Food Agric., 1999, 79, 1601-1606.
Grape seeds and skins of white grapes.
Procyanidin dimers B1 to B8, Trimer C1, Catechin, Epicatechin, Epicatechin gallate.

14. de Pascual-Teresa, S., Santos-Buelga, C., and Rivas-Gonzalo, J.C.
Quantitative analysis of flavan-3-ols in Spanish foodstuffs and beverages.
J. Agric. Food Chem., 2000, 48, 5331-5337.
Apple (Golden), Apple (Granny Smith), Apple Renette, Apple (Red Delicious), Apricot, Avocado, Banana, Blackberry, Blueberry, Cherry, Chestnut, Custard apple, Early fig, Grape (red), Grape (white), Kiwi, Medlar, Peach, Pear (Blanquilla), Pear (Conferencia), Persimmon, Pineapple, Plum, Pomegranate, Quince, Raspberry, Redcurrent, Strawberry, Strawberry tree fruit, Aubergine, Broad bean, Carrot, Courgette, Lettuce, Onion, Pea, Pepper (red), Pepper (green), Tomato, Chickpea, French bean, Lentil, Pinto bean, White bean, Cider, Coffee, Soluble cacao, Tea (black), Tea (green), Wine (red), Wine (rose), Wine (white), Beer, Bee pollen, Chocolate, Wheat flour.
Procyanidins B1-B5, B7, C1, Gallocatechin, Catechin, Epigallocatechin, Epicatechin, Epigallocatechin gallate, Epicatechin-3O-gallate.

15. Dragovic-Uzelac, V., Levaj, B., Mrkic, V., Bursac, D., and Boras, M.
The content of polyphenols and carotenoids in three apricot cultivars depending on stage of maturity and geographical region.
Food Chem., 2007, 102, 966-975.
Apricots: 3 cltivars.
Procyanidin B1, B2, B3, other flavonols, Phenolic acids.

16. Fanzone, M., Peña-Neira, Á., Jofré, V., Assof, M., and Zamora, F.
Phenolic characterization of Malbec wines from Mendoza province (Argentina).
J. Agric. Food Chem., 2010, 58, 2388-2397.
Wines, Malbec.
Procyanidins B1, B3 and Catechin, Epicatechin, Anthocyanins, Hydroxybenzoic acids, Hydroxycinnamic acids, Flavanonols, Flavonols.

17. Fuleki, T. and Ricardo da Silva, J.M.
Effects of cultivar and processing method on the contents of catechins and procyanidins in grape juice.
J. Agric. Food Chem., 2003, 57, 640-646.
Grape juice.
Procyanidin dimers B1, B2, B3, B4 and their gallates, Trimers C1, C2, T2.

18. Fuleki, T. and Ricardo da Silva, J.M.
Catechin and procyanidin composition of seeds from grape cultivars grown in Ontario.
J. Agric. Food Chem., 1997, 45, 1156-1160.
Grape seeds-Red and white (cultivars: Vinifera, Hybrid, and Labrusca).
Procyanidins B1-B4, C1, T2, B1-3-O-g, B2-3-O-g, Total procyanidin dimers and trimers, (+)-Catehin, (-)-Epicatehin, Total catechins.

19. Ghiselli, A., Nardini, M., Baldi, A., and Scaccini, C.
Antioxidant activity of different phenolic fractions separated from an Italian red wine.
J. Agric. Food Chem., 1998, 46(2), 361-367.
Italian red wine.
Procyanidins B1, B2, B3, B6, Free anthocyanins (Delphinidin, Cyanidin, Petunidin, & Malvidin glucosides), Flavonols (Quercetin, Myricetin, & Kaempferol glucosides), Hydroxycinnamoyltartaric acids, Phenolic acids.

20. Gomez-Plaza, E., Gil-Munoz, R., Lopez-Roca, J.M., and Martinez, A.
Color and phenolic compounds of a young red wine as discriminating variables of its aging status.
Food Res. Internat., 1999, 32, 503-507.
Red wine (var. Monastrell).
Procyanidins B2, B4, B5, Caftaric acid, Coutaric acid, Catechin, Epicatehin, Anthocyanins (as malvidin-3-glucoside)-Delphinidin, Petunidin, Peonidin, Malvidin.

