USDA Nutrient Data Set for Retail Veal Cuts, from the USDA National Nutrient Database for Standard Reference (SR)[1]

Prepared by

Janet M. Roseland, Quynhanh V. Nguyen, Juhi R. Williams, Kristine Y. Patterson (Ret.)

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

in collaboration with

Dale R. Woerner
Colorado State University, Department of Animal Sciences, Fort Collins, CO

And

Larry W. Douglass
Consultant, Longmont, CO

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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
Phone 301-504-0630
E-mail: ndlinfo@ars.usda.gov
Web site: http//www.ars.usda.gov/nutrientdata

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Purpose

The USDA Nutrient Data Set for Retail Veal Cuts provides retailers with a tool to obtain the most accurate veal nutrient data for the purpose of nutrition labeling. This data set focuses on the veal cuts identified by the USDA Food Safety and Inspection Service (FSIS) for nutrition labeling.

Introduction

Current nutrient composition data for veal products in the USDA National Nutrient Database for Standard Reference (SR) are used by for researchers and consumers who need access to these data for scientific and health purposes. Nutrient updates are important and necessary, in order to reflect the composition of currently available cuts. The USDA Nutrient Data Laboratory (NDL) has recently collaborated with Colorado State University in a veal research study designed to update or expand data in SR for specific veal retail cuts. In addition to providing current and accurate estimates for SR, these new data are also useful for enabling the industry to meet the USDA Food Safety and Inspection Service (FSIS) labeling regulations for fresh, single-ingredient meats implemented in 2011.

NDL research studies ensure that the most accurate veal nutrient data available are included in the National Nutrient Database for Standard Reference (SR) and will enable all other nutrient databases that link to the SR to use the most up-to-date nutrient data in nutrition research and surveillances. The objective of the research is to develop, update and maintain the food composition values for retail veal cuts in the USDA National Nutrient Database for Standard Reference (SR) and to assure that estimates of nutrient data are current and accurate. The objective of the dataset in this report, which is a subset of SR data, is to provide accurate nutrient data enabling vendors to comply with FSIS labeling for single ingredient meats for preparation of on-pack nutrient labels for various veal cuts (USDA-FSIS, 2012).

Retail Veal Cuts Study

A study was conducted with Colorado State University (CSU) to obtain nutrient and composition data for representative retail veal cuts. The objective of this study was to determine the physical characteristics and nutrient composition of cuts that are among the most popular veal cuts in the current retail market. This study generated analytical data for some cuts that had not previously been available in SR. Data for all of the veal cuts from the CSU study were released in SR 27 and are available at http://ndb.nal.usda.gov/ndb/.

The retail cuts were obtained, using a statistically based sampling plan to ensure representative sampling, from the six major US establishments which conduct their own slaughter of special fed (non-bob veal) US calves. The locations were Wyalusing PA, Collingswood NJ, Detroit MI, Harleysville PA, Franklin WI, and Vineland NJ.

Cooking

Prior to cooking, the retail cuts were tempered in at 0 to 4°C for 24 or 48 hours. Upon thawing, each individual retail cut was weighed to the nearest 0.1 g, and raw temperature was recorded. Prior to grilling, a Salton two-sided electric grill (Model GRP99, Salton Inc., Lake Forest, IL) was preheated to ensure a surface temperature of 195°C. Individual cuts were placed on the grill

surface and the cooking start time of each was recorded individually. Different cut types were cooked on separate grills. Due to the thinness of the leg cutlets, they were flipped after 1 minute on the grill and cooked for approximately 2.5 minutes or until the internal temperature reached 70°C.

Each loin and blade chop was cooked individually and was flipped after 4 minutes or when the internal temperature reached 35°C, to ensure even cooking. Temperatures were monitored using digital thermocouple thermometers (Digi-Sense; Cole Parmer, Vernon Hills, IL). Once a final internal temperature of 70°C was obtained, chops were removed from the grill surface and final internal temperature and cooked weight (to the nearest 0.1 g) were recorded.

Immediately after cooking, all cuts were placed on wire racks and allowed to chill uncovered, at refrigeration temperatures (0 to 4°C) for at least 12 hours before cooked dissection.

Sample dissection and laboratory analysis

Raw and cooked samples (n=6 per cut) were dissected using standard protocols. Weights of component factors for each cut, such as separable lean, separable fat, and bone and connective tissue, were determined. "Separable lean" includes muscle, intramuscular fat, and connective tissue that are considered edible. "Separable fat" includes any fat on the outside of the cut and seam fat (intermuscular fat deposits within the cut).

