

# Defining “Protein” Foods

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Changing the name of the “protein foods” group on the US Department of Agriculture’s visual food guide, MyPlate, back to the “meat & beans” group would provide important clarification regarding US Department of Agriculture recommendations for a balanced diet. Previous iterations of the food guide named the protein group after its constituent foods (ie, the “meat & beans” group on the 2005 MyPyramid), and the reasons for renaming the entire group with MyPlate are unclear.

The exclusion of dairy foods from the “protein foods” group of the 2010 MyPlate illustrates the shortcomings of this group’s name. Dairy foods contain high-quality, affordable protein and constitute a significant portion of the protein intake among the US population but are not listed as “protein foods” on MyPlate. Dairy products and other high-calcium foods do have their own section of MyPlate; however, having this separate group does not mitigate the disingenuousness of having a “protein group” that excludes an important protein source. In addition, because consumers tend to understand food-based terms better than nutrient-based terms, a change to “meat & beans” group would also provide clarification for consumers and for educators regarding the content and role of this group. *Nutr Today*. 2016;51(3):117–120

Changing the name of the “protein foods” group on the US Department of Agriculture’s (USDA’s) visual food guide, MyPlate, back to the “meat & beans” group would provide important clarification regarding USDA recommendations for a balanced diet. The name “protein foods” is confusing because this group

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Ms Hess has no conflicts of interest to disclose. Dr Slavin serves on the Scientific Advisory Board for the Midwest Dairy Association. She also owns a 1/3 share of Slavin Sisters LLC, a 119 acre farm in Wisconsin. The farm is currently leased and corn and soybeans are currently grown on the land.

Dr Slavin provided funding to allow this article to publish as Open Access.

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DOI: 10.1097/NT.0000000000000157

excludes protein-rich dairy foods and its name refers to a nutrient instead of foods.

Dairy foods, an important source of high-quality, affordable protein for Americans,<sup>1–3</sup> are not included in this group.<sup>4</sup> Although dairy has its own section of MyPlate, this section focuses primarily on the calcium content of dairy foods, not their protein content.<sup>5</sup> Because dairy foods constitute a substantial portion of protein consumed by the US population,<sup>1,2</sup> they belong in a group titled “protein foods.” Yet the nutrient profile of dairy foods is markedly different from the profiles of the current “protein foods” such as meat, legumes, poultry, and eggs (Table 1). While adding dairy foods to the current “protein foods” group could displace important nutrients such as iron and B vitamins, leaving dairy foods out of the protein group downplays their considerable protein quality. Renaming the “protein foods” group to reflect its constituent foods would clarify this inconsistency.

In addition, renaming the “protein foods” the “meat & beans” group would aid consumer understanding of MyPlate. Historically, groups on the USDA food guides have been named after foods instead of nutrients,<sup>7</sup> and consumers understand this food-based terminology better than nutrient names.<sup>8</sup> MyPlate is intended for consumer use and education and needs to contain accurate information that is accessible and understandable to consumers.

## DAIRY FOODS

### Protein Content, Quality, and Role in the American Diet

By excluding dairy, the “protein foods” group name of MyPlate neglects the contribution of dairy foods to protein intake in the United States. For many Americans, dairy is an important dietary staple and major source of protein.<sup>1,2</sup> Milk is the primary source of protein for children aged 2 to 18 years, comprising 13.2% of the total protein this group consumes.<sup>1</sup> Among Americans aged 19 to 50 years, cheese and milk are the third and fourth most common food sources of protein, respectively.<sup>2</sup> Milk also provides 7.4% of protein for adults older than 51 years<sup>2</sup> and is among the top 5 sources of dietary protein for Americans along with poultry, meats, mixed dishes (meat, poultry, fish), and bread.<sup>9</sup> Yet, whereas poultry, meats, and fish are included in the “protein foods” group, bread and milk are not. Bread and milk do contain less protein per gram than poultry, meats, and fish. Grilled chicken breast meat has approximately 31 g of protein in every 100 g, and cooked ground beef (90% lean)