21. Grace, M.H., Massey, A.R., Mbeunkui, F., Yousef, G.G., and Lila, M.A.
Comparison of health-relevant flavonoids in commonly consumed cranberry products.
J. Food Sci., 2012, 77, H176-H183.
Cranberry juice, Cranberry sauce, Sweetened dried cranberries.
Procyanidin dimers A2.

22. Gu, L., House, S.E., Wu, X., Ou, B., and Prior, R.L.
Procyanidin and catechin content and antioxidany capacity of cocoa and chocolate products.
J. Agric. Food Chem., 2006, 54, 4057-4061.
Cocoa powders: natural, Dutched, Chocolates: milk, dark, unsweetened, baking chips.
Procyanidins: dimers to polymers, Catechin, Epicatechin.

23. Gu, L., Kelm, M.A., Hammerstone, J.F., Beecher, G., Holden, J., Haytowitz, D., Gebhardt, S., and Prior, R.L.
Concentrations of proanthocyanidins in common foods and estimations of normal consumption.
J. Nutr., 2004, 134(3), 613-617.
Fruits, vegetables, nuts, grains, beverages, snacks, spices, baby foods.
Procyanidins (monomers, dimers to decamers, polymers), Total procyanidins.

24. Gu, L., Kelm, M.A., Hammerstone, J.F., Beecher, G., Holden, J., Haytowitz, D., Gebhardt, S., and Prior, R.L.
Screening foods containing proanthocyanidins and their structural characterization using LC-MS/MS and thiolytic degradation.
J. Agric. Food Chem., 2003, 51, 7513-7521.
Foods without any proanthocyanidins.

25. Gu, L., Kelm, M., Hammerstone, J.F., Beecher, G., Cunningham, D., Vannozzi, S., and Prior, R.L.
Fractionation of polymeric procyanidins from lowbush blueberry and quantification of procyanidins in selected foods with an optimized normal-phase HPLC-MS fluorescent detection method.
J. Agric. Food Chem., 2002, 50, 4852-4860.
Blueberries (lowbush), Brown sorghum bran, Cocoa, Cranberries.
Procyanidins (monomers, dimers to decamers, polymers), Total procyanidins.

26. Hellström, Törrönen, A.R., and Matilla, P.H.
Proanthocyanidins in common food products of plant origin.
J. Agric. Food Chem. 2009, 57, 7899-7906.
Fruits and berries, Vegetables and roots, Cereal products, soybeans, peas, broad beans, Coffee beverage.
Procyanidins: dimers to polymers, monomers.

27. Holtekjølen, A.K., Kinitz, C., and Knutsen, S.H.
Flavanol and bound phenolic acid contents in different barley varieties.
J. Agric. Food Chem., 2006, 54, 2253-2260.
Barley: 16 varieties.
Procyanidins: Dimers, trimers, Catechins.

28. Hong, Y-J., Barret, D.M., and Mitchell, A.E.
Liquid chromatography/Mass spectrometry investigation of the impact of thermal processing and storage on peach procyanidins.
J. Agric. Food Chem., 2004, 52, 2366-2371.
Peaches: frozen, canned with syrup, canned drained.
Procyanidins: dimers to octamers.

29. Jerumanis, J.
Quantitative analysis of flavanoids in barley, hops, and beer by high-performance liquid chromatography (HPLC).
J. Inst. Brew., July-August 1985, 91, 250-252.
Barley, Hops.
Procyanidins B3 & C2, Prodelphinidin B3 & trimers (B, D, & E), (+)-Catechin.

30. Kovac, V., Alonso, E., Bourzeix, M., and Revilla, E.
Effect of several enological practices on the content of catechins and proanthocyanidins of red wines.
J. Agric. Food Chem., 1992, 40(10), 1953-1957.
Red wines (cv. Vranac).
Procyanidins B1-B4, C1, (+)-Catechin, (-)-Epicatechin, Total catechins and procyanidins.

31. Lee, K.W., Kim, Y.J., Kim, D-O., Lee, H.J., and lee C.Y.
Major phenolics in apple and their contribution to the total antioxidant capacity.
J. Agric. Food Chem., 2003, 57, 6516-6520.
Apples – Golden delicious, Cortland, Monroe, Rhode Island Greening, Empire, NY674.
Procyanidins: dimer B2, Epicatechin, Quercetin, Chlorogenic acid.