The separable lean, external trim fat, and seam fat were homogenized, composited, and analyzed at CSU for proximates (protein, moisture, fat, ash), fatty acids, cholesterol, and inductively coupled plasma (ICP) minerals. Selenium, the B-vitamins, vitamins D3 and 25(OH)D were analyzed at a validated commercial laboratory. Choline and vitamin E were analyzed at specialized laboratories. Details of analytical methods used in this study are presented in Appendix A.

Nutrient data quality control protocols used:

- Quality control samples were included with each batch of 10 to 20 samples;
- Laboratories were expected to run their own in-house control materials and to report those results;
- Quality control samples included materials developed by NDL cooperating laboratories and characterized with concurrent analysis of certified reference materials, as well as certified reference materials themselves. Blind duplicates were randomly included along with the unknown samples; and
- Only laboratories that NDL validated as having the ability to accurately analyze samples for nutrient content were used.

Data dissemination in SR

Nutrient values were released in SR27 (2014) for the blade chops and the loin chops in raw and cooked form (grilled) for "separable lean only" and "separable lean and fat". For the veal cutlet, nutrient values are provided for raw and cooked but not as "separable lean only" and "separable lean and fat" since no separable fat is present. Cooking yields were also calculated based on initial (raw) and final cooked weights.

Table Format

The table heading provides a general descriptive name for the food item and the unique Nutrient Databank number identifying the edible content of the cut, its preparation type, and cooking method: e.g., "lean and fat, raw", "lean and fat, cooked, grilled" and "lean only, cooked, grilled". Column 1 identifies the nutrient. The nutrient value unit is presented in column 2. Column 3 identifies the number of observations for each nutrient (N). An N of zero represents an estimated or calculated value. For raw preparations, nutrient values are expressed on a 100 g basis and 114 g basis (columns 4-5). The 114 g (4 oz) value represents the amount of raw product needed to yield 85 g (3 oz) of cooked product. For cooked preparations, data are presented on a 100 g and 85 g basis, which equals a serving of cooked meat. NDL source codes are provided in the final column. A source code of 1 indicates analytical data, source codes 4 and 6 represent imputed or calculated data, and source code 7 is used when the nutrient content is assumed to be zero. Appendix B provides analytical values for the proximates content (protein, water, fat, and ash) of the raw, separable lean for each cut.

The veal cuts in this dataset release are as follows:

Veal, leg, top round, cap off, cutlet, boneless
Veal, loin, chop
Veal, shoulder, blade chop

Nutrient Data Set files

The USDA Nutrient Data Set for Veal is presented as a PDF file. Adobe Acrobat Reader® is needed to view the report of the database. A Microsoft® Excel spreadsheet has also been prepared and is available for downloading from this web site (http://www.ars.usda.gov/nutrientdata). The user can download the data set, free of charge, for use with other programs. The tables in the Excel spreadsheet are in the same format and layout as those in the PDF file.

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Veal, leg, top round, cap off, cutlet, boneless

NDB No: 17426 raw; 17425 cooked, grilled

Nutrient Name	Unit	N[1]	*Raw*		*Cooked* *(Grilled)*		Source Code[2]
			100g	114g	100g	85g	
Water	g	6	75	86	65	56	1
Energy	Kcal	0	107	122	151	128	4
Calories from fat	Kcal	0	19	21	24	20	4
Protein	g	6	22	25	32	27	1
Total lipid (fat)	g	6	2	2	3	2	1
Ash	g	6	1.09	1.24	1.45	1.23	1
Carbohydrate, by difference	g	0	0	0	0	0	4
Fiber, total dietary	g	0	0	0	0	0	7
Sugars, total	g	0	0	0	0	0	7
Calcium, Ca	mg	6	4.0	4.6	6.0	5.1	1
Iron, Fe	mg	6	0.8	0.9	1.4	1.2	1
Sodium, Na	mg	6	86	98	88	75	1
Vitamin C, total ascorbic acid	mg	0	0	0	0	0	7
Vitamin A	IU	0	0	0	0	0	1
Fatty acids, total saturated	g	0	0.8	0.9	1.0	0.9	4
Cholesterol	mg	6	56	64	72	61	1
Magnesium, Mg	mg	6	30	34	38	32	1
Phosphorus, P	mg	6	212	242	277	235	1
Potassium, K	mg	6	273	311	323	275	1
Zinc, Zn	mg	6	2.0	2.2	3.3	2.8	1
Selenium, Se	mcg	1	16	18	22	18	1
Thiamin	mg	1	0.10	0.11	0.09	0.08	1
Riboflavin	mg	1	0.34	0.39	0.47	0.40	1
Niacin	mg	1	9.3	10.6	10.1	8.6	1
Pantothenic acid	mg	1	0.58	0.66	0.65	0.55	1
Vitamin B_6	mg	1	0.60	0.68	0.76	0.65	1
Vitamin B_{12}	mcg	1	2.1	2.4	2.7	2.3	1

