

USDA Database for the Choline Content of Common Foods¹

Prepared by

Juliette C. Howe, Juhi R. Williams, and Joanne M. Holden

Nutrient Data Laboratory
Agricultural Research Service
U.S. Department of Agriculture

in collaboration with

Steven H. Zeisel and Mei-Heng Mar

Department of Nutrition, University of North Carolina, Chapel Hill, NC 27599

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U.S. Department of Agriculture
Agricultural Research Service
Beltsville Human Nutrition Research Center
Nutrient Data Laboratory
10300 Baltimore Avenue
Building 005, Room 107, BARC – West
Beltsville, Maryland 20705
Tel. 301-504-0630,
E-mail: ndlinfo@rbhnrc.usda.gov
Web site: <http://www.nal.usda.gov/fnic/foodcomp>

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Documentation: USDA Database for the Choline Content of Common Foods

Introduction

Research has shown that choline is important for the synthesis of phospholipids in cell membranes, methyl metabolism, acetylcholine synthesis and cholinergic neurotransmission in humans (1). Betaine, a choline derivative is also important because of its role in the donation of methyl groups to homocysteine to form methionine (2). Zeisel et al, have shown that healthy men fed a choline deficient diet, with normal folate and vitamin B₁₂ intake, became choline depleted and developed liver steatosis and liver damage that resolved when a source of dietary choline was provided (3). Folate and choline are metabolically interrelated (1). Diminished folate availability increases demand for choline as a methyl donor while decreased choline availability increases demand for folate methyl groups (4).

A 1999 NIH sponsored workshop on trimethylaminuria estimated that as much as one percent of the U.S. population may suffer from a genetic defect in the flavin-containing monooxygenase 3 gene, FM03. This defect leads to the development of a fishy body odor because of an accumulation of trimethylamine (5-7). To diminish body odor, a choline-restricted diet could be beneficial for this group of people.

The Food and Nutrition Board of the Institute of Medicine has made recommendations for choline intake, estimating an Adequate Intake (AI) at 550 mg per day for men and 425 mg per day for women. However, little data is available on the choline content of foods from which dietary intake levels could be calculated. Therefore, a USDA Special Interest database for choline in foods has been developed to provide researchers and consumers with the means to estimate choline intake from common foods. The collaborators for the database are the Nutrient Data Laboratory (NDL), Agricultural Research Service, US Department of Agriculture, Beltsville, MD and University of North Carolina at Chapel Hill, NC.

Methods and procedures for generating the table

The samples for the project were obtained nationally from 12-24 retail outlets in accordance with the nationwide sampling plan developed for the National Food and Nutrient Analysis Program (8). Approximately 15% of the analyses were based on samples picked-up locally (Chapel Hill, NC). Food items were analyzed as purchased (raw/fresh) or were cooked according to package directions.

To estimate choline levels in retail ground beef, a nationwide (24 outlets) sampling of ground beef products at each of the three fat levels (<12% fat, 12-22% fat, or >22% fat) was conducted. Ground beef samples within each geographical region were combined into regional composites for each fat level (n=12). Raw and cooked (broiled patties) samples from each region and fat level were analyzed for choline. Results from these analyses were used to generate regression equations for each choline metabolite in both raw and broiled ground beef. The regression equations were then used to estimate choline values for beef products varying in fat content from 5%-30%.

Choline compounds were extracted and partitioned into organic and aqueous phases using methanol and chloroform and analyzed directly by liquid chromatography -

electrospray ionization -isotope dilution mass spectrometry (LC-ESI-IDMS) (9). The chemical structure of the choline metabolites are shown in Fig 1. Quality assurance was monitored through the use of duplicate sampling, in-house control materials (mouse liver, beef baby food), and a standard reference material, which provides an information value for choline (National Institute of Standards and Technology, Standard Reference Material 1546, Meat Homogenate). Samples were analyzed for betaine and these choline-contributing compounds: free choline (Cho), glycerophosphocholine (GPC), phosphocholine (Pcho), phosphatidylcholine (Ptdcho), and sphingomyelin (SM).

The analytical data for Betaine, Cho, GPC, Pcho, PtdCho, and SM are presented individually in the database since these choline sources may differ as to their bioavailability (10). When choline is taken-up by most tissues, it is either converted to betaine and then used as an osmolyte and methyl donor, or it is phosphorylated and then used for the synthesis of phospholipids (Fig. 2). Because there are metabolic pathways for the interconversion of Cho, GPC, Pcho, PtdCho, and SM (1), total choline content is calculated as the sum of these choline-contributing metabolites. These individual metabolites are reported in the database as mg choline moiety per 100g of food. Betaine values are not included in the calculation of total choline since the conversion of choline to betaine is irreversible (11). Betaine values are reported as the mg of betaine/100g food. A zero value reported in the database is a true zero; samples were analyzed, but the compound (betaine, choline, etc.) was not detected.

Data Evaluation

The Nutrient Data Laboratory has redesigned the software of the USDA Nutrient Data Bank System (NDBS) to provide a system for data acquisition, compilation, and dissemination. As part of the new NDBS, scientists at NDL developed a new procedure to facilitate the evaluation of analytical data, based on criteria described earlier by Holden, et al., (12) and Mangels, et al. (13). Values in the choline database were evaluated for quality and reliability using this new procedure. In brief, five categories of information are evaluated: the sampling plan, sample handling, number of samples analyzed, analytical method, and analytical quality control. The evaluation rating for sampling plan examines how representative the procured food samples are with respect to relevant factors such as food type, brand, cultivar, geographic origin, and/or market share. Evaluation of the number of samples analyzed is critical to the estimation of the mean as well as the magnitude of variability for a component in a food. Sample handling criteria evaluate whether the food has been processed and handled properly to assure general nutrient stability of the food matrix, nutrient content and representativeness of the sample. The evaluation process for the analytical method focuses on the validity of the analytical method (sample preparation, analysis and quantification method) and the day-to-day quality control of the method by the laboratory (accuracy and precision). Analytical quality control evaluates the accuracy and precision demonstrated by the laboratory as each food was analyzed.

Criteria are established within each category with an assignation of points to each criterion; points are totaled within each category (20 points per category). The ratings for each category are summed to yield a Quality Index (QI) – the maximum score is 100 points. The confidence code (CC), an indicator of the relative quality of the data and the

reliability of a given mean, is derived from the QI and designated as A, B, C, or D (A being the best). The CC are assigned as follows:

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

A more complete description of the procedure for determining CC has been previously reported (14). Total choline values, along with confidence codes, are presented in the table. The CC shown in the choline database refers only to the total choline values, not to the individual metabolites.

Format of the table

The table contains choline and betaine values for 434 foods across 22 food categories. The food items are arranged by food category. Each food item is identified by a unique NDB number, a five digit numerical code used in the USDA Nutrient Database for Standard Reference (SR). Foods in the choline database, which do not have corresponding entries in SR, are designated by “98___” in the NDB column. These temporary NDB numbers are not unique to these foods and may be re-used in future special interest databases produced by NDL.

The fields are as follows:

Field	Description
NDB No.	USDA Nutrient Data Bank number
Description	Food item description
Betaine	Betaine
Free Cho	Free Choline
GPC	Glycerophosphocholine
Pcho	Phosphocholine
PtdCho	Phosphatidylcholine
SM	Sphingomyelin
Total Cho	Total Choline
N	Number of samples analyzed
CC	Confidence code

Data Dissemination

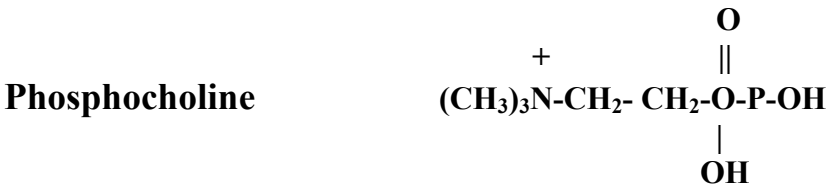
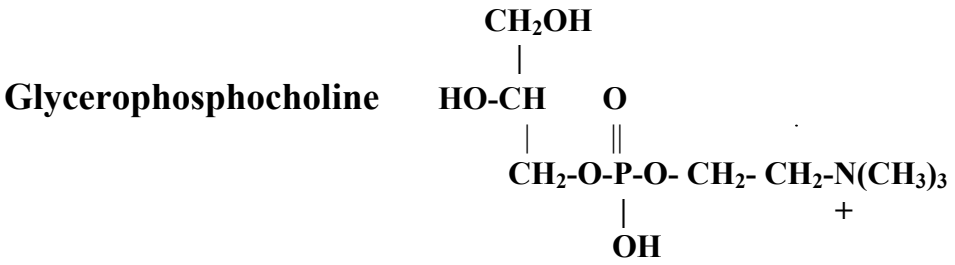
The USDA Database for the Choline Content of Common Foods is presented as a PDF file. Adobe Acrobat Reader® is needed to view the report of the database. A compressed file (flav.zip) containing the complete database in the ASCII format and its documentation has also been prepared and is available for downloading from this web site (<http://nal.usda.gov/fnic/foodcomp>). The user can download the database, free of charge, onto his/her own computer for use with other programs.