32. Madigan D. and McMurrough I.,
Determination of proanthocyanidins and catechins in beer and barley by high-performance liquid chromatography with dual-electrode electrochemical detection.
Analyst, 1994, 194(5), 863-868.
Beer (stabilized).
prodelphinidin B3, Procyanidin B3, (+)-Catechin, (-)-Epicatechin.

33. Mangas, J.J., Suarez, B., Picinelli, A., Moreno, J., and Blanco, D.
Differentiation by phenolic profile of apple juices prepared according to two membrane techniques.
J. Agric. Food Chem., 1997, 45(12), 4777-4784.
Apple juice (from cider apples).
Procyanidins B1 & B2, (-)-Epicatechin, Chlorogenic acid, Phloretin glucoside (phloridzin), Phloretin xyloglucoside, Unknown polyphenol.

34. Masterfoods, Inc., Hackettstown, New Jersey, Unpublished data.
Dark chocolates, Cocoa powders.
Procyanidins – dimers to decamers.

35. Määttä-Riihinen, K. R., Kamal-Eldin, A., and Torronen, A.R.
Identification and classification of phenolic compounds in berries of Fragaria and Rubus species (family Rosaceae).
J. Agric. Food Chem., 2004, 52, 6178-6187.
Strawberries (Jonsok), Raspberries (Muskoka, yellow cultivated, red wild), Arctic bramble (Mespi, Pima), Cloudberries.
Proanthocyanidins: dimer B2, Catechin, Epicatechin, Other flavonoids, Phenolic acids.

36. McMurrough, I. and Madigan, D.
Semipreparative chromatographic procedure for the isolation of dimeric and trimeric proanthocyanidins from barley.
J. Agric. Food Chem., 1996, 44(7), 1731-1735.
Beer.

Procyanidins B3 & T4, Prodelphinidins B3, T1-T3, Total dimers and trimers, (+)-Catechin, (-)-Epicatechin, Total monomers, Total flavonols.

37. Miller, K.B., Hurst, W.J., Payne, M.J., Stuart, D.A., Apgar, J., Sweigart, D.S., and Ou, B.
Impact of alkalizationon the antioxidant and flavanol content of commercial cocoa powders.
J. Agric. Food Chem., 2008, 56, 8527-8533.
Cocoa powders: natural, different degrees of alkalization.
Procyandins: Dimers to polymers.

38. Min, B., Gu, L., McClung, A.M., Bergman, C.J., and Chen, M-H.
Free and bound total phenolic concentrations, antioxidant capacities, and profiles of proanthocyanidins and anthocyanins in whole grain rice (*Oryza sativa* L.) of different bran colours.
Food Chem., 2012, 133, 715-722.
Rice, medium grain with red bran.
Monomers, dimers, trimmers, tetramers, pentamers, hexamers, heptamers, octomers, nonamers, decamers, polymers, total and DPPH, ORAC, ICC (Iron Chelating apacity), total phenolics, total flavonoids.

39. Monogas, M., Gómez-Cardovés, C., Bartolomé, B., Laureano, O., and Da Silva, J.M.R.
Monomeric, oligomeric, and polymeric flavan-3-ol composition of wines and grapes from *Vitis vinifera* L. Cv. Graciano, Tempranillo, and Cabernet Sauvignon.
J. Agric. Food Chem., 2003, 51, 6475-6481.
Wines, grape seeds, grape skins:Graciano, Temoranillo, Cabernet Sauvignon.
Procyanidins: dimers B1, B2, B3, B4, dimer gallates, trimer C1, Catechin, Epicatechin, Epicatechin-3-gallate.

40. **Mullen, W., Marks, S., and Crozier, A.**
Evaluation of phenolic compounds in commercial fruit juices and fruit drinks.
J. Agric. Food Chem., 2007, 55, 3148-3157.
Fruit juices: Cranberry, purple grape, red grape, pomegranate, apple, grapefruit, orange, tropical.
Procyanidins: dimer B1, Trimer, Other flavonoids.

41a. Ocean Spray
Unpublished data. 2016.
Cranberry products
Proanthocyanidins (dimers –polymers

41. Ojwang, L.O., Yang, L., Dykes, L., and Awika, J.
Proanthocyanidin profile of cowpea (*Vigna ungiculata*) reveals catechin-*O*-glucoside as the dominant compound.
Food Chem., 2013, 139, 35-43.