**TABLE 1** Micronutrient Differences Between Dairy Foods and “Protein Group” Foods

Nutrients	Micronutrients per 100 g <sup>6</sup>		
	Milk <sup>a</sup>	Beef <sup>b</sup>	Beans <sup>c</sup>
Calcium, mg	125	13	73
Iron, mg	0.03	2.71	2.99
Magnesium, mg	11	22	51
Niacin, mg	0.1	5.66	0.113
Potassium, mg	150	333	454
Riboflavin, mg	0.19	0.176	0.037
Thiamin, mg	0.02	0.04	0.1
Vitamin A, IU	196	9	0
Vitamin D, IU	48	2	0
Vitamin E, mg	0.01	0.12	0.79
Zinc, mg	0.42	6.37	1.12

<sup>a</sup>Milk: 1% milk fat, with added vitamin A and vitamin D.  
<sup>b</sup>Beef: ground, 90% lean, 10% fat, patty, cooked, broiled.  
<sup>c</sup>Beans: white, mature seeds, canned.

has 26 g of protein in every 100 g of beef.<sup>6</sup> Yogurt and milk, on the other hand, both contain slightly more than 3 g of protein in every 100 g, and wheat bread has roughly 11 g of protein per 100 g.<sup>6</sup> However, protein amount does not reflect protein quality. Protein sources contain different combinations of amino acids and are not equally digestible. While wheat bread contains protein, for instance, it does not contain lysine, 1 of 9 essential amino acids, and scores low on “protein digestibility.”<sup>10</sup> Milk, on the other hand, is among the best protein sources. It contains all 9 essential amino acids in a bioavailable and digestible form.<sup>11,12</sup> According to the most common protein quality evaluation measure, the Protein Digestibility Corrected Amino Acid Score (PDCAAS), milk protein has a value of 1.00, the highest possible quality rating on this scale.<sup>10</sup> Historically, protein quality evaluation measures have even used milk protein as a reference to measure the quality of other proteins against.<sup>10,11</sup> The PDCAAS scoring evaluates protein quality based on limiting amino acids, fecal digestibility, and the protein needs of preschool-aged children.<sup>10</sup> Yet, because this scale truncates scores greater than 1.00, it still cannot fully reflect the quality of the protein that milk contains. Milk’s “true” PDCAAS score is 1.21, but because its concentration of some indispensable amino acids is higher than the amount of those amino acids required by preschool aged children, its value is

truncated to 1.00. However, the value of 1.00 versus 1.21 is relevant only in the context of a milk-only diet. As soon as other protein sources are added, which may be deficient in amino acids of which milk has an overabundance, milk can complement those deficient protein sources. Most diets contain a variety of foods, so milk’s nontruncated PDCAAS score may more accurately reflect the quality of dairy protein. Table 2 lists the PDCAAS values for common protein group foods, as well as for wheat and milk. Milk has a PDCAAS value higher than either ground beef or soy, and its nontruncated value is even higher than that of eggs.<sup>12</sup> According to the PDCAAS scale, dairy is a source of excellent protein.

**Cost of Dairy Protein and Importance for Vulnerable Populations**

In addition, dairy protein is more affordable than some other “protein foods.” Generally, protein tends to be more expensive than other sources of calories.<sup>3</sup> Animal protein, which is of higher quality than plant protein, is one of the most expensive foods besides produce.<sup>3</sup> A 2010 study assessed foods from the USDA Food and Nutrition Database and the USDA Center for Nutrition Policy and Promotion’s food price database for the nutrient value of foods relative to their cost using the Nutrient Rich Foods Index.<sup>3</sup> This index was used to rate the nutrient density of individual foods by assessing the presence of nutrients to encourage (defined as protein, fiber, vitamin A, vitamin C, vitamin E, calcium, iron, magnesium, and potassium) versus nutrients to limit (added sugars, sodium, and saturated fat).<sup>3</sup> In this study, eggs and milk were among the lowest-cost sources of vitamin A, dietary calcium, vitamin B<sub>12</sub>, and riboflavin (*P* < 0.01). Eggs and milk were also among the least expensive protein sources.<sup>3</sup> However, whereas eggs are considered “protein foods” on MyPlate, dairy foods are not. The lower cost of dairy protein could have important ramifications for vulnerable populations, such as children and older adults, who have high protein needs. While the

