

Development of Beef and Pork Nutrient Tables on Retail Cuts Available for Use by Industry

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Abstract: The National Nutrient Data Laboratory (NDL), in collaboration with several universities, National Pork Board, and the National Cattlemen's Beef Association, has conducted research studies designed to update or expand the data on pork and beef cuts in the USDA National Nutrient Database for Standard Reference (SR). In addition, NDL has developed specific tables for pork and beef products for several nutrients including the mandatory nutrients required by the USDA Food Safety Inspection Service (FSIS) for single-ingredient meat cuts. Meat labeling was implemented by March 2012. Beef and pork studies were planned to provide nutrient data for labeling raw, single-ingredient meat cuts as specified by FSIS. Using statistically designed sampling plans, products were procured at either retail food stores nationwide (pork) or wholesale production facilities (beef). Retail beef cuts were fabricated, dissected and homogenized for analysis at three university meat labs. The pork samples were all handled at one university meat lab for dissection and homogenization. Nutrient analyses were performed at university and commercial labs which had been prequalified through the USDA National Food and Nutrient Analysis Program. Analytical control materials were included with all batches. The results were reviewed and processed at NDL and incorporated into the SR and the new retailer's data tables. These retailer's nutrient tables for pork (USDA Nutrient Data Set for Fresh Pork 2.0) and beef (USDA Nutrient Data Set for Retail Beef Cuts Release 2.0) are available on the NDL website: <http://www.ars.usda.gov/Services/Services.htm?modecode=12-35-45-00>. These publications will provide the pork and beef retailers with easy access to current and accurate data to comply with USDA's FSIS labeling regulation for fresh single-ingredient meats.

Introduction

The National Nutrient Data Laboratory (NDL), in collaboration with several universities, National Pork Board, and the National Cattlemen's Beef Association, has conducted research studies designed to update or expand the data on pork and beef cuts in the USDA National Nutrient Database for Standard Reference (SR). On December 29, 2010, the Food Safety and Inspection Service (FSIS) published the final rule "Nutrition Labeling of Single-Ingredient Products and Ground or Chopped Meat and Poultry Products."¹ The final rule requires nutrition labeling of the ground and major cuts of raw, single-ingredient meat and poultry products, unless an exemption applies. Nutrition information for these products is required either on the label or at the point-of-purchase. Therefore, NDL has developed tables for pork and beef retail cuts and ground products which highlight the nutrients required by FSIS for labeling of meat products. This ruling was implemented in March 2012.

Objective

To provide nutrient data for fresh pork and beef retail cuts in a table format on the NDL website for use in labeling by meat retailers to meet FSIS requirements.

Methodology

Sampling: Pork products were purchased from 12 retail outlets using the nationwide sampling Plan developed for USDA's National Food and Nutrient Analysis Program². Nationally representative beef carcasses were obtained from major commercial processing plants or feedlots based on quality grade, yield grade, gender and genetics, and thereby reflected the availability of each type of carcass to the retail market.

Sample preparation: Beef carcasses were fabricated into popular retail cuts. For beef and pork cuts, separable fat, bone and connective tissues were removed from each cut; separable fat from all portions was combined and composited prior to nutrient analyses. Lean portions were composited by cut for nutrient analysis.

Analyses: Label nutrient values for proximates (ash, moisture, protein, and total fat) were determined by university (beef) or commercial (pork) laboratories using standard AOAC methodology³. Minerals were analyzed by atomic absorption (beef) or inductively coupled plasma (pork) methodology³.

Quality Control: Quality assurance was monitored through the use of commercial reference materials, in-house control materials and random duplicate sampling.

Table preparation: Forty major beef, pork, game and poultry retail cuts were identified by FSIS for mandatory nutrient labeling. The nutrient profiles for these required beef and pork cuts are listed in the nutrient tables and in the National Nutrient Database for Standard Reference. Data are provided as lean and fat (raw and cooked), and lean only (cooked). Data are given on edible portion sizes for 100g or 115g (4 oz) for raw and 100g or 85 g (3 oz) for cooked. Ground pork products are categorized into low, medium and high fat levels.

Data sets listed below are an example of the retailer's tables on the NDL website.

USDA Nutrient Data Set for Fresh Pork Cuts Release 2.0 and USDA Nutrient Data Set for Retail Beef Cuts Release 2.0

Nutrient Name	Unit	N	Lean and Fat		Lean Only		Source Code ¹	
			Raw		Cooked (Broiled)			
			100g	115g	100g	85g		
Water	g	12	70.59	80.95	63.07	53.61	85.34	
Energy	Kcal	0	156	180	196	165	173	
Calories from fat	Kcal	0	62	72	81	69	55	
Protein	g	12	21.95	25.25	26.69	22.68	27.58	
Total lipid (fat)	g	12	6.92	7.97	8.94	7.65	6.08	
Ash	g	12	0.97	1.12	1.00	0.85	1.03	
Carbohydrate, by difference	g	0	0.0	0.0	0.0	0.0	0.0	
Fiber, total dietary	g	0	0.0	0.0	0.0	0.0	0.0	
Sugars, total	g	0	0.0	0.0	0.0	0.0	0.0	
Calcium, Ca	mg	12	7	8	7	6	5	
Iron, Fe	mg	12	0.50	0.57	0.63	0.54	0.63	
Sodium, Na	mg	12	48	56	44	38	45	
Vitamin C, total ascorbic acid	mg	0	0.0	0.0	0.0	0.0	0.0	
Vitamin A	IU	1	0.0	0.0	0.0	0.0	0.0	
Fatty acids, total saturated	g	12	2.449	2.817	3.109	2.635	2.085	
Fatty acids, total trans	g	12	0.064	0.073	0.084	0.071	0.062	
Cholesterol	mg	12	67	77	73	62	72	
Magnesium, Mg	mg	12	26	36	26	22	27	
Phosphorus, P	mg	12	226	260	231	196	237	
Potassium, K	mg	12	374	430	358	304	367	
Zinc, Zn	mg	12	1.66	1.78	2.09	1.78	2.15	
Selenium, Se	mcg	12	33.1	51.3	43.7	37.1	45.3	
Thiamin	mg	12	0.667	0.767	0.638	0.542	0.658	
Riboflavin	mg	12	0.185	0.212	0.191	0.162	0.195	
Niacin	mg	12	7.969	8.187	8.269	7.021	8.513	
Pantothenic acid	mg	4	0.727	0.806	0.681	0.579	0.600	
Vitamin B6	mg	4	0.726	0.835	0.698	0.593	0.722	
Vitamin B12	mcg	4	0.82	0.81	0.89	0.82	0.86	
		1					0.47	