References Cited in the documentation

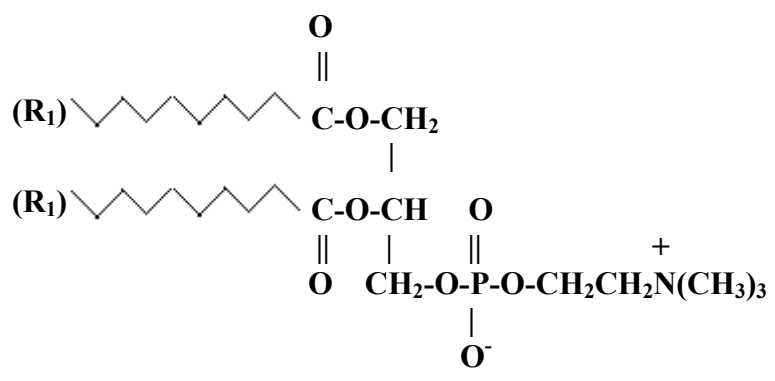
1. Zeisel, S. H., and Blusztajn, J. K. (1994) Choline and human nutrition. *Ann. Rev. Nutr.* 14, 269-296
2. Finkelstein, J. D., Harris, B. J., and Kyle, W. E. (1972) Methionine metabolism in mammals: kinetic study of betaine-homocysteine methyltransferase. *Arch. Biochem. Biophys.* 153, 320-324
3. Zeisel, S. H., daCosta, K.-A., Franklin, P. D., Alexander, E. A., Lamont, J. T., Sheard, N. F., and Beiser, A. (1991) Choline, an essential nutrient for humans. *FASEB J.* 5, 2093-2098
4. Kim, Y.-I., Miller, J. W., da Costa, K.-A., Nadeau, M., Smith, D., Selhub, J., Zeisel, S. H., and Mason, J. B. (1995) Folate deficiency causes secondary depletion of choline and phosphocholine in liver. *J. Nutr.* 124, 2197-2203
5. Al-Waiz, M., Ayesh, R., Mitchell, S. C., Idle, J. R., and Smith, R. L. (1988) Trimethylaminuria ('fish-odour syndrome'): a study of an affected family. *Clin. Sci.* 74, 231-236
6. Al-Waiz, M., Ayesh, R., Mitchell, S. C., Idle, J. R., and Smith, R. L. (1989) Trimethylaminuria: the detection of carriers using a trimethylamine load test. *J. Inher. Metab. Dis.* 12, 80-85
7. Mitchell, S. C., and Smith, R. L. (2001) Trimethylaminuria: the fish malodor syndrome. *Drug Metab. Dispos.* 29, 517-521
8. Pehrsson, P.R., Haytowitz, D.B., Holden, J.M., Perry, C.R., and Beckler, D.G. (2000) USDA's National Food and Nutrient Analysis Program: Food Sampling. *J. Food Comp. Anal.* 13, 379-389
9. Koc, H., Mar, M. H., Ranasinghe, A., Swenberg, J. A., and Zeisel, S. H. (2002) Quantitation of choline and its metabolites in tissues and foods by liquid chromatography/electrospray ionization-isotope dilution mass spectrometry. *Anal. Chem.* 74, 4734-4740
10. Cheng, W.-L., Holmes-McNary, M. Q., Mar, M.-H., Lien, E. L., and Zeisel, S. H. (1996) Bioavailability of choline and choline esters from milk in rat pups. *J. Nutr. Biochem.* 7, 457-464
11. Zeisel, S.H., Mar, M.H., Howe, J. C., Holden, J. M. (2003) Concentrations of choline – containing compounds and betaine in common foods. *J. Nutr.* 133, 1302-1307; Erratum (2003) *J. Nutr.* 133, 2918-2919
12. Holden, J.M., Bhagwat, S.A, and Patterson, K.Y. (2002) Development of a multi- nutrient data quality system. *J. Food Comp. Anal.* 15, 339-348
13. Mangels, A. R., Holden, J.M., Beecher, G. R., Forman, M. R., and Lanza E. (1993). Carotenoid content of fruits and vegetables: an evaluation of analytic data. *J. Am. Diet Assoc.* 93, 284-296
14. Holden, J. M. Eldridge, A. L., Beecher, G. R., Buzzard, I. M. Bhagwat, Davis, C.S., Douglass, L. W., Gebhardt, S.E., Haytowitz, D.B., and Schakel, S. (1999) Carotenoid content of U.S. Foods: An update of the database. *J. Food Comp. Anal.* 12, 169-196

Acknowledgement

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Phosphatidylcholine



Sphingomyelin

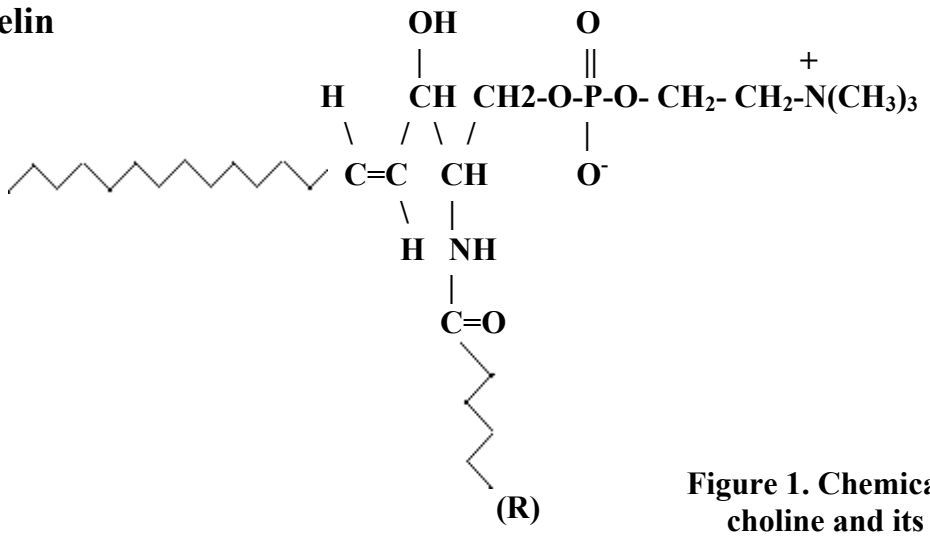


Figure 1. Chemical structures of choline and its metabolites

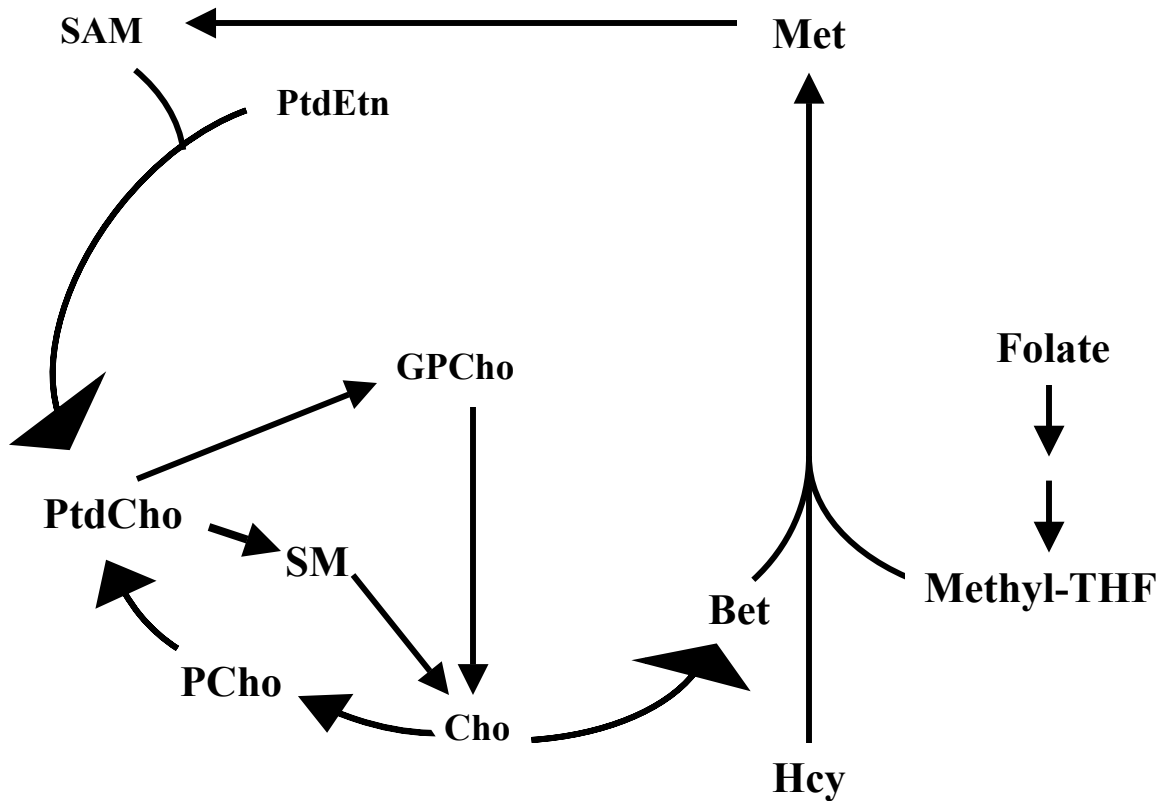


Figure 2. Metabolic Pathway for choline and betaine compounds. Phosphocholine (Pcho), phosphatidylcholine (PtdCho), glycerophosphocholine (GPC), and sphingomyelin (SM) are formed from choline (Cho) and can be hydrolyzed to form Cho. The formation of betaine (Bet) from Cho is irreversible. Betaine can donate a methyl group to homocysteine (Hcy) to form methionine (Met). Met is converted to S-adenosylmethionine (SAM), which is an important methyl donor. PtdCho can be formed from SAM and phosphatidylethanolamine (Ptd Etn). Folate and Cho metabolism intersect because methyltetrahydrofolate (Methyl-THF), a product of folate metabolism, can also donate a methyl group for the formation of Met from Hcy.

