

Soyfoods Association of North America

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July 15, 2010

Carole Davis

Co-Executive Secretary and Designated Federal Officer (DFO) of the Dietary Guidelines
Advisory Committee Center for Nutrition Policy and Promotion
U.S. Department of Agriculture
3101 Park Center Drive, Room 1034
Alexandria, VA 22302

Dear Ms Davis:

The Soyfoods Association of North America (SANA), a trade association of soy farmers, processors, soyfoods manufacturers, and soyfoods educators, appreciates the efforts of the US Department of Agriculture (USDA) and the US Department of Health and Human Services (DHHS) in encouraging Americans to consume a healthful plant-based diet. The DHHS and USDA *Dietary Guidelines for Americans* plays a vital role in steering the nutritional content of the federal food assistance programs and nutrition education programs that promote the public's health and well-being. These guidelines are the cornerstone of all food and nutrition policy and communication. SANA members value the extensive review of the scientific research on nutrition that the Dietary Guidelines Advisory Committee (DGAC) used to compile the 2010 report. We would like to share our feedback on several sections of the DGAC Report related to categorizing and defining soyfoods/soy products apart from "cooked dry beans and peas," protein quality and nutritional adequacy that may help shape the 2010 Dietary Guidelines for Americans document and consumer materials emerging from the Report.

Categorizing and Defining Soyfoods/Soy Products

Within the Executive Summary, the report advises the American public to "shift food intake patterns to a more plant-based diet that emphasizes vegetables, cooked dry beans and peas, fruits, whole grains, nuts and seeds." Absent from this detailed list of foods are soyfoods/soy products. Soyfoods/soy products are a major plant food in the diets of a growing number of health seeking Americans, several ethnic groups, and vegetarians. Because of the regular availability of soyfoods in schools, restaurants, company food service operations, and grocery stores, consumers would benefit from the 2010 Dietary Guidelines highlighting soyfoods from the cooked dry beans and peas when referencing the Meat and Bean group and when making recommendations for foods to choose for a plant-based diet for reasons further described below.

One of the study questions addressed by the committee in Appendix E-3.3 was "How will plant-based or vegetarian food patterns, adapted with the USDA food patterns, meet IOM Dietary Reference Intakes and potential DG 2010 nutrient recommendations?" The DGAC Report listed the Meat & Beans group as containing the following foods: meats, poultry, fish, eggs, soy products, cooked dry beans and peas and nuts/seeds. This same distinction that separated and

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identified soyfoods/soy products from the cooked dry beans and peas should be made throughout future scientific, policy and consumer documents on the Dietary Guidelines.

However, absent in appendix E-2 (Glossary) of the report is a definition or reference for soyfoods/soy product. Under the definition for “Protein,” (page E2-7) both animal proteins and vegetable proteins are defined. Yet, the vegetable proteins refer to legumes, dry bean, grains, nuts, seeds and vegetables, but fail to explicitly mention soyfoods/soy products. SANA suggests that the policy and educational documents provide a definition for soy protein and distinguish soyfoods/soy products apart from the “dry beans and peas and nuts/seeds” groups, based on the differences in protein quality.

Protein Digestibility Corrected Amino Acid Score (PDCAAS)

As described within the DGAC Report – Part D, protein quality is determined by two factors (digestibility and amino acid profile). These factors can be represented by use of the protein digestibility corrected amino acid score (PDCAAS). The Food and Agriculture Organization (FAO) and the World Health Organization (WHO) Joint Expert Consultation’s Protein Quality Evaluation Report¹ recommend PDCAAS, as a simple, scientific and rational procedure for assessing protein quality. The United States Institute of Medicine (IOM) in its 2005 discussion of Daily Reference Intakes reaffirmed the use of PDCAAS for evaluating the relative nutritional quality of different protein sources.² Furthermore, the US Food and Drug Administration (FDA) adopted the use of PDCAAS for the protein quality evaluation of foods in 1993. PDCAAS values for soy protein isolate and soy protein concentrates are greatest among commonly consumed plant proteins and comparable to animal-based protein sources. As USDA and DHHS develop policy and consumer documents, the agencies should revise the language in the DGAC report, and recognize that soy is a high-quality plant protein comparable to animal-based proteins, and has the added benefits of no cholesterol and very little saturated fat.

Chronic Diseases and Weight Management

For all of the research questions on plant proteins and their relation to various health outcomes, the Committee only utilized research published since 2000, as they felt it represented the current knowledge base on plant-based dietary patterns (page D4-5). In comparison, the Committee agreed with the 2005 DGAC review of research on milk and milk products that included research well before 2000, and the Nutrition Evidence Library (NEL) only provided an updated review of evidence from June 2004 to 2009. The NEL analysis of plant-based diets should not be limited to a decade of research, but should have been similar to the analysis of animal-based diets and foods that span across numerous decades. Moreover, we recommend USDA and DHHS fund additional research on plant-based diets, soy protein, and soyfoods and their relationships to heart health, weight management and diabetes prevention.