Cowpea cultivars (light brown, golden brown, red and black seed coats).
Proanthocyanidins (dimers –polymers), flavan 3-ol monomers.

42. Ölschläger, C., Regos, I., Zeller, F.J., and Treutter, D.T.
Identification of galloylated propelargonidins and procyanidins in buckwheat grain and quantification of rutin, and flavanols from homostylous hybrids originating from *F. esculentum* x *F. homotropicum.*
Phytochemistry, 2008, 69, 1389-1397.
Buckwheat.
Procyanidins: dimers B2, b5, trimers, Catechin, Epicatechin, Epicatechin gallate.

43. Oszmianski, J, Wolniak, M., Wojdylo A., and Wawer, I.
Comparative study of polyphenolic content and antiradical activity of cloudy and clear apple juices.
J. Sci. Food Agric., 2007, 87, 573-579.
Apple juice.
Procyanidins: dimers B1, B2, trimer, Quercetin.

44. Oszmianski, J. and Lee, Y.
Isolation and HPLC determination of phenolic compounds in red grapes.
Am. J. Enol. Vitic., 1990, 41(3), 204-206.
Red grapes (Concord & de Chaunac).
Procyanidin B3, Epicatechin, Rutin, Quercetin galactoside and glucoside, *trans*-Caffeoyl, *cis*-Caffeoyl, *trans*-Coumaroyl, *cis*-Coumaroyl.

45. Panzella, L., Petriccione, M., Rega, P., Scortichini, M., and Napolitano, A.
A reappraisal of traditional apple cultivars from Southern Italy as a rich source of phenols with superior antioxidant activity.
Food Chem., 2013, 140, 672-679.
Apple cultivars from Sothern Italy.
Procyanidin dimers, Catechin, Epicatechin, Phloridzin, Dihydrochalcones.

46. Papagianopoulos, M., Wollseifen, H.R., Mellenthin, A., Haber, B., and Galensa, R.
Identification and quantification of polyphenols in carob fruits (*Ceratonia siliqua* L.) and derived products by HPLC-UV-ESI/MS^n.
J. Agric. Food Chem., 2004, 52, 3784-3791.
Carob kibbles, Locust bean, Carob syrup.
Procyanidin dimers, other flavonoids, Phenolic acids.

47. Pereira-Caro, G., Cros, G., Yokota, T., and Crozier, A. Phytochemical profiles of black, red, brown, and white rice from the Camarque region of France.
J. Agric. Food Chem., 2013, 61, 7976-7986.
Rice – black, red, brown and white.

Flavanols (catechin and proanthocyanidin dimers-decamers), flavones, flavomols, carotenoids.

48. Qiu, Y., Liu, Q., and Beta, T.
Antioxidant activity of commercial wild rice and identification of flavonoids compounds in active fractions.
J. Agric. Food Chem., 2009, 57, 7543-7551.
Wild rice (11 varieties), white rice.
Procyanidins (dimers –pentamers), monomers.

49. Quettier-Deleu, C., Gressier, B., Vasseur, J., Dine, T., Brunet, C., Luyckx, M., Cazin, M., Cazin, J.-C., Bailleul, F., and Trotin, F.
Phenolic compounds and antioxidant activities of buckwheat (*Fagopyrum esculentum* Moench) hulls and flour.
Journal of Ethnopharmacology, 2000, 72, 35-42.
Buckwheat flour, Hulls (var. 'La Harpe')
Procyanidin B2 & B2-3-O-gallate, (-)-Epicatechin, (-)-Epicatechin gallate, Rutin, Quercetin, Hyperoside.

50. Ricardo da Silva, J.M., Rosec, J-Ph., Bourziex, M., Mourgues, J., & Moutounet, M.
Dimer and trimer procyanidins in Carignan and Mourvedre grapes and red wines.
Vitis, 1992, 31, 55-63.
Grapes & Wine-red (Carignan and Mourvedre).
Procyanidins B1-B4, C1, T2, B1-3-O-gallate, B2-3-O-gallate, B2-3'-O-gallate.

51. Ricardo da Silva, J.M., Cheynier, V., Samsom, A., and Bourziex, M.
Effect of pomace contact, carbonic maceration, and hyperoxidation on the procyanidin composition of Grenache Blanc wines.
Am. J. Enol. Vitic., 1993, 44(2), 168-172.
Wine (from Grenache Blanc grapes).
Procyanidins B1-B4, C1, T2, B1-3-O-gallate, B2-3-O-gallate, B2-3'-O-gallate.