USDA Database for the Choline Content of Common Foods

NDB No ¹	Description	Betaine ²	Free Cho ²	GPC ²	Pcho ²	PtdCho ²	SM ²	Total Cho ³	N	CC ⁴
		mg/100g of food	mg choline moiety / 100 g of food							
Dairy and Eggs										
01001	Butter, with salt	0.3	0.5	1.2	0.7	11.0	5.4	18.8	1	B
01009	Cheese, cheddar	0.7	1.6	2.3	0.6	7.4	4.6	16.5	1	B
01012	Cheese, cottage, creamed, large or small curd	0.7	3.6	8.4	1.3	2.5	2.5	18.3	1	B
01015	Cheese, cottage, lowfat, 2% milk fat	0.6	2.9	8.1	1.3	2.0	2.0	16.3	1	B
01014	Cheese, cottage, nonfat, uncreamed, dry, large or small curd	0.9	3.7	9.2	1.6	1.6	1.8	17.9	1	B
01017	Cheese, cream	0.7	3.6	9.3	1.5	7.3	5.6	27.3	1	B
01046	Cheese food, pasteurized process, american, without di sodium phosphate	1.4	7.9	14.4	2.1	7.1	4.6	36.1	1	B
01029	Cheese, mozzarella, part skim milk, low moisture	0.7	2.3	2.7	0.9	5.2	3.0	14.1	1	B
01040	Cheese, swiss	0.6	4.5	0.6	0.0	6.3	4.2	15.6	1	B
01049	Cream, fluid, half and half	0.7	3.9	9.0	1.1	2.6	2.1	18.7	1	B
01199	Cream, half and half, fat free	0.7	4.0	8.0	1.2	0.8	1.0	15.0	1	B
01056	Cream, sour, cultured	0.6	3.9	7.6	1.2	3.7	2.7	19.1	2	B
01069	Cream substitute, powdered	0.1	0.5	1.4	0.0	0.0	0.3	2.2	3	B
01124	Egg, white, raw, fresh	0.3	0.2	0.6	0.0	0.3	0.0	1.1	4	A
01128	Egg, whole, cooked, fried	0.7	0.7	0.6	0.6	253.7	17.0	272.6	4	A
01129	Egg, whole, cooked, hard-boiled	0.6	0.7	0.5	0.5	209.9	13.6	225.2	4	A
01123	Egg, whole, raw, fresh	0.6	0.6	0.6	0.6	238.5	10.7	251.0	15	A
01125	Egg, yolk, raw, fresh	0.9	1.3	0.9	1.0	634.1	45.1	682.4	4	A
01103	Milk, chocolate, fluid, commercial, reduced fat	0.7	5.4	8.2	1.1	1.7	0.7	17.1	1	B
01082	Milk, lowfat, fluid, 1% milkfat, with added vitamin A	0.6	4.0	9.8	1.9	1.2	0.7	17.6	1	B
01085	Milk, nonfat, fluid, with added vitamin A (fat free or skim)	1.9	2.8	9.7	1.7	0.7	0.7	15.6	1	B
01079	Milk, reduced fat, fluid, 2% milkfat, with added vitamin A	0.9	2.8	10.0	1.6	1.1	0.9	16.4	2	B
01077	Milk, whole, 3.25% milkfat	0.6	3.7	7.5	1.8	0.6	0.6	14.2	1	B
01121	Yogurt, fruit, low fat, 10 grams protein per 8 ounce	0.8	2.1	7.8	1.6	1.5	1.1	14.1	2	B
43261	Yogurt, fruit variety, nonfat	0.7	3.3	7.8	2.0	1.9	1.4	16.4	1	B
01117	Yogurt, plain, low fat, 12 grams protein per 8 ounce	0.9	2.3	9.1	1.7	1.0	1.1	15.2	2	B
Spices and Herbs										
02044	Basil, fresh	0.4	8.0	0.6	2.0	0.8	0.0	11.4	1	B
02003	Spices, basil, dried	16.1	50.0	1.3	0.0	3.2	0.4	54.9	1	B

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		mg/100g of food	mg choline moiety / 100 g of food							
02009	Spices, chili powder	2.7	49.3	1.0	2.2	14.0	0.0	66.5	1	B
02010	Spices, cinnamon, ground	3.9	7.0	0.9	0.8	2.4	0.0	11.1	1	B
02011	Spices, cloves, ground	1.4	28.7	1.0	1.0	6.8	0.0	37.5	1	B
02015	Spices, curry powder	28.8	41.8	1.1	1.4	19.9	0.0	64.2	1	B
02020	Spices, garlic powder	6.1	41.5	17.7	1.3	7.0	0.0	67.5	1	B
02021	Spices, ginger, ground	3.4	32.8	1.3	0.9	6.2	0.0	41.2	1	B
02024	Spices, mustard seed, yellow	1.9	46.2	0.9	0.4	75.1	0.0	122.6	1	B
02026	Spices, onion powder	0.4	25.1	4.4	1.6	7.8	0.0	38.9	1	B
02027	Spices, oregano, dried	9.8	28.3	1.6	0.0	2.1	0.2	32.2	1	B
02028	Spices, paprika	7.1	34.3	2.0	3.8	11.4	0.0	51.5	1	B
02029	Spices, parsley, dried	1.7	16.7	1.5	6.6	72.3	0.0	97.1	1	B
02030	Spices, pepper, black	8.9	9.4	0.3	0.3	1.2	0.0	11.2	2	B
02033	Spices, poppy seed	0.9	7.2	1.0	0.0	0.6	0.0	8.8	1	B
02043	Spices, turmeric, ground	9.7	21.4	2.3	3.2	22.3	0.0	49.2	1	B
Fats and oils										
04053	Oil, olive, salad or cooking	0.1	0.0	0.3	0.0	0.0	0.0	0.3	1	B
04114	Salad dressing, italian dressing, commercial, regular	0.0	1.5	1.0	0.0	0.1	0.1	2.7	1	B
04636	Salad dressing, italian dressing, fat-free	1.8	1.5	1.4	0.2	0.5	0.4	4.0	1	B
98001	Salad dressing, italian, regular with egg	0.0	1.6	2.9	0.0	7.4	0.4	12.3	1	B
04027	Salad dressing, mayonnaise, imitation, soybean	0.3	0.3	1.1	0.0	12.6	0.6	14.6	1	B
04025	Salad dressing, mayonnaise, soybean oil, with salt	0.0	0.2	0.0	0.0	45.8	0.0	46.0	1	B
04638	Salad dressing, ranch dressing, fat-free	0.3	1.6	1.8	0.5	0.0	0.0	3.9	1	B
Chickens and Turkey										
05009	Chicken, broilers or fryers, meat and skin, cooked, roasted	5.6	5.3	1.2	3.4	44.5	11.5	65.9	1	B
05006	Chicken, broilers or fryers, meat and skin, raw	7.8	6.0	1.0	3.6	40.6	8.5	59.7	1	B
05011	Chicken, broilers or fryers, meat only, raw	8.5	5.8	1.1	3.5	44.5	10.7	65.6	1	B
05013	Chicken, broilers or fryers, meat only, roasted	5.7	5.7	1.1	3.7	53.7	14.5	78.7	1	B
05661	Chicken, liver, all classes, cooked, pan-fried	23.3	69.1	5.4	6.1	213.4	14.5	308.5	4	A
05028	Chicken, liver, all classes, cooked, simmered	12.8	47.9	8.8	4.9	213.7	14.8	290.1	4	A
05027	Chicken, liver, all classes, raw	16.9	49.2	15.7	4.1	120.8	4.7	194.5	4	A
98002	Chicken, wings, frozen, barbecue flavored, glazed,	13.5	4.0	1.5	1.7	54.8	15.1	77.1	1	B

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		mg/100g of food	mg choline moiety / 100 g of food							
	conventional									
98004	Chicken, wings, frozen, barbecue flavored, glazed, microwaved	16.8	5.7	1.4	1.5	51.7	14.0	74.3	2	B
98003	Chicken, wings, frozen, barbecue flavored, glazed, raw	12.7	4.6	1.4	1.6	48.1	14.1	69.8	1	B
05174	Turkey, gizzard, all classes, cooked, simmered	1.8	9.5	3.1	3.6	40.8	25.3	82.3	1	B
05173	Turkey, gizzard, all classes, raw	1.9	41.2	0.3	5.0	24.4	18.8	89.7	1	B
05176	Turkey, heart, all classes, cooked, simmered	3.1	3.9	1.4	3.4	142.2	21.6	172.5	1	B
05175	Turkey, heart, all classes, raw	3.3	24.6	0.9	3.7	83.5	14.1	126.8	1	B
05178	Turkey, liver, all classes, cooked, simmered	2.4	9.7	13.2	2.9	168.9	25.5	220.2	1	B
05177	Turkey, liver, all classes, raw	3.0	63.8	16.8	2.1	122.8	16.4	221.9	1	B
	Soups, sauces and gravies									
06164	Sauce, ready-to-serve, salsa	0.2	7.3	1.0	1.3	2.0	0.0	11.6	1	B
06931	Sauce, pasta, spaghetti/marinara, ready-to-serve	0.6	8.5	0.8	2.0	2.4	0.0	13.7	2	B
06019	Soup, chicken noodle, canned, condensed, commercial	11.9	3.3	0.9	0.4	5.9	0.8	11.3	2	B
06159	Soup, tomato, canned, condensed, commercial	4.2	6.1	0.9	1.1	4.3	0.4	12.8	1	B
	Sausages and luncheon meats									
07956	Beef sausage, fresh, cooked	10.4	0.5	2.6	0.9	41.3	6.2	51.5	1	B
07954	Beef sausage, pre-cooked	7.3	3.3	1.9	1.0	30.5	6.0	42.7	1	B
07007	Bologna, beef	5.0	18.3	0.8	1.5	21.3	4.3	46.2	2	B
07960	Bologna, chicken, pork	4.4	37.3	0.6	2.4	23.3	4.1	67.7	1	B
07959	Bologna, chicken, pork, beef	4.2	23.5	1.0	2.9	26.5	5.2	59.1	3	A
07952	Bologna, chicken, turkey, pork	4.8	23.1	0.5	2.0	23.3	4.4	53.3	2	B
07022	Frankfurter, beef	5.3	4.1	1.6	1.0	27.1	3.3	37.1	2	B
07945	Frankfurter, beef, heated	5.5	4.3	1.7	1.1	28.9	3.3	39.3	2	B
07024	Frankfurter, chicken	5.1	6.2	0.9	1.7	35.2	7.3	51.3	4	B
07950	Frankfurter, meat	3.6	6.7	1.4	1.5	29.8	4.9	44.3	3	A
07949	Frankfurter, meat, heated	3.5	5.9	1.1	1.4	29.1	5.5	43.0	2	B
07957	Pork and turkey sausage, pre-cooked	2.2	6.7	1.7	1.0	24.7	5.1	39.2	1	B
07064	Pork sausage, fresh, cooked	3.6	7.0	9.3	0.5	43.1	6.9	66.8	5	A
07953	Pork sausage, pre-cooked	3.1	5.5	5.4	0.7	33.8	6.9	52.3	3	A
07063	Pork sausage, fresh, raw	3.4	8.0	8.7	0.5	29.6	6.2	53.0	4	A