¹ FAO/WHO (1991). Protein Quality Evaluation; FAO Food and Nutrition Paper 51, Rome, Italy

² Institute of Medicine (2005). Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein and Amino Acids, Washington, DC: The National Academies Press.

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Bioavailability of Calcium in Soymilk

Fortified soymilk is a good source of calcium, vitamin A, vitamin D, riboflavin, potassium, magnesium, phosphorus, high-quality protein and other vitamins and minerals comparable to dairy, but without saturated fat or cholesterol. By identifying the option for Americans to choose fortified nondairy beverages (such as soymilk) in place of liquid milk, the Dietary Guidelines documents could better serve a diverse population who avoid dairy products for health, religious, or other special needs. For example, a study in the *American Journal of Clinical Nutrition* confirms that soy products are consumed by 90 percent of healthy Asian children, with 95 percent of these children consuming soyfoods before 18 months of age.³ The WIC program also includes tofu as a source of calcium. These soy-based products are culturally preferable to milk with some groups and may be consumed by individuals with [milk allergies] and lactose mal-digestion.⁴ Furthermore, the WIC program currently includes tofu as a source of calcium.

Table 1 below provides the nutritional composition of eight fluid ounces of fortified regular and light soymilk according to the most current USDA/ARS Nutrient Database, Release 22 compared to various milks. Fortified soymilk is also available with various fat levels and sugar free. Several fortified soymilks available through the WIC program and the National School Lunch and Breakfast Programs have been specifically formulated to meet the USDA requirement of “nutritionally equivalent to milk” for these programs.

Fortified soymilk has been shown in a *Journal of the American Dietetic Association* to be readily acceptable by children in school.⁵ This study also shows that children drinking fortified soymilk receive more calcium per gram of saturated fat than those children consuming fluid milk, because of the low saturated fat content of soymilk. A 2005 study⁶ published in the *Journal of Nutrition* compared the calcium bioavailability of cow’s milk and soymilk fortified with calcium and found that, whether fortified with calcium carbonate (CC) or tri-calcium phosphate (TCP), the calcium-fortified soymilk provided more absorbable calcium than equal amounts of cow’s milk. A 1994 study in the *American Journal of Clinical Nutrition* showed that there is only a 32 percent calcium absorption rate from cow’s milk, whereas fortified soymilk, tofu, and tempeh calcium absorption rate has been shown to be “excellent.”⁷ These studies should remove question about the calcium bioavailability in fortified soymilks.

³ Quak SH, Tan SP. Use of soy-protein formulas and soyfood for feeding infants and children in Asia. *Am J Clin Nutr.* 1998;68:1444S-1446S

⁴ Ibid. page 44828.

⁵ Reilly JK, Lanou AJ, Barnard ND, Seidl K, Green AA, Acceptability of soymilk as a calcium-rich beverage in elementary school children, *J. Am. Diet. Assoc.* 2006; 106:590-593.

⁶ Zhao Y, Martin BR, Weaver CM. Calcium bioavailability of calcium carbonate fortified soymilk is equivalent to cow's milk in young women. *J Nutr.* 2005;135:2379-82.

⁷ Weaver CM, Plawecki KL. Dietary calcium: adequacy of a vegetarian diet. *Am J Clin Nutr* 1994; 59(suppl):1238S-41S.

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Other recent studies concerning calcium availability and bioavailability in fortified soymilks have used questionable sample methods and analytical methods that are not representative of the entire soymilk category.⁸ SANA believes that current industry testing of fortified soymilk ensures that there is a reliable amount of calcium availability in fortified soymilks and that fortified soymilk is an excellent source of calcium for people who suffer from severe lactose intolerance, have milk allergies, or avoid milk for cultural, religious, or other personal reasons.

Hence, SANA would suggest that the general term fortified soymilk be used throughout the report and that comments about the bioavailability of calcium be based on the most current research using commercially available soymilk. In the future, to determine calcium status comparability among beverages, nutritionists should consider the bone retention of calcium as well as calcium absorbability.

Vegetarian Diets

The recent 2009 position statement by the American Dietetic Association on Vegetarian Diets included reviews of the key nutrients of concern for vegetarians including protein, n-3 fatty acids, iron, zinc, iodine, calcium and Vitamins B-12 and D.⁹ They conclude that well-planned vegetarian diets are healthful, nutritionally adequate and may provide healthful benefits in the prevention and treatment of certain diseases. In Table 2, we outline some common soyfoods and compared them with animal-based protein products. Please observe that many of the soyfoods contain comparable amounts of the concerned nutrients as their animal-based counterparts.