[1] For some items, the number of observations may differ for lean and fat raw, lean and fat cooked, and lean only cooked. In these cases, the N values for each of the preparations are shown respectively. An N of zero represents an estimated or calculated value.
[2] Source codes: SC =1 – Analytical data, SC= 4 – Imputed data and # of observations set at 0, SC=6 – Recipe or known formulation, no adjustments applied, SC=7 - Assumed zero

Veal, loin, chop

NDB No: 17104 Lean and Fat, raw; 17437 Lean and Fat, cooked, grilled; 17427 Lean only, cooked, grilled

Nutrient Name	Unit	N[1]	Lean and Fat				Lean Only		Source Code[2]
			Raw		*Cooked (Grilled)*		*Cooked (Grilled)*		
			100g	114g	100g	85g	100g	85g	
Water	g	0/0/6	69	79	61	52	65	55	1
Energy	Kcal	0	177	202	198	168	159	135	4/6/4
Calories from fat	Kcal	0	91	103	85	73	40	34	4
Protein	g	0/0/6	20	23	28	24	30	25	1
Total lipid (fat)	g	0/0/6	10	11	9	8	4	4	1
Ash	g	0/0/6	0.96	1.09	1.03	0.88	1.09	0.93	1
Carbohydrate, by difference	g	0	0	0	0	0	0	0	6/6/4
Fiber, total dietary	g	0	0	0	0	0	0	0	6/6/7
Sugars, total	g	0	0	0	0	0	0	0	6/6/7
Calcium, Ca	mg	0/0/6	14.0	16.0	17.0	14.5	13.0	11.1	1
Iron, Fe	mg	0/0/6	0.8	1.0	0.8	0.7	0.8	0.7	1
Sodium, Na	mg	0/0/6	98	112	86	73	85	72	1
Vitamin C, total ascorbic acid	mg	0	0	0	0	0	0	0	6/6/7
Vitamin A	IU	0	0	0	0	0	0	0	1
Fatty acids, total saturated	g	0	3.6	4.1	3.4	2.9	1.7	1.5	6/6/4
Cholesterol	mg	0/0/6	59	67	79	67	78	66	1
Magnesium, Mg	mg	0/0/6	43	49	32	27	33	28	1
Phosphorus, P	mg	0/0/6	222	253	208	177	214	182	1
Potassium, K	mg	0/0/6	241	275	229	195	239	203	1
Zinc, Zn	mg	0/0/6	2.0	2.3	1.8	1.5	1.8	1.6	1
Selenium, Se	mcg	0/0/1	16	18	24	21	26	22	1
Thiamin	mg	0/0/1	0.08	0.09	0.07	0.06	0.07	0.06	1
Riboflavin	mg	0/0/1	0.28	0.32	0.31	0.27	0.33	0.28	1
Niacin	mg	0/0/1	6.6	7.5	7.5	6.4	7.9	6.7	1
Pantothenic acid	mg	0/0/1	0.63	0.72	0.54	0.45	0.55	0.47	1
Vitamin B_6	mg	0/0/1	0.60	0.69	0.64	0.54	0.69	0.59	1
Vitamin B_{12}	mcg	0/0/1	2.5	2.8	2.8	2.3	2.9	2.5	1

[1] For some items, the number of observations may differ for lean and fat raw, lean and fat cooked, and lean only cooked. In these cases, the N values for each of the preparations are shown respectively. An N of zero represents an estimated or calculated value.

[2] Source codes: SC =1 – Analytical data, SC= 4 – Imputed data and # of observations set at 0, SC=6 – Recipe or known formulation, no adjustments applied, SC=7 - Assumed zero

Veal, shoulder, blade chop

NDB No: 17128 Lean and Fat, raw; 17438 Lean and Fat, cooked, grilled; 17430 Lean only, cooked, grilled