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		mg/100g of food	mg choline moiety / 100 g of food							
07075	Sausage, smoked link sausage, pork and beef	2.1	22.8	0.8	0.9	21.5	4.7	50.7	1	B
07958	Turkey sausage, fresh, cooked	8.0	2.0	1.1	1.5	48.3	10.4	63.3	1	B
07955	Turkey sausage, fresh, raw	6.4	2.7	1.3	1.2	38.6	6.7	50.5	1	B
Breakfast cereals										
08105	Cereals, CREAM OF WHEAT, quick, cooked with water, without salt	6.9	1.6	0.7	0.0	1.2	0.0	3.5	1	B
08121	Cereals, oats, regular and quick and instant, unenriched, cooked with water, without salt	3.1	1.2	1.6	0.0	4.5	0.0	7.3	1	B
08013	Cereals ready-to-eat, GENERAL MILLS, CHEERIOS	34.7	4.4	10.4	0.0	11.4	0.0	26.2	1	B
08077	Cereals ready-to-eat, GENERAL MILLS, Whole Grain TOTAL	168.0	5.8	0.7	0.9	11.6	0.0	19.0	1	B
08001	Cereals ready-to-eat, KELLOGG, KELLOGG'S ALL-BRAN Original	360.0	25.5	4.3	1.7	17.9	0.0	49.4	1	B
08014	Cereals ready-to-eat, KELLOGG, KELLOGG'S COCOA KRISPIES	1.3	4.2	3.6	0.0	0.9	0.0	8.7	1	B
08020	Cereals ready-to-eat, KELLOGG, KELLOGG'S Corn Flakes	0.7	1.4	2.1	0.0	0.5	0.0	4.0	1	B
08030	Cereals ready-to-eat, KELLOGG, KELLOGG'S FROOT LOOPS	32.6	1.8	3.0	0.5	5.2	0.0	10.5	1	B
08065	Cereals ready-to-eat, KELLOGG, KELLOGG'S RICE KRISPIES	0.5	2.2	5.1	0.0	1.2	0.0	8.5	1	B
08337	Cereals ready-to-eat, KRAFT, POST Raisin Bran Cereal	290.7	12.2	5.0	0.8	10.5	0.0	28.5	1	B
08340	Cereals ready-to-eat, KRAFT, POST THE ORIGINAL SHREDDED WHEAT Cereal	158.0	5.5	3.2	0.9	13.5	0.0	23.1	1	B
08012	Cereals ready-to-eat, QUAKER, CAP'N CRUNCH'S PEANUT BUTTER CRUNCH	1.8	7.1	1.7	0.7	5.2	0.0	14.7	1	B
08218	Cereals ready-to-eat, QUAKER, QUAKER 100% Natural Cereal with oats, honey, and raisins	135.2	8.3	10.6	2.0	10.8	0.0	31.7	1	B
08435	Cereals ready-to-eat, UNCLE SAM CEREAL	248.4	12.4	7.1	0.5	29.4	0.0	49.4	1	B
08084	Cereals ready-to-eat, wheat germ, toasted, plain	1396.1	69.2	33.8	4.2	44.9	0.0	152.1	1	B
Fruits and fruit products										
09003	Apples, raw, with skin	0.1	0.3	0.0	0.0	3.1	0.0	3.4	1	B
98005	Apple juice, calcium enriched with added vitamin C	0.1	0.7	0.7	0.0	0.4	0.0	1.8	1	B

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09032	Apricots, dried, sulfured, uncooked	0.3	7.1	0.8	0.0	6.0	0.0	13.9	1	B
09038	Avocados, raw, California	0.7	8.6	0.7	2.5	2.2	0.1	14.1	2	B
09040	Bananas, raw	0.1	3.2	5.6	0.5	0.4	0.0	9.7	1	B
09042	Blackberries, raw	0.3	1.8	0.8	0.0	6.0	0.0	8.6	1	B
09050	Blueberries, raw	0.2	3.0	0.6	0.7	1.8	0.0	6.1	1	B
98008	Clementines, raw	0.1	11.0	0.5	0.3	2.0	0.2	14.0	1	B
09078	Cranberries, raw	0.2	1.3	1.0	0.5	2.6	0.0	5.4	1	B
09087	Dates, deglet noor	0.4	6.1	0.0	0.1	0.1	0.0	6.3	2	B
09421	Dates, medjool	0.4	8.9	0.0	0.0	0.8	0.2	9.9	1	B
09094	Figs, dried, uncooked	0.7	12.8	0.4	0.1	2.6	0.0	15.9	2	B
09112	Grapefruit, raw, pink and red, all areas	0.1	3.6	1.2	0.3	2.5	0.0	7.6	2	B
09135	Grape juice, canned or bottled, unsweetened, without added vitamin C	0.2	3.0	0.0	0.0	0.2	0.0	3.2	1	B
09132	Grapes, red or green (european type varieties, such as, Thompson seedless), raw	0.1	4.8	0.0	0.6	0.2	0.0	5.6	2	B
09148	Kiwi fruit, (chinese gooseberries), fresh, raw	0.5	2.6	1.0	0.5	3.6	0.0	7.7	2	B
09159	Limes, raw	0.2	1.1	0.9	0.6	2.5	0.0	5.1	1	B
09181	Melons, cantaloupe, raw	0.1	4.1	0.7	1.1	1.6	0.0	7.5	1	B
09191	Nectarines, raw	0.2	1.7	1.2	0.6	2.7	0.0	6.2	1	B
09209	Orange juice, chilled, includes from concentrate	0.2	2.0	1.3	0.2	2.6	0.0	6.1	1	B
98006	Orange juice from concentrate with added vitamin C	0.1	2.3	2.5	0.5	1.8	0.0	7.1	1	B
09214	Orange juice, frozen concentrate, unsweetened, undiluted	0.5	8.1	4.2	0.6	7.0	0.0	19.9	1	B
09202	Oranges, raw, navels	0.1	4.7	1.1	0.5	2.1	0.0	8.4	2	B
98007	Peaches, canned, heavy syrup, drained, liquid	0.3	0.5	1.0	0.5	0.4	0.2	2.6	1	B
09370	Peaches, canned, heavy syrup, drained, solids	0.3	0.4	0.9	0.5	1.8	0.2	3.8	1	B
09236	Peaches, raw	0.3	0.8	1.1	0.5	3.7	0.0	6.1	1	B
09257	Pears, canned, heavy syrup pack, solids and liquids	0.3	0.6	1.0	0.0	0.3	0.0	1.9	1	B
09252	Pears, raw	0.2	2.2	0.2	0.0	2.7	0.0	5.1	3	B
09430	Pineapple, raw, extra sweet variety	0.1	4.2	0.0	0.4	0.8	0.0	5.4	1	B
09429	Pineapple, raw, traditional varieties	0.1	5.1	0.0	0.5	0.1	0.0	5.7	1	B
09291	Plums, dried (prunes), uncooked	0.4	6.7	0.9	0.0	2.5	0.0	10.1	2	B
09298	Raisins, seedless	0.3	9.4	0.3	1.1	0.3	0.0	11.1	2	B
09302	Raspberries, raw	0.8	3.1	1.6	0.6	7.0	0.0	12.3	1	B

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09316	Strawberries, raw	0.2	0.6	0.9	0.0	4.2	0.0	5.7	1	B
09218	Tangerines, (mandarin oranges), raw	0.1	5.2	1.0	0.6	3.5	0.0	10.3	1	B
09326	Watermelon, raw	0.3	3.1	0.0	0.7	0.2	0.1	4.1	1	B
Pork products										
10864	Pork, bacon, rendered fat, cooked	0.2	0.2	0.0	0.0	5.4	1.0	6.6	1	B
10860	Pork, cured, bacon, cooked, baked	3.4	12.3	13.5	2.5	81.7	9.3	119.3	4	A
10861	Pork, cured, bacon, cooked, microwaved	3.0	11.6	11.4	2.5	88.5	10.7	124.7	4	A
10862	Pork, cured, bacon, cooked, pan-fried	4.2	12.3	18.7	3.0	86.7	10.1	130.8	4	A
10123	Pork, cured, bacon, raw	0.9	4.4	4.6	1.4	32.4	3.9	46.7	4	A
10041	Pork, fresh, loin, center loin (chops), bone-in, separable lean only, cooked, braised	1.9	1.6	20.6	1.1	66.1	6.4	95.8	4	A
10042	Pork, fresh, loin, center loin (chops), bone-in, separable lean only, cooked, broiled	1.6	2.2	22.5	1.2	70.5	6.4	102.8	4	A
10858	Pork, fresh, loin, top loin (chops), boneless, separable lean only, cooked, pan-broiled	2.4	1.7	21.2	1.2	68.1	6.4	98.6	4	A
10066	Pork, fresh, loin, top loin (chops), boneless, separable lean only, raw	2.4	1.6	23.6	1.2	49.0	4.7	80.1	4	A
10007	Pork, fresh, separable fat, cooked	2.6	2.1	25.9	1.3	30.0	5.0	64.3	1	B
Vegetables and vegetable products										
98009	Agave, cooked	0.4	5.2	0.7	0.0	2.8	0.1	8.8	1	B
11001	Alfalfa seeds, sprouted, raw	0.4	11.0	0.6	1.8	1.0	0.0	14.4	1	B
11008	Artichokes, (globe or french), cooked, boiled, drained, without salt	0.2	4.2	1.1	13.0	16.1	0.0	34.4	1	B
98010	Artichokes, microwaved	0.4	6.4	0.0	1.1	14.8	0.0	22.3	1	B
11012	Asparagus, cooked, boiled, drained	0.9	6.6	0.9	3.5	15.1	0.0	26.1	1	B
11011	Asparagus, raw	0.6	12.2	0.6	2.4	0.9	0.0	16.1	1	B
11061	Beans, snap, green, frozen, cooked, boiled, drained without salt	0.1	4.0	0.8	1.4	7.3	0.0	13.5	1	B
11084	Beets, canned, drained solids	177.1	0.2	0.7	1.4	6.7	0.0	9.0	1	B
11080	Beets, raw	128.7	4.1	0.6	0.9	0.4	0.0	6.0	1	B
11091	Broccoli, cooked, boiled, drained, without salt	0.1	8.5	1.3	9.3	21.0	0.0	40.1	1	B
11090	Broccoli, raw	0.1	18.1	0.0	0.4	0.1	0.1	18.7	2	B