Cuts were cooked with separable fat present. separable fat was removed prior to nutrient analyses
¹ Source codes : SC = 1 - Analytical data, SC = 4 - Imputed data and # of observations set at 0, SC = 7 - Assumed zero



Nutrient Name	Unit	N	Lean and Fat		Lean Only		Source Code ¹	
			Raw		Cooked (Broiled)			
			100g	115g	100g	85g		
Water	g	11	82	71	56	47	62	
Energy	Kcal	0	246	263	273	232	206	
Calories from fat	Kcal	0	181	185	160	136	82	
Protein	g	11	20	23	26	22	29	
Total lipid (fat)	g	11	18	21	18	15	9	
Ash	g	11	0.94	1.08	1.01	0.86	1.04	
Carbohydrate, by difference	g	0	0	0	0	0	0	
Fiber, total dietary	g	0	0	0	0	0	0	
Sugars, total	g	0	0	0	0	0	0	
Calcium, Ca	mg	0	24.7	28.4	17.2	14.8	16.0	
Iron, Fe	mg	0	1.4	1.6	1.8	1.5	2.0	
Sodium, Na	mg	0	50	57	52	44	59	
Vitamin C, total ascorbic acid	mg	0	0	0	0	0	0	
Vitamin A	IU	1	0	0	0	0	0	
Fatty acids, total saturated	g	0	7.2	8.3	7.0	6.0	3.5	
Cholesterol	mg	0	85	98	99	84	85	
Magnesium, Mg	mg	0	20	23	21	18	21	
Phosphorus, P	mg	0	177	204	198	166	223	
Potassium, K	mg	0	303	348	316	270	358	
Zinc, Zn	mg	0	3.5	4.0	4.7	4.0	5.4	
Selenium, Se	mcg	0	21	25	28	24	33	
Thiamin	mg	0	0.05	0.06	0.07	0.06	0.08	
Riboflavin	mg	0	0.08	0.09	0.12	0.1	0.15	
Niacin	mg	0	6.4	7.4	7.2	6.1	8.6	
Pantothenic acid	mg	0	0.59	0.67	0.52	0.44	0.57	
Vitamin B6	mg	0	0.53	0.61	0.53	0.45	0.6	
Vitamin B12	mcg	0	1.1	1.3	1.7	1.5	1.5	
		1						

¹ Source codes: SC = 1 - Analytical data, SC = 4 - Imputed data and # of observations set at 0, SC = 7 - Assumed zero

Mandatory Nutrients identified by FSIS for Labeling Purposes
Calories
Total fat
Saturated fat
Cholesterol
Protein
Total carbohydrates
Calcium
Iron
Sodium
Vitamin A
Vitamin C
Sugars
Dietary fiber

Results

The retailer's nutrient tables for pork (USDA Nutrient Data Set for Fresh Pork Release 2.0) include 9 fresh pork cuts; bone-in shoulder blade steak, boneless tenderloin roast, boneless top loin chop, boneless top loin roast, bone-in sirloin roast, bone-in center loin chop, bone-in center rib chop, bone-in country-style ribs, and bone-in spare ribs. Nutrient values for ground pork are provided at three fat levels in three preparation methods: low fat (2 - 6%), medium fat (14 - 17%) and high fat (26 - 30%).

The nutrient tables for beef (USDA Nutrient Data Set for Retail Beef Cuts Release 2.0) includes 18 cuts (select and choice): Bottom round steak, tip round roast, top sirloin steak, tenderloin steak, flank steak, tri-tip roast, shoulder tender medallion, top blade steak, shoulder top and center steak, shoulder pot roast boneless, shoulder steak boneless, mock tender steak, flat half boneless, shoulder top blade steak, top loin steak, top round steak, short ribs boneless, and small end ribs.

These nutrient data sets list the mandatory nutrient labels (listed below) required by FSIS plus additional selected minerals and vitamins that may be useful to consumers and retailers.

The complete data set for all 54 items of beef and pork items are available on the NDL website: <http://www.ars.usda.gov/Services>

Conclusion

Nutrient data for major single-ingredient meat cuts for pork and beef are currently in SR and in the retailer's tables. Data on additional retail cuts will be added and updated based on FSIS's requirements.

These beef and pork data sets provide meat packers, retailers, and industries with a tool to find the most accurate beef or pork nutrient data for the purpose of on-pack nutrition labeling. These data sets focus on the beef and pork nutrient data identified by USDA's FSIS labeling regulations for fresh single-cut ingredient meats.

The consumers at the retail level depend on nutrition labeling for making leaner and healthier choices.

References

1. Nutrition Labeling of Single- Ingredient Products and Ground or Chopped Meat and Poultry Products. <http://www.fsis.usda.gov/>
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3. Association of Official Analytical Chemists. 1995. Official Methods of Analysis of the Association of Official Analytical Chemists, 16th edition. Washington DC.