Nutrient Name	Unit	N[1]	Lean and Fat				Lean Only		Source Code[2]
			Raw		*Cooked (Grilled)*		*Cooked (Grilled)*		
			100g	114g	100g	85g	100g	85g	
Water	g	0/0/6	73	83	63	54	66	56	1
Energy	Kcal	0	148	169	199	169	159	135	6/6/4
Calories from fat	Kcal	0	68	78	95	81	50	42	4
Protein	g	0/0/6	19	21	26	22	27	23	1
Total lipid (fat)	g	0/0/6	8	9	11	9	6	5	1
Ash	g	0/0/6	0.97	1.11	0.91	0.77	0.95	0.81	1
Carbohydrate, by difference	g	0	0	0	0	0	0	0	6/6/4
Fiber, total dietary	g	0	0	0	0	0	0	0	6/6/7
Sugars, total	g	0	0	0	0	0	0	0	6/6/7
Calcium, Ca	mg	0/0/6	23.0	26.2	24.0	20.4	21.0	17.9	1
Iron, Fe	mg	0/0/6	1.2	1.4	1.6	1.4	1.7	1.4	1
Sodium, Na	mg	0/0/6	91	104	111	94	113	96	1
Vitamin C, total ascorbic acid	mg	0	0	0	0	0	0	0	6/6/7
Vitamin A	IU	0	0	0	0	0	0	0	1
Fatty acids, total saturated	g	0	2.7	3.1	3.7	3.2	2.1	1.8	6/6/4
Cholesterol	mg	0/0/6	62	71	78	66	77	65	1
Magnesium, Mg	mg	0/0/6	32	36	33	28	34	29	1
Phosphorus, P	mg	0/0/6	202	230	242	206	253	215	1
Potassium, K	mg	0/0/6	198	226	235	200	245	208	1
Zinc, Zn	mg	0/0/6	3.2	3.6	4.7	4.0	5.1	4.3	1
Selenium, Se	mcg	0/0/6	15	17	17	15	18	16	1
Thiamin	mg	0/0/1	0.10	0.12	0.10	0.09	0.11	0.09	1
Riboflavin	mg	0/0/1	0.40	0.45	0.45	0.38	0.48	0.41	1
Niacin	mg	0/0/1	4.5	5.1	4.9	4.2	5.1	4.4	1
Pantothenic acid	mg	0/0/1	0.97	1.11	1.10	0.93	1.18	1.00	1
Vitamin B_6	mg	0/0/1	0.44	0.50	0.41	0.35	0.44	0.37	1
Vitamin B_{12}	mcg	0/0/1	2.7	3.1	3.4	2.9	3.7	3.1	1

[1] For some items, the number of observations may differ for lean and fat raw, lean and fat cooked, and lean only cooked. In these cases, the N values for each of the preparations are shown respectively. An N of zero represents an estimated or calculated value.
[2] Source codes: SC =1 – Analytical data, SC= 4 – Imputed data and # of observations set at 0, SC=6 – Recipe or known formulation, no adjustments applied, SC=7 - Assumed zero

Appendix A – Analytical methods

NUTRIENT	TECHNIQUE	METHOD
Nitrogen	Combustion	AOAC 992.15 Protein (Crude)
Fat	Extraction	Folch et al. (1957) J. Biol. Chem., 226; 497-509 or AOAC 983.23
Ash	Gravimetric	AOAC 923.03 Ash of Flour
Moisture	Forced air	AOAC 950.46 Moisture in Meat
Minerals	Inductively coupled plasma (ICP)	AOAC 985.35 for Ca, Cu, Fe, Mg, Mn, K, Na and Zn
	Colorimetric	AOAC 13th Ed. 2.019, 2.095, 7.098 Phosphorus in food
Selenium	Hydride generation	AOAC 986.15 Arsenic, Cadmium, Lead, Selenium and Zinc in Human and Pet Foods
Thiamin	Fluorometric	AOAC 942.23 + 953.17 + 957.17
Riboflavin	Microbiological	AOAC 940.3 + 960.46
Niacin	Microbiological	AOAC 944.13 + 960.46
Pantothenic Acid	Microbiological	AOAC 945.74 + 960.46
Vitamin B6	Microbiological	AOAC 961.15
Vitamin B12	Microbiological	AOAC 952.20 + 960.46
Choline	Mass spectrometry	Koc et al. (2002)
Fatty acids	Gas chromatography (GC)	AOAC 996.06 Fat (Total, Saturated and Monosaturated) in foods
Vitamin E	Liquid chromatography (HPLC)	UV detection with external calibration and internal standard recovery post analysis.
Vitamin D3 and 25-hydroxy D3	Liquid chromatography/ mass	Huang et al. (2009)
Cholesterol	GC/Direct saponification	Dinh et al. (2008)

Appendix B: Proximates content per 100 grams of "separable lean" meat, raw

Description	Nutrient	Unit	100g	N	Source Code
Veal, loin, separable lean only, raw	Water	g	74.79	6	1
	Protein	g	21.85	6	1
	Total lipid (fat)	g	2.90	6	1
	Ash	g	1.04	6	1

Description	Nutrient	Unit	100g	N	Source Code
Veal, shoulder, blade chop, separable lean only, raw	Water	g	76.29	6	1
	Protein	g	19.60	6	1
	Total lipid (fat)	g	2.88	6	1
	Ash	g	1.01	6	1