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11097	Broccoli raab, cooked	0.2	4.3	2.4	13.1	13.8	0.0	33.6	5	A
11096	Broccoli raab, raw	0.3	11.6	0.0	6.4	0.2	0.1	18.3	2	B
11099	Brussels sprouts, cooked, boiled, drained, without salt	0.2	23.4	3.2	0.0	14.1	0.0	40.7	1	B
11110	Cabbage, cooked, boiled, drained, without salt	0.3	7.6	4.0	1.4	7.2	0.0	20.2	1	B
11109	Cabbage, raw	0.4	6.1	2.9	1.3	0.3	0.0	10.6	1	B
11113	Cabbage, red, cooked, boiled, drained, without salt	0.1	5.0	6.1	2.5	7.9	0.0	21.5	1	B
11112	Cabbage, red, raw	0.1	9.7	4.0	2.0	1.5	0.0	17.2	1	B
11136	Cauliflower, cooked, boiled, drained, without salt	0.1	24.5	0.7	1.8	12.1	0.0	39.1	1	B
11960	Carrots, baby, raw	0.1	5.4	0.0	0.6	1.5	0.0	7.5	1	B
11125	Carrots, cooked, boiled, drained, without salt	0.1	0.4	0.4	1.1	6.8	0.0	8.7	1	B
11124	Carrots, raw	0.4	6.8	0.0	1.1	0.8	0.0	8.7	1	B
11935	Catsup	0.2	7.5	1.4	1.8	1.8	0.1	12.6	2	B
11143	Celery, raw	0.1	5.3	0.0	0.7	0.2	0.0	6.2	2	B
11179	Corn, sweet, yellow, frozen, kernels cut off cob, boiled, drained, without salt	0.2	8.9	0.6	1.7	10.7	0.0	21.9	1	B
11206	Cucumber, peeled, raw	0.1	3.5	0.5	0.7	0.9	0.0	5.6	1	B
11205	Cucumber, with peel, raw	0.1	4.0	0.5	0.9	0.6	0.0	6.0	1	B
11234	Kale, cooked, boiled, drained, without salt	0.3	0.1	0.0	0.0	0.3	0.0	0.4	1	B
11250	Lettuce, butterhead, raw	0.1	5.9	0.0	2.4	0.2	0.0	8.5	2	B
11251	Lettuce, cos or romaine, raw	0.1	7.6	0.0	1.6	0.7	0.0	9.9	3	B
11252	Lettuce, iceberg (includes crisphead types), raw	0.1	4.8	0.0	1.5	0.4	0.0	6.7	2	B
11257	Lettuce, red leaf, raw	0.2	7.9	0.0	3.4	0.5	0.0	11.8	1	B
11260	Mushrooms, raw	10.7	5.9	5.1	1.3	4.5	0.0	16.8	1	B
11282	Onions, raw	0.1	4.4	0.6	0.7	0.5	0.0	6.2	1	B
11294	Onions, sweet, raw	0.1	3.7	0.7	0.6	0.5	0.0	5.5	2	B
98012	Onions, yellow, sauted	0.1	3.4	0.6	0.6	1.9	0.0	6.5	1	B
11313	Peas, green, frozen, cooked, boiled, drained, without salt	0.1	2.2	0.8	0.7	23.9	0.0	27.6	1	B
11333	Peppers, sweet, green, raw	0.1	3.6	0.0	1.2	0.7	0.0	5.5	1	B
11339	Peppers, sweet, green, sauteed	0.1	0.4	0.4	1.2	2.8	0.0	4.8	1	B
11821	Peppers, sweet, red, raw	0.1	4.0	0.5	1.0	0.0	0.0	5.5	1	B
11921	Peppers, sweet, red, sauteed	0.1	1.2	0.5	1.5	2.9	0.0	6.1	1	B
11403	Potatoes, french fried, frozen, home-prepared, heated in oven, without salt	0.9	16.7	1.6	1.1	6.0	0.0	25.4	3	A

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11402	Potatoes, french fried, frozen, unprepared	0.7	14.8	1.4	1.0	5.1	0.0	22.3	2	B
11657	Potatoes, mashed, home-prepared, whole milk added	0.4	8.4	1.3	0.8	3.9	0.0	14.4	1	B
11358	Potatoes, red, flesh and skin, baked	0.2	8.5	3.8	1.2	5.3	0.0	18.8	2	B
11355	Potatoes, red, flesh and skin, raw	0.2	9.7	5.7	0.8	0.2	0.0	16.4	2	B
11356	Potatoes, Russet, flesh and skin, baked	0.2	8.1	1.6	0.7	4.6	0.0	15.0	3	A
11353	Potatoes, russet, flesh and skin, raw	0.2	10.1	1.7	0.7	0.1	0.0	12.6	1	B
11357	Potatoes, white, flesh and skin, baked	0.2	6.8	2.7	0.9	4.1	0.0	14.5	2	B
11354	Potatoes, white, flesh and skin, raw	0.2	7.9	2.6	0.3	0.2	0.0	11.0	2	B
11429	Radishes, raw	0.1	4.8	0.0	1.0	0.6	0.0	6.4	2	B
11439	Sauerkraut, canned, solids and liquids	0.5	8.7	0.9	0.0	0.6	0.2	10.4	2	B
11464	Spinach, frozen, chopped or leaf, cooked, boiled, drained, without salt	726.0	1.7	0.0	1.1	22.0	0.0	24.8	2	B
11463	Spinach, frozen, chopped or leaf, unprepared	675.0	2.2	0.2	1.4	18.2	0.0	22.0	3	A
98013	Spinach, frozen, whole leaf, cooked, microwaved	808.6	2.2	0.0	1.8	23.5	0.0	27.5	2	B
11478	Squash, summer, zucchini, includes skin, cooked, boiled, drained, without salt	0.3	0.5	0.7	2.4	5.7	0.0	9.3	1	B
11644	Squash, winter, all varieties, cooked, baked, without salt	0.2	2.1	0.6	2.6	5.3	0.0	10.6	1	B
11508	Sweetpotato, cooked, baked in skin, without salt	34.6	0.9	2.0	2.6	7.7	0.0	13.2	2	B
11546	Tomato products, canned, paste, without salt added	0.4	26.2	1.7	4.3	6.2	0.1	38.5	1	B
11549	Tomato products, canned, sauce	0.8	6.5	0.8	1.6	1.0	0.0	9.9	1	B
98011	Tomatoes, red, cooked, microwaved	0.1	4.4	0.0	1.9	1.8	0.0	8.1	2	B
11529	Tomatoes, red, ripe, raw, year round average	0.1	4.4	0.0	1.8	0.5	0.0	6.7	2	B
Nut and seed products										
12061	Nuts, almonds	0.5	9.4	1.2	1.9	39.5	0.0	52.0	5	A
12078	Nuts, brazilnuts, dried, unblanched	0.4	16.1	1.0	0.3	11.4	0.0	28.8	2	B
12586	Nuts, cashew nuts, oil roasted, with salt added	11.2	19.6	3.3	0.9	37.2	0.0	61.0	5	A
12120	Nuts, hazelnuts or filberts	0.4	15.2	5.0	0.9	24.7	0.0	45.8	5	A
12632	Nuts, macademia nuts, dry roasted, with salt added	0.3	11.3	1.8	1.0	30.4	0.0	44.5	5	A
12142	Nuts, pecans	0.7	9.7	6.1	1.3	23.4	0.0	40.5	5	A
12147	Nuts, pine nuts, pignolia, dried	0.4	8.4	0.7	2.1	44.6	0.0	55.8	5	A
12652	Nuts, pistachio nuts, dry roasted, with salt added	0.8	10.7	1.7	8.5	50.6	0.0	71.5	8	A
12154	Nuts, walnuts, black, dried	0.5	8.3	7.4	0.5	15.9	0.0	32.1	1	B