**TABLE 2** Protein Quality of Foods as Indicated by Protein Digestibility Corrected Amino Acid Score Values

Protein Source	Protein Digestibility Corrected Amino Acid Score (Nontruncated Score)
Egg	100 (118) <sup>12</sup>
Ground beef	92 <sup>12</sup>
Milk	100 (121) <sup>12</sup>
Soy	91 <sup>12</sup>
Wheat	42 <sup>12</sup>

recommended dietary allowance (RDA) of protein for adults is 0.8 g/kg body weight, the RDA for children aged 1 to 14 years ranges from 1.00 to 1.14 g/kg.<sup>13</sup> Although not reflected in the RDAs, elderly members of the population may also need more than 0.8 g/kg of protein to slow the loss of muscle tissue and function because of aging.<sup>14</sup> While protein intake is sufficient for most of the population, the 2015 Dietary Guidelines Advisory Committee noted in their report that “6% of men older than 80 years and 11% of women older than 80 years had protein intakes that were below the protein [estimated average requirement].”<sup>15</sup> Because older adults also have lower energy needs and tend to consume less protein,<sup>14</sup> it is especially important for this group to select foods with high-quality protein.

### WHY NOT ADD DAIRY TO THE PROTEIN GROUP?

Because of their high-quality protein content and contribution to the protein intake of Americans, dairy foods are “protein foods.”<sup>15,16</sup> However, dairy does not belong with the other “protein foods,” because of its very different nutrient profile. In addition, dairy has its own section of MyPlate.<sup>17</sup>

In addition to protein, dairy contains calcium, vitamin D, and potassium, 3 of the nutrients of concern identified in the 2015 Dietary Guidelines for Americans (2015 DGA).<sup>16</sup> However, dairy does not contain iron, niacin, vitamin E, or vitamin B<sub>6</sub> like meat, poultry, beans, eggs, fish, and nuts and seeds do.<sup>18</sup> Therefore, although dairy foods are considered a food group to increase in the 2015 DGA,<sup>16</sup> adding dairy to the “protein foods” group could result in nutrient displacement if dairy overtakes other sources of protein in the diet.

Furthermore, dairy already has its own unique section on MyPlate. In this section, daily consumption of 2 to 3 cups of dairy products is recommended primarily to encourage adequate calcium intake. The only dairy foods included in this group are those dairy products that “retain their calcium” after processing, such as milk, cheese, and yogurt.<sup>5</sup> The dairy group also encompasses nondairy sources of calcium, including calcium-fortified foods (juices, soymilk, cereals), canned fish, tofu, and leafy greens.<sup>19</sup>

### NUTRIENTS VERSUS FOODS: HISTORICAL PRECEDENCE AND CONSUMER EDUCATION

Dairy foods are “protein foods” but differ considerably from the foods currently in the “protein foods” group. MyPlate is the first US food guide to name a major food group with a nutrient.<sup>7</sup> The historical precedent has been to label all food groups by their constituent foods. As shown in Table 3, the previous names of the “protein foods” group used terminology similar to “meat & beans.” Despite the major name change with MyPlate, the list of foods in this group has hardly changed since 1916 (Table 3). A recent commentary addressing MyPlate myths suggests that this group was renamed to “teach consumers that protein is available in a variety of foods.”<sup>17</sup> If the goal of renaming the former “meat & beans” group was to educate US consumers about the presence of protein in a variety of foods, then dairy, an important source of high-quality protein, would be included in the protein group.

Furthermore, if consumers do not understand what protein is, knowing that different foods contain it is unlikely to be helpful in selecting a healthful diet. Qualitative research used in the development of the 2005 MyPyramid found that consumers had difficulty understanding the differences

**TABLE 3** Shift in “Protein” Group Name in USDA Food Guides Over Time

Food Guide (Year)	Name of “Protein” Group
Hunt Buying Guide (1916)	Meats and other protein-rich food <sup>7</sup>
Stiebeling’s Buying Guide (1930)	Three protein groups (the lean meat, poultry, and fish group, the dry mature beans, peas, and nuts group, and the egg group) <sup>7</sup>
The Basic Seven (1940)	Meat, poultry, fish, eggs, dried beans, peas, nuts <sup>7</sup>
The Basic Four (1958)	Meat group <sup>7</sup>
The Hassle-Free Guide (1979)	Meat, poultry, fish, and beans <sup>7</sup>
The Food Guide