In Appendix E-3.3, SANA would also like to highlight that the amounts of potassium in the vegetarian patterns were 3-5 percent higher than the USDA base pattern. The vegan pattern was also much lower in cholesterol than other patterns and the sodium intake was lower, while the fiber intake was 23 to 43% higher than the USDA base pattern.

Consumer Brochure

As the agencies move forward in producing consumer-friendly documents, SANA recommends that educational visuals captivate, motivate and display to consumers how to adopt a more plant-based diet. This should be done through graphics and tables that can be easily recognized and mentally retained by the consumer. An example of such a graphic is page 3 of the “Finding Your Way to a Healthier You.”¹⁰ Other great visuals from Federal documents include pages 4, 5 and 7 in the “Just Enough for You: About Food Portions.”¹¹

⁸ Reilly, J. Letter to the Editor. *J. Am Diet. Assoc.* 2006; 106 (11):1755.

⁹ Craig WJ, Mangels AR. Position of the American Dietetic Association: Vegetarian Diets. *J Am Diet Assoc.* 2009 Jul;109(7):1266-82.

¹⁰ “Finding Your Way to a Healthier You.” Accessed at <http://www.health.gov/dietaryguidelines/dga2005/document/pdf/brochure.pdf>.

¹¹ “Just Enough For You: About Food Portions.” Accessed at <http://www.win.niddk.nih.gov/publications/PDFs/justenough.pdf>.

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In conclusion, SANA suggests that in translating the Scientific Report from the Dietary Guidelines Advisory Committee into policy and consumer documents, that DHHS and USDA consider the following suggestions:

1. Distinguish soy products/soyfoods separately from “cooked dry beans and peas and seeds/nuts.”
2. Recognize that soy protein is comparable to animal protein in protein quality, based on the widely recognized methodology, Protein Digestibility Corrected Amino Acid Score (PDCAAS).
3. Highlight the nutritional adequacy and high-quality protein value of soyfoods.
4. Support further research on the health benefits of plant-based diets and soyfoods in relation to heart disease, weight management and diabetes prevention.
5. Create a consumer brochure that balances simple text with menu tables, graphics and other visuals which captivates, motivates and displays to consumers how to incorporate more plant-based foods into their daily diets.

Thank you for your time, attention and dedication to this critical and relevant public health report.

Sincerely,



Nancy Chapman, RD, MPH
Executive Director

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		Soymilk, original and vanilla, light, with added calcium, vitamins A and D	Soymilk, original and vanilla, with added calcium, vitamins A and D	Milk, lowfat, fluid, 1% milkfat, with added vitamin A and vitamin D	Milk, reduced, fat, fluid 2% milkfat, with added vitamin A	Milk, whole, 3.25% milkfat, with added vitamin D
Calories	<i>Units</i>	73	104	102	138	149
Macronutrients						
Protein	g	5.78	6.3	8.2	9.72	7.69
Total fat	g	1.87	3.57	2.3	4.87	7.93
Saturated fat	g	0.012	0.498	1.54	3.031	4.5
Monounsaturated	g	0.49	0.928	0.67	1.407	1.98
Polyunsaturated	g	1.04	2	0.085	0.182	0.476
Carbohydrates	g	8.53	11.96	12.98	13.51	11.71
Sugars	g	6.34	8.87	12.69	12.94	12.83
Minerals						
Calcium	mg	299	299	305	352	276
Iron	mg	1.04	1.02	0	0	0
Magnesium	mg	36	36	27	39	24
Phosphorus	mg	211	104	232	276	205
Potassium	mg	284	296	366	448	322
Sodium	mg	117	114	107	145	105
Zinc	mg	0.56	0.63	1	1.11	0.9
Copper	mg	0.2	0.4	0.024	0.02	0.061
Manganese	mg	5.6	0.151	0.007	0.005	0.01
Selenium	mcg	7	5.6	8.1	6.4	9
Vitamins						
Vitamin C	mg	0	0	0	2.7	0
Thiamin	mg	0.09	0.07	0	0	0
Riboflavin	mg	0.488	0.447	0.49	0.45	0.5
Niacin	mg	0.539	1.03	0.227	0.2	0.3
Panthenic acid	mg	1.4	0.253	0.881	0.869	0.9
Vitamin B6	mg	0.039	0.075	0.09	0.093	0
Folate	mcg	22	22	12	12	12
Vitamin B12	mcg	2.43	2.07	1.15	1.29	1
Vitamin A	IU	496	450	478	464	249
Vitamin E	mg	0.15	0.02	0	0	0
Vitamin D	IU	114	104	117	120	99
Vitamin K	mcg	5.4	7.3	0.2	0.5	0.5

[1] USDA National Nutrient Database for Standard Reference, Release 22.