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12155	Nuts, walnuts, english	0.3	7.3	10.0	0.8	21.1	0.0	39.2	5	A
98014	Seeds, psyllium seed, husk powder (dietary fiber supplement)	2.9	5.2	0.9	0.0	2.5	0.0	8.6	1	B
12201	Seeds, sesame seed kernels, dried (decorticated)	0.4	9.6	3.1	2.8	10.2	0.0	25.7	1	B
Beef products										
23558	Beef, ground, 95% lean meat/5% fat, patty, cooked, broiled	7.4	2.2	3.3	0.3	72.0	7.6	85.4	12	A
23563	Beef, ground, 90% lean meat/10% fat, patty, cooked, broiled	7.9	2.2	3.1	0.3	70.5	7.7	83.8	12	A
23568	Beef, ground, 85% lean meat/15% fat, patty, cooked, broiled	8.5	2.2	3.0	0.3	69.0	7.9	82.4	12	A
23573	Beef, ground, 80% lean meat/20% fat, patty, cooked, broiled	9.0	2.3	2.8	0.3	67.5	8.0	80.9	12	A
23578	Beef, ground, 75% lean meat/25% fat, patty, cooked, broiled	9.5	2.3	2.6	0.3	66.0	8.2	79.4	12	A
13497	Beef, ground, 70% lean meat/30% fat, patty, cooked, broiled	12.8	1.9	1.6	0.2	64.5	9.1	77.3	12	A
23557	Beef, ground, 95% lean meat/5% fat, raw	7.8	2.5	3.3	0.2	58.5	6.3	70.8	12	A
23562	Beef, ground, 90% lean meat/10% fat, raw	7.9	2.5	3.1	0.3	54.0	6.1	66.0	12	A
23567	Beef, ground, 85% lean meat/15% fat, raw	8.1	2.5	3.0	0.3	49.6	5.8	61.2	12	A
23572	Beef, ground, 80%lean meat/20% fat, raw	8.2	2.6	2.8	0.4	45.1	5.6	56.5	12	A
23577	Beef, ground, 75% lean meat/25% fat, raw	8.4	2.6	2.6	0.4	40.6	5.4	51.6	12	A
13498	Beef, ground, 70% lean meat/30% fat, raw	8.5	2.6	2.4	0.5	36.1	5.1	46.7	12	A
13326	Beef, variety meats and by-products, liver, cooked, braised	5.6	61.8	83.1	11.6	245.6	24.0	426.1	4	A
13327	Beef, variety meats and by-products, liver, cooked, pan-fried	6.3	56.7	77.9	11.8	247.8	24.1	418.3	4	A
13325	Beef, variety meats and by-products, liver, raw	4.4	56.2	85.4	11.8	166.2	13.6	333.2	4	A
Beverages										
14006	Alcoholic beverage, beer, light	6.3	5.4	2.5	0.0	0.0	0.0	7.9	2	B
14003	Alcoholic beverage, beer, regular	8.1	5.7	4.2	0.0	0.0	0.0	9.9	2	B
14096	Alcoholic beverage, wine, table, red	0.3	4.5	1.1	0.0	0.0	0.0	5.6	1	B
14106	Alcoholic beverage, wine, table, white	0.2	3.4	1.4	0.0	0.0	0.0	4.8	2	B
14400	Carbonated beverage, cola, contains caffeine	0.1	0.0	0.3	0.0	0.0	0.0	0.3	2	B

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14416	Carbonated beverage, low calorie, cola or pepper-type, with aspartame, contains caffeine	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2	B
14150	Carbonated beverage, orange	0.1	0.0	0.6	0.0	0.0	0.0	0.6	1	B
14242	Cranberry juice cocktail, bottled	0.1	0.4	0.7	0.0	0.0	0.0	1.1	1	B
14209	Coffee, brewed from grounds, prepared with tap water	0.1	1.9	0.7	0.0	0.0	0.0	2.6	3	A
14218	Coffee, instant, decaffeinated, powder	0.7	93.7	8.2	0.0	0.0	0.0	101.9	1	B
98015	Iced tea, fast food, unsweetened	1.0	0.4	0.0	0.0	0.0	0.0	0.4	1	B
14347	Shake, fast food, vanilla	1.2	4.6	9.5	1.4	1.5	1.2	18.2	1	B
Finfish and shellfish products										
15141	Crustaceans, crab, blue, canned	12.6	0.1	2.5	0.3	26.2	4.4	33.5	1	B
15152	Crustacean, shrimp, mixed species, canned	33.0	1.5	4.9	0.8	67.1	6.6	80.9	2	B
15016	Fish, cod, Atlantic, cooked, dry heat	9.7	17.7	30.1	1.6	32.9	1.4	83.7	1	B
15027	Fish, fish portions and sticks, frozen, preheated	49.4	9.0	10.6	0.8	13.1	0.8	34.3	2	B
98018	Fish, fish sticks, breaded, frozen, unprepared, raw	62.1	6.2	14.0	0.9	15.7	1.0	37.8	1	B
15232	Fish, roughy, orange, cooked, dry heat	2.6	19.9	15.3	2.6	20.4	2.2	60.4	1	B
15073	Fish, roughy, orange, raw	2.4	12.1	3.9	2.7	15.8	1.6	36.1	1	B
15086	Fish, salmon, sockeye, cooked, dry heat	2.1	8.6	5.9	1.1	48.0	1.8	65.4	1	B
98016	Fish, tilapia, fillets, baked	25.3	21.4	1.2	2.5	53.7	4.1	82.9	1	B
98017	Fish, tilapia, fillets, raw	29.9	20.7	0.8	3.2	39.5	2.6	66.8	1	B
15121	Fish, tuna, light, canned in water, drained solids	2.7	2.1	5.9	0.0	18.4	2.9	29.3	1	B
Legumes and legume products										
16006	Beans, baked, canned, plain or vegetarian	0.1	17.1	1.3	0.8	12.3	0.0	31.5	1	B
16010	Beans, baked, canned, with pork and sweet sauce	0.1	12.8	1.6	0.9	9.2	0.0	24.5	1	B
16011	Beans, baked, canned, with pork and tomato sauce	0.4	25.1	1.6	1.0	11.5	0.0	39.2	2	B
98020	Beans, baked, pork and beans in tomato sauce, heated	0.1	10.9	1.6	0.9	10.8	0.0	24.2	1	B
98019	Beans, baked, vegetarian, heated	0.1	13.8	1.7	0.9	11.2	0.0	27.6	1	B
16029	Beans, kidney, all types, mature seeds, canned	0.1	19.7	2.0	0.5	12.6	0.0	34.8	1	B
16028	Beans, kidney, all types, mature seeds, cooked, boiled, without salt	0.1	14.2	2.2	0.6	13.5	0.0	30.5	1	B
16039	Beans, navy, mature seeds, canned	0.1	14.0	0.8	0.6	11.6	0.0	27.0	2	B
16038	Beans, navy, mature seeds, cooked, boiled, without salt	0.1	20.5	1.9	0.0	22.4	0.0	44.8	1	B

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16037	Beans, navy, mature seeds, raw	0.1	49.9	4.5	0.0	33.0	0.0	87.4	1	B
16043	Beans, pinto, mature seeds, cooked, boiled, without salt	0.1	11.4	1.3	0.1	22.3	0.0	35.1	4	A
16042	Beans, pinto, mature seeds, raw	0.4	31.7	2.9	0.8	30.9	0.0	66.3	1	B
16097	Peanut butter, chunk style, with salt	0.9	24.6	1.4	2.4	32.3	0.0	60.7	4	A
16098	Peanut butter, smooth style, with salt	0.4	25.8	1.1	0.7	38.0	0.0	65.6	2	B
16087	Peanuts, all types, raw	0.6	17.6	1.3	1.8	31.8	0.0	52.5	4	A
16120	Soy milk, fluid	0.8	13.1	1.3	3.4	5.7	0.0	23.5	1	B
98021	Soy protein powder, dietary supplement, cholesterol free, low fat enriched with vitamins	0.2	14.7	1.0	0.0	70.4	0.0	86.1	1	B
16123	Soy sauce made from soy and wheat (shoyu)	39.6	31.0	0.0	0.0	2.0	0.0	33.0	1	B
43133	Soyburger	5.0	9.9	1.8	0.4	2.2	0.0	14.3	1	B
16126	Tofu, firm, prepared with calcium sulfate and magnesium chloride (nigari)	0.4	8.3	0.6	0.0	19.2	0.0	28.1	1	B
16127	Tofu, soft, prepared with calcium sulfate and magnesium chloride (nigari)	0.4	9.7	0.7	0.0	16.9	0.0	27.3	1	B
Lamb, veal and game										
98022	Mutton, roasted from mutton sandwich	33.9	1.7	9.9	0.6	80.5	7.9	100.6	1	B
17203	Veal, variety meats and by-products, liver, cooked, braised	9.8	88.6	54.6	6.7	220.8	28.1	398.8	2	B
17204	Veal, variety meats and by-products, liver, cooked, pan-fried	8.1	92.9	56.8	9.7	224.3	27.3	411.0	2	B
17202	Veal, variety meats and by-products, liver, raw	7.6	85.3	64.0	11.1	132.7	16.8	309.9	2	B
Baked products										
18001	Bagels, plain, enriched, with calcium propionate (includes onion, poppy, sesame)	33.7	7.6	1.9	0.3	5.5	0.0	15.3	2	B
18002	Bagels, plain, toasted, enriched, with calcium propionate (includes onion, poppy, sesame)	36.5	8.5	2.0	0.3	5.6	0.0	16.4	2	B
18009	Biscuits, plain or buttermilk, commercially baked	43.0	6.9	1.3	0.6	0.2	0.0	9.0	1	B
18014	Biscuits, plain or buttermilk, refrigerated dough, higher fat	41.8	16.2	1.7	0.0	0.4	0.9	19.2	1	B
18015	Biscuits, plain or buttermilk, refrigerated dough, higher fat, baked	45.4	17.2	0.8	0.3	0.6	0.9	19.8	1	B
18029	Bread, french or vienna (includes sourdough)	55.1	6.9	3.4	0.4	4.1	0.0	14.8	1	B
18030	Bread, french or vienna, toasted (includes sourdough)	58.6	8.8	3.2	0.4	5.1	0.0	17.5	1	B