52. Ruiz, D., Egea, J., Gil, M., and Tomás-Barberán, F.A.
Characterization and quantitation of phenolic compounds in new apricot (*Prunus armeniaca* L.) varieties.
J. Agric. Food Chem., 2005, 53, 9544-9552.
Apricot varieties.
Procyanidin dimers B1, B2, B4, Trimers 1, 2, other procyanidins, Chlorogenic acid, Other flavonoids.

53. Sánchez-Moreno, C., Cao, G., Ou, B, and Prior, R. L.

Anthocyanin and proanthocyanin content in selected white and red wines. Oxygen radical absorbance capacity comparison with nontraditional wines obtained from highbush blueberry.
J. Agric. Food Chem., 2003, 51, 4889-4896.
Red wines, white wines.
Procyanidins dimers, trimers, tetramers, Catechins, Anthocyanins, ORAC.

54. Schieber, A., Keller, P., and Carle, R.
Determination of phenolic acids and flavonoids of apple and pear by high-performance liquid chromatography.
J. Chrom. A., 2001, 910, 265-273.
Apple and pear juice (apple juice from Jonagold & Elstar varieties; pear juice from Alexander Lucas, Anjou, & Red Williams varieties).
Procyanidins B1 & B2, Catechin, Epicatechin, Quercetin & Quercetin glycosides, 5-HMF, *p*-Coumaroyl glucose, Chlorogenic acid, *p*-Coumaroyl quinic acid, Caffeic acid, *p*-Coumaric acid, Phloridzin, Phloretin.

55. Spanos, G.A. and Wrolstad, R.E.
Influence of variety, maturity, processing, and storage on the phenolic composition of pear juice.
J. Agric. Food Chem., 1990(a), 38, 817-824.
Pear juice (from Comice, d'Anjou, and Bartlett varieties).
Procyanidins B1-B4, Total procyanidins, Catechin, Epicatechin, Cinnamics (oxidized), Arbutin, Rutin, Quercetin galactoside, Isorhamnetin glycosides, Total flavonols, Total phenolics.

56. Spanos, G.A. and Wrolstad, R.E.
Influence of processing and storage on the phenolic composition of Thompson seedless grape juice.
J. Agric. Food Chem., 1990(b), 38(7), 1565-1571.
Grape juice (from Thompson seedless grapes).
Procyanidins B1-B4, Trimer + Tetramer, Total procyanidins, Catechin, Epicatechin, Total unknowns.

57. Spanos, G.A., Wrolstad, R.E., and Heatherbell, D.A.
Influence of processing and storage on the phenolic composition of apple juice.
J. Agric. Food Chem., 1990(c), 38(7), 1572-1579.
Apple juice (from Granny Smith, Red delicious, McIntosh, & Spartan variety).
Procyanidins B1-B4, Total procyanidins, Catechin, Epicatechin, Quercetin glycosides & totals, Phloretin glycosides & totals, Cinnamics.

58. Suarez-Valles, B., Sanatamaria-Victorero, J., Mangas Alonso, J.J., and Blanco-Gomis, D.
High-performance liquid chromatography of the neutral phenolic compounds of low molecular weight in apple juice.
J. Agric. Food Chem., 1994, 42, 2732-2736.

Apple juice (N Senora, San Pedro, & San Juan varieties).
Procyanidins B1, B2, C1 + tetramer, Unknown procyanidin, Catechin, Epicatechin, Phloretin xyloglucoside, Rutin, Isoquercetin + Hyperin, Unknown flavonol, Avicularin, Phloridzin, Quercetrin.

59. Teissedre, P.L. and Landrault, T.
Wine phenolics: contribution to intake and bioavailability.
Food Res. Int., 2000, 33(6), 461-467.
Wine (commercial)-Red & White (Merlot, Cabernet-Sauvignon, Grenache, Syrah, Egiodola, & Chardonnay).
Procyanidins B1-B4, Catechin, Epicatechin, Malvidine-3-glucoside, Total phenols, Gallic acid, Caffeic acid, Para-hydroxycoumaric acid, Caftaric acid, Protocatechuic acid.