Accessed at <http://www.nal.usda.gov/fnic/foodcomp/search/> on 7/13/10

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Table 2: The Nutrient Content of Soyfoods and their Complimentary Animal-Based Products

The Nutrient Content of Soyfoods and their Complimentary Animal-Based Products																				
Food Item	Serving Size**	Kcal	Pro	Fat	Sat Fat	Carb	Chol	Fiber	Iron	Ca	B6	B12	Folate	Mg	Zn	K	Na	Vit A	Vit C	Vit D
Tofu (1)	1/4th block (81g)	117	12.8	7	0	3	0	2	2.1	553	0.1	0	23	47	1.27	192	11	134	0.2	0
Nasoya Tofu (2)	79g	77	8	4	0.5	2.8	0	1	1.3	61	N/A	N/A	N/A	N/A	N/A	N/A	3	29	N/A	N/A
Eggs (3)	1 large egg (50 g)	72	6.3	5	2	0	212	0	0.9	25	0.07	0.7	24	6	0.6	67	70	244	0	0.6
Soy cheese chunks (4)	1 oz (28g)	66	7	3	0	2	0	1	<0.5%	235	0	0	0	19	0	6.3	190	<0.5%	<0.5%	0
Cheese (5)	1 oz (28g)	94	5.6	6.7	4	2	18	0	0.06	141	0.04	0.36	1	9	0.9	103	274	200	0	N/A
Soy yogurt, vanilla (6)	6 oz	150	8	5	0	37	0	3	2.3	400	0	0	0	88	0.07	N/A	25	0	0	N/A
Yogurt, vanilla, low-fat (7)	8 oz (245g)	208	12	3	2	34	12	0	0.2	419	0.1	1.3	27	39	2	537	162	105	2	0
Tofurky franks (8)	1 frank (45g)	80	11	2	0	5	0	3	0.72	20	N/A	0.2	N/A	12.9	0.86	139	390	0	0	N/A
Frankfurters (9)	1 frank (45g)	148	5	13	5	2	24	0	0.7	6	0.04	0.77	2	6	1.1	0	513	0	0	0.4
Tofurky, deli slices (10)	2 oz (52 g)	100	13	3	0	6	0	3	1.1	20	0.05	0.09	7.8	19.9	0.68	69	300	0	0	N/A
Turkey breast, roast (11)	2 oz (56g)	56	10	1	0	2	22	0	0.6	4	N/A	N/A	N/A	20	0.5	146	514	0	0	N/A
Westsoy Tempeh Original (12)	1/3 block (76g)	160	16	7	1	9	0	3	1.8	80	0.9	0.1	16	58.5	1.2	304	10	0	0	N/A
Hamburger patty (13)	1 patty (83g)	204	20	13	5	0	71	0	2.1	21	0.3	2.2	7.5	17.4	5	278	69	0	0	0.2
Tofurky Italian Sausage (14)	100g	270	29	13	1.5	12	0	8	2.7	40	0.1	0.09	13.7	51.6	1.7	257	620	300	0	NA
Italian Sausage (15)	1 link (83g)	286	16	23	8	4	47	0	1.2	17	0.27	1.08	4	15	1.98	252	1002	13	0.1	0.8

**Serving size is the equivalent of 2 oz of lean meat

- 1 Based on USDA National Nutrient Database for Standard Reference Release #22 for tofu, raw, firm, prepared with calcium sulfate
- 2 Based on USDA National Nutrient Database for Standard Reference Release #22 for Vitasoy USA, Organic Nasoya Extra Firm Tofu
- 3 Based on USDA National Nutrient Database for Standard Reference Release #22 for Egg, whole, raw, fresh
- 4 Based on nutrient information from Lisanatti Cheese for Soy-Sation cheddar chunks
- 5 Based on USDA National Nutrient Database for Standard Reference Release #22, for Cheese food, cold pack, american
- 6 Based on nutrient information from WholeSoy for WholeSoy vanilla yogurt
- 7 Based on USDA National Nutrient Database for Standard Reference Release #22 for Yogurt, vanilla, low-fat (8 fl oz)
- 8 Based on nutrient information from Tofurky for Tofurky Franks
- 9 Based on USDA National Nutrient Database for Standard Reference Release #22 for Frankfurter, beef
- 10 Based on nutrient information from Tofurky for Tofurky Deli Slices
- 11 Based on USDA National Nutrient Database for Standard Reference Release #22 for LOUIS RICH, Turkey Breast and White Turkey (oven roasted)
- 12 Based on nutrient information from Westsoy Tempeh, cooked
- 13 Based on USDA National Nutrient Database for Standard Reference Release #22 for beef, ground, 80% lean meat / 20% fat, patty, cooked, pan-broiled
- 14 Based on nutrient information from Tofurky for Tofurky Italian Sausage
- 15 Based on USDA National Nutrient Database for Standard Reference Release #22 for Sausage, Italian, pork, cooked