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18064	Bread, wheat (includes wheat berry)	85.2	11.5	3.7	0.3	3.1	0.0	18.6	1	B
18065	Bread, wheat, toasted (includes wheat berry)	92.4	14.2	3.6	0.3	4.0	0.0	22.1	1	B
18069	Bread, white, commercially prepared (includes soft bread crumbs)	101.9	8.6	3.7	0.1	2.3	0.0	14.7	2	B
18075	Bread, whole-wheat, commercially prepared	179.5	15.8	4.5	0.3	3.3	0.0	23.9	2	B
18100	Cake, chocolate, dry mix, regular, prepared without frosting	47.7	5.4	61.0	0.6	58.6	2.8	128.4	1	B
18452	Cake, snack cakes, cupcakes, chocolate, with frosting, low-fat	36.4	5.0	10.4	0.6	4.4	0.3	20.7	1	B
18141	Cake, yellow, commercially prepared, with vanilla frosting	18.7	4.6	1.3	0.0	28.9	1.5	36.3	1	B
18159	Cookies, chocolate chip, commercially prepared, reg, higher fat, enriched	42.8	8.9	1.4	0.5	6.2	0.0	17.0	1	B
18173	Cookies, graham crackers, plain or honey (includes cinnamon)	194.2	13.2	3.6	0.4	5.2	0.0	22.4	5	B
18927	Crackers, cheese, sandwich-type with cheese filling	244.1	6.7	15.1	1.3	4.4	0.0	27.5	1	B
18215	Crackers, cheese, sandwich-type with peanut butter filling	217.0	10.5	2.8	0.8	10.6	0.0	24.7	1	B
18228	Crackers, saltines (includes oyster, soda, soup)	55.3	12.6	6.3	0.0	0.7	0.0	19.6	1	B
18229	Crackers, standard snack-type, regular	51.9	8.2	3.9	0.0	1.7	0.0	13.8	1	B
18232	Crackers, wheat, regular	226.4	17.9	13.0	0.6	2.7	0.0	34.2	4	B
18235	Crackers, whole-wheat	212.4	17.1	2.8	0.5	2.4	0.0	22.8	1	B
18246	Danish pastry, fruit, enriched (includes apple, cinnamon, raisin, lemon, raspberry, strawberry)	14.3	8.7	2.2	0.7	9.5	0.7	21.8	4	B
98024	Danish pastry, plain	8.1	3.0	2.7	0.6	9.4	1.0	16.7	1	B
18249	Doughnuts, cake-type, plain, chocolate-coated or frosted	44.2	5.4	1.9	0.5	20.4	0.8	29.0	1	B
18248	Doughnuts, cake-type, plain (includes unsugared, old-fashioned)	63.4	4.9	3.0	0.6	27.8	1.1	37.4	1	B
18258	English muffins, plain, enriched, with ca prop (includes sourdough)	96.7	8.8	4.4	0.0	2.7	0.0	15.9	1	B
18259	English muffins, plain, toasted, enriched, with calcium propionate (includes sourdough)	118.0	11.7	5.7	0.0	2.5	0.0	19.9	1	B
18262	English muffins, raisin-cinnamon (includes apple-cinnamon)	82.3	9.2	3.2	0.4	3.0	0.0	15.8	1	B
18263	English muffins, raisin-cinnamon, toasted (includes apple-cinnamon)	95.0	12.7	3.6	0.5	2.6	0.0	19.4	1	B
18274	Muffins, blueberry, commercially prepared	35.8	3.9	3.6	0.7	41.4	2.2	51.8	1	B
18273	Muffins, plain, prepared from recipe, made with low fat (2%) milk	92.4	14.5	2.9	0.7	23.9	1.4	43.4	1	B

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98023	Pancakes, buttermilk, frozen, microwaved	69.0	4.1	11.9	0.9	9.9	1.3	28.1	2	B
18290	Pancakes, plain, dry mix, complete, prepared	26.0	5.4	1.5	0.0	11.4	0.9	19.2	1	B
18288	Pancakes, plain, frozen, ready-to-heat (includes buttermilk)	72.0	3.5	15.1	0.8	9.8	1.3	30.5	1	B
18301	Pie, apple, commercially prepared, enriched flour	16.4	4.7	1.0	0.0	1.5	0.0	7.2	1	B
18360	Taco shells, baked	0.4	8.1	3.3	2.7	15.8	0.0	29.9	1	B
18363	Tortillas, ready-to-bake or -fry, corn	0.4	4.1	2.4	0.2	6.5	0.0	13.2	1	B
18364	Tortillas, ready-to-bake or -fry, flour	5.3	4.6	1.5	0.2	1.7	0.0	8.0	1	B
18489	Toaster Pastries, KELLOGG, KELLOGG'S POP TARTS, Frosted strawberry	21.0	4.0	1.6	0.6	2.1	0.0	8.3	1	B
18488	Toaster Pastries, KELLOGG, KELLOGG'S POP TARTS, Strawberry	19.9	3.6	1.5	0.0	2.7	0.0	7.8	1	B
98026	Toaster Pastries, strawberry, frosted, toasted	21.8	4.5	1.5	0.9	2.3	0.0	9.2	1	B
98025	Toaster Pastries, strawberry, plain (not frosted), toasted	19.3	3.8	1.6	0.0	2.2	0.0	7.6	1	B
Sugars and sweets										
19078	Baking chocolate, unsweetened, squares	2.6	34.0	0.9	0.0	10.8	0.0	45.7	1	B
19120	Candies, milk chocolate	2.6	9.1	21.9	2.3	10.9	1.9	46.1	1	B
98033	Candies, milk chocolate coated, caramel and nougat bars with peanuts	0.9	11.8	11.2	1.7	12.7	0.7	38.1	2	B
98031	Candies, milk chocolate coated wafer bars	6.1	7.9	16.1	0.0	6.3	0.7	31.0	1	B
98032	Candies, milk chocolate pieces, sugar coated	1.3	9.6	22.1	3.1	7.5	1.3	43.6	1	B
19076	Candies, caramels, chocolate-flavor roll	1.4	6.2	5.0	2.9	4.2	0.3	18.6	1	B
19226	Frostings, chocolate, creamy, ready-to-eat	2.2	5.6	0.0	0.0	1.3	0.0	6.9	1	B
19230	Frostings, vanilla, creamy, ready-to-eat	2.6	0.8	0.0	0.0	1.5	0.0	2.3	1	B
42187	Frozen yogurts, flavors other than chocolate	0.9	5.1	9.2	2.1	4.8	1.8	23.0	1	B
98034	Frozen yogurts, vanilla, fat free	0.8	3.7	13.4	1.1	3.7	1.2	23.1	1	B
98036	Fruit spread, strawberry	0.1	2.8	10.7	0.5	0.3	0.0	14.3	1	B
98028	Gelatin desserts, strawberry- flavor, ready to eat	0.1	0.0	0.5	0.0	0.0	0.0	0.5	1	B
98029	Gelatin desserts, strawberry - flavor, with fruit juice, ready - to - eat	0.8	0.1	0.5	0.0	0.0	0.0	0.6	1	B
19270	Ice creams, chocolate	0.6	5.1	10.8	0.7	3.8	2.0	22.4	1	B
19095	Ice creams, vanilla	1.1	4.8	13.2	1.8	3.6	2.6	26.0	1	B
98035	Ice creams, vanilla, fat free, no sugar added	0.8	2.7	10.3	1.9	1.2	1.3	17.4	1	B

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98030	Ice creams, vanilla and sherbet, orange	0.6	1.8	6.2	1.6	3.3	2.7	15.6	2	B
19297	Jams and preserves	0.1	2.5	4.7	0.5	0.5	0.0	8.2	2	B
19304	Molasses	1.0	10.4	0.9	1.3	0.7	0.0	13.3	1	B
19183	Puddings, chocolate, ready-to-eat	0.9	4.3	3.6	0.8	0.7	0.0	9.4	2	B
Cereal grains, pastas and snacks										
20131	Barley malt flour	65.5	4.8	2.4	0.9	29.6	0.0	37.7	1	B
20010	Buckwheat groats, roasted, cooked	0.5	10.9	0.8	0.7	7.6	0.0	20.0	1	B
20022	Cornmeal, degermed, enriched, yellow	0.5	6.7	2.0	0.0	2.8	0.2	11.7	1	B
20110	Noodles, egg, cooked, enriched	19.2	9.3	0.9	0.0	15.5	0.0	25.7	1	B
20109	Noodles, egg, dry, enriched	131.7	50.4	2.3	0.0	26.0	0.0	78.7	1	B
20033	Oat bran, raw	35.7	4.4	33.3	0.7	20.2	0.0	58.6	1	B
20037	Rice, brown, long-grain, cooked	0.5	4.7	1.2	0.0	3.4	0.0	9.3	1	B
20045	Rice, white, long-grain, regular, cooked	0.3	0.7	0.9	0.0	0.4	0.0	2.0	2	B
20121	Spaghetti, cooked, enriched, without added salt	68.0	3.5	0.7	0.0	2.2	0.0	6.4	2	B
20120	Spaghetti, dry, enriched	460.0	9.7	1.4	0.0	4.0	0.0	15.1	2	B
20077	Wheat bran, crude	1506.8	50.2	4.4	2.1	17.8	0.0	74.5	1	B
98037	Wheat, bulgur cooked, simmered	83.4	2.7	0.8	0.7	2.7	0.0	6.9	1	B
20081	Wheat flour, white, all-purpose, enriched, bleached	124.4	5.7	1.4	0.1	3.2	0.0	10.4	2	B
Fast foods										
98039	Cheese pizza, frozen, regular thin crust, (heated)	25.9	6.7	1.4	0.8	4.2	0.9	14.0	1	B
98042	Chicken nuggets, frozen, (Cooked)	17.6	5.8	1.3	1.1	27.5	5.2	40.9	3	A
98041	Chicken nuggets, frozen (Uncooked)	22.8	5.5	2.1	1.5	31.5	4.9	45.5	1	B
98043	Chicken tenders, frozen, (Cooked)	29.1	3.8	1.4	1.1	28.1	5.0	39.4	2	B
98046	Fast foods, bagel with breakfast steak, egg, cheese and condiments	10.4	4.0	1.9	0.5	71.1	4.7	82.2	1	B
98044	Fast foods, bagel with ham, egg and cheese	11.0	3.7	2.7	0.4	86.7	4.7	98.2	1	B
98049	Fast foods, bagel with egg, sausage patty, cheese,condiments	11.3	3.9	2.6	0.5	72.4	4.4	83.8	1	B
21007	Fast foods, biscuit, with egg, cheese, and bacon	11.3	2.2	2.9	0.7	114.9	6.1	126.8	1	B
21009	Fast foods, biscuit, with sausage	9.1	3.2	3.1	0.4	18.0	2.0	26.7	1	B
98048	Fast foods, biscuit with sausage patty and egg	7.3	2.5	2.8	0.5	86.7	5.3	97.8	1	B