60. Tomas-Barberan, F.A., Gil, M.I., Cremin, P., Waterhouse, A.L., Hess-Pierce, B., and Kader, A.A.
HPLC-DAD-ESIMS analysis of phenolic compounds in nectarines, peaches, and plums.
J. Agric. Food Chem., 2001, 49, 4748-4760.
Nectarines (white & yellow flesh), Peaches (white & yellow flesh), Plums (red & yellow).
Procyanidins (B1 & others for nectarines and peaches; B1, B2, B4, A-type dimers, & others for plums), Catechin, Epicatechin, Quercetin glycosides, Cyanidin glycosides, Hydrocinnamic acid derivatives, Totals.

61. Tsao, R., Yang, R., Young, C., and Zhu, H.
Polyphenolic profiles in eight apple cultivars using high-performance liquid chromatography (HPLC).
J. Agric. Food Chem., 2003, 51, 6347-6353.
Apples (Empire, McIntosh, Cortland, Red Delicious, Northen Spy, Golden Delicious, Ida Red).
Procyanidin dimers B1, B2, Quercetin,.

62. Valvanidis, A., Vlachogianni, T., Psomas, A., Zovoili, A., and Siatis, V.
Polyphenolic profile and antioxidant activity of five apple cultivars grown under organic and conventional agricultural practices.
Int. J. Food Sci. Technol., 2009, 44, 1167-1175.
Apples – Red Delicious Starking, Golden Delicious, Granny Smith, Royal Gala, Jona Gold.
Procyanidins B1, B2S, Catechin, Epicatechin, Cyanidin, Quercetin, Chlorogenic acid, DPPH, ABTS, FRAP.

63. Van Leeuw, R., Kevers, C., Pincemail, J., Defraigne, J. O., and Dommes, J.
Antioxidant capacity and phenolic composition of red wines from various grape varieties: Specificity of Pinot Noir.
J. Food Comp. Anal., 2014, 36, 40-50.

Red wines: Merlot, Syrah, Cabernet Sauvignon, Pinot Noir, San Giovese, Neto d'Avola, Malbec, Primitivo.
Proanthocyanidins B1, B2, Catechin, Epicatechin, Phenolic acids, Flavonols, Anthocyanidins, Resveratrol, ORAC, DPPH, Total phenolics.

64. Vrhovsek, U., Rigo, A., Tonon, D., and Mattivi, F.
Quantitation of polyphenols in different apple varieties.
J. Agric. Food Chem., 2004, 52, 6532-6538.
Apples – Renetta, Red Delicious, Granny Smith, Morgenduft, Golden Delicious, Royal Gala,Braeburn, Fuji.
Procyanidins B2, Oligomers,Catechin, Epicatechin, Cyanidin, Quercetin, Total polyphenols, Hydroxycinnamates (5'-caffeoyl, p_Comaroylquinic, p-Coumaric acids), Dihydrochacones (Phloridzin, Phloretin).

65. Wu, X., Gu, L., Prior, R. L., and McKay, S.
Characterization of anthocyanins and proanthocyanidins in some cultivars of *Ribes*, *Aronis*, and *Sambucus* and their antioxidant capacity.
J. Agric. Food Chem., 2004, 52, 7846-7856.
Black Currants (cv. Ben Alder, Ben Navis, Ben, Lomond, Ben Tirran, Titania, Ukraine), Gooseberries (cv. Winham, Lancashire, Dan's Mistake, Careless), Chokeberries, Elderberries, Red Currants.
Procyanidin dimers, Trimers, 4-6mers, 7-10mers, >10mers, Cyanidin, Delphinidin, Pelargonidin, Peonidin, Petunidin, Total Phenolics, ORAC.

66. Xie, L., Roto, A.V., and Bolling, B.W.
Characterization of ellagitannins, gallotannins, and bound proanthocyanidins from California almond (*Prunus dulci*) varieties.
J. Agric. Food Chem., 2012, 60, 12151-12156.
Almonds (Nonperiel, Butte, Carmel)
Dimers, trimers 4-6mers, 7-10mers.

67. Zimmermann, B. and Galensa, R.
One for all-all for one: proof of authenticity and tracing of foods with flavonoids. Analysis of proanthocyanidins in barley and malt.
Eur Food Res Technol, 2007, 224:385-393.
Barley cultivars, Barley malt.
Procyanidins C2, B3, Prodelphinidin B3, C2.