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98056	Fast foods, breast fillet	17.9	3.6	2.1	1.5	24.2	3.6	35.0	1	B
21060	Fast foods, burrito, with beans	15.4	16.3	1.0	0.0	9.5	0.0	26.8	1	B
21064	Fast foods, burrito, with beans, cheese, and beef	11.7	15.5	0.8	0.9	9.8	0.8	27.8	1	B
21100	Fast foods, cheeseburger, large, double patty, with condiments and vegetables	29.5	5.4	6.1	1.0	23.2	3.6	39.3	3	A
21098	Fast foods, cheeseburger, large, single patty, with condiments and vegetables	11.5	3.1	2.6	1.2	19.2	2.9	29.0	1	B
21037	Fast foods, chicken, breaded and fried, boneless pieces, plain	15.6	3.1	1.7	1.2	29.4	5.3	40.7	5	A
21102	Fast foods, chicken fillet sandwich, plain	28.5	5.5	4.2	1.0	21.4	3.2	35.3	3	A
98055	Fast foods, chicken sandwich, fried	60.0	7.3	4.8	0.8	18.3	2.6	33.7	2	B
98057	Fast foods, chicken tenders	16.6	2.7	1.4	0.9	33.8	4.9	43.7	3	B
98063	Fast foods, chocolate, dairy dessert	1.1	5.5	14.9	1.2	3.4	2.6	27.6	1	B
98053	Fast foods, cinnamon rolls	13.1	4.5	2.1	0.4	19.2	0.9	27.1	1	B
21011	Fast foods, croissant, with egg and cheese	10.4	3.2	4.8	0.4	79.7	4.2	92.3	1	B
21014	Fast foods, croissant, with egg, cheese, and sausage	13.3	3.4	3.7	0.7	71.6	4.6	84.0	1	B
98051	Fast foods, croissant with sausage and cheese	10.0	4.8	4.0	0.6	23.9	3.0	36.3	1	B
98052	Fast foods, english muffin with bacon, egg and cheese	7.3	3.3	2.1	0.4	50.3	2.8	58.9	1	B
98080	Fast foods, english muffin with egg	13.1	3.0	2.3	0.4	116.9	5.6	128.2	1	B
21022	Fast foods, english muffin, with egg, cheese, and sausage	10.0	2.9	2.6	0.5	92.4	4.9	103.3	1	B
98045	Fast foods, english muffin with sausage patty and cheese	19.1	4.5	3.1	0.4	19.3	2.6	29.9	1	B
21106	Fast foods, fish sandwich, with tartar sauce and cheese	98.2	7.4	11.3	0.5	12.2	1.2	32.6	1	B
98058	Fast foods, flour tortilla with beans, chicken and cheese	15.3	8.9	1.2	0.8	9.2	0.9	21.0	1	B
98059	Fast foods, flour tortilla with beans, steak and cheese	15.0	11.6	0.8	0.6	12.4	1.1	26.5	1	B
98060	Fast foods, flour tortilla with beef and cheese	17.5	11.1	1.2	0.9	10.9	1.5	25.6	1	B
98061	Fast foods, flour tortilla with chicken and cheese	19.2	7.5	1.3	1.2	15.2	2.0	27.2	1	B
98047	Fast foods, flour tortilla with sausage, egg, cheese and condiments	13.3	4.6	2.1	0.5	74.3	4.1	85.6	1	B
98062	Fast foods, flour tortilla with steak and cheese	19.0	7.7	0.6	0.6	17.8	2.4	29.1	1	B
21024	Fast foods, french toast sticks	9.1	6.4	2.3	0.0	5.1	0.2	14.0	1	B
21114	Fast foods, hamburger, large, double patty, with condiments and vegetables	46.4	9.5	5.7	0.8	21.4	3.1	40.5	2	B
21202	Fast foods, hamburger, large, single patty, with condiments	21.8	5.0	2.7	0.9	21.7	3.0	33.3	3	A
21107	Fast foods, hamburger, regular, single patty, plain	44.5	5.6	5.6	0.8	19.8	2.6	34.4	6	A

USDA Database for the Choline Content of Common Foods

NDB No ¹	Description	Betaine ²	Free Cho ²	GPC ²	Pcho ²	PtdCho ²	SM ²	Total Cho ³	N	CC ⁴
		mg/100g of food	mg choline moiety / 100 g of food							
98050	Fast foods, hotcakes with syrup and sausage	19.1	5.0	4.5	0.9	21.6	1.8	33.8	1	B
21078	Fast foods, nachos with cheese	0.7	4.8	10.8	0.7	9.2	0.8	26.3	1	B
21080	Fast foods, nachos, with cheese, beans, ground beef, and peppers	2.0	7.5	1.3	0.9	17.0	1.5	28.2	1	B
21138	Fast foods, potato, french fried in vegetable oil	0.5	10.7	2.4	1.5	6.2	0.0	20.8	3	B
21026	Fast foods, potatoes, hashed brown	11.0	7.2	1.6	0.5	8.2	0.2	17.7	1	B
21082	Fast foods, taco	3.3	10.6	1.0	1.0	17.3	2.0	31.9	1	B
21083	Fast foods, taco salad	10.9	8.8	1.0	0.8	11.5	1.3	23.4	1	B
98054	Meat and vegetable pizza, frozen (heated)	25.2	11.1	1.8	0.8	9.6	1.3	24.6	1	B
98040	Pepperoni pizza, frozen (heated)	19.8	11.3	2.1	1.0	10.2	1.8	26.4	1	B
21089	Sandwiches and burgers, cheeseburger, regular, single meat patty, plain	15.7	3.0	2.9	1.3	18.5	3.3	29.0	1	B
22902	Sausage and pepperoni pizza, frozen	18.8	8.1	1.6	0.4	10.7	1.3	22.1	1	B
Mixed dishes										
98073	Bean and cheese burrito, cooked	29.5	14.3	1.2	0.2	11.9	0.0	27.6	1	B
98072	Beef and bean burrito, cooked	34.0	15.1	1.1	0.0	11.7	0.2	28.1	1	B
98067	Beef stew, canned	1.8	2.9	1.1	0.6	9.8	1.1	15.5	1	B
22904	Chili con carne with beans, canned entree	0.9	11.6	1.5	0.6	11.9	1.5	27.1	1	B
98066	Lasagna with meat sauce, frozen	6.1	5.2	1.1	0.9	8.6	1.2	17.0	1	B
22247	Macaroni and Cheese, canned entree	43.2	2.8	1.1	0.4	1.1	0.0	5.4	1	B
98064	Macaroni and Cheese, canned, microwave	40.5	3.8	4.9	0.6	2.7	1.2	13.2	1	B
98070	Macaroni and Cheese, prepared with cheese powder, boxed	11.6	4.0	4.8	1.1	3.2	1.0	14.1	1	B
98071	Macaroni and Cheese, prepared with cheese sauce, boxed	19.4	4.3	12.8	0.8	3.0	1.4	22.3	1	B
98065	Spaghetti with meat balls in tomato sauce, canned	23.8	5.3	1.1	0.4	4.4	0.7	11.9	1	B
98069	Tamales	1.7	2.7	1.4	0.2	11.7	1.6	17.6	1	B
98068	Vegetable burgers, frozen	6.1	13.0	1.1	0.2	4.6	0.5	19.4	2	B
Snacks										
19003	Snacks, corn-based, extruded, chips, plain	0.1	1.9	0.7	0.0	9.5	0.0	12.1	1	B
19015	Snacks, granola bars, hard, plain	6.9	4.2	3.9	0.3	13.7	0.0	22.1	1	B

USDA Database for the Choline Content of Common Foods

NDB No ¹	Description	Betaine ²	mg choline moiety / 100 g of food					Total Cho ³	N	CC ⁴
		mg/100g of food	Free Cho ²	GPC ²	Pcho ²	PtdCho ²	SM ²			
19404	Snacks, granola bars, soft, uncoated, chocolate chip	21.6	7.1	1.9	0.4	7.4	0.0	16.8	1	B
19034	Snacks, popcorn, air-popped	0.8	7.2	2.4	0.0	11.6	0.0	21.2	1	B
98074	Snacks, popcorn, microwave, 94% fat free, butter flavor	0.3	5.4	2.6	0.0	4.9	0.0	12.9	1	B
19035	Snacks, popcorn, oil-popped	0.4	5.6	1.8	0.0	7.9	0.0	15.3	2	B
86552	Snacks, popcorn, oil-popped, butter and salt added	0.3	5.5	3.0	0.0	5.4	0.0	13.9	1	B
19411	Snacks, potato chips, plain, salted	0.2	4.6	0.0	0.0	7.5	0.0	12.1	1	B
19047	Snacks, pretzels, hard, plain, salted	295.1	16.3	16.4	0.5	3.5	0.0	36.7	3	B
19444	Snacks, tortilla chips, low fat, made with olestra, nacho cheese	0.3	4.6	1.7	0.0	13.9	0.2	20.4	1	B
19056	Snacks, tortilla chips, plain	0.4	4.2	2.7	0.0	12.6	0.0	19.5	1	B

¹ The NDB number is a five digit numerical code used in the USDA Nutrient Database for Standard Reference (SR). Foods in the table which do not have corresponding entries in SR are indicated by "98____" in the NDB column.

² Free Cho (Free Choline), Glycerophosphocholine (GPC), Phosphocholine (Pcho), Phosphatidylcholine (PtdCho) and Sphingomyelin (SM)

³ Total Choline refers to the sum of Free Choline, Glycerophosphocholine, Phosphocholine, Phosphatidylcholine and Sphingomyelin. Betaine is not included in the sum.

⁴ Confidence Code: an indicator of the relative quality of the data and the reliability of a given mean. Confidence code applies to Total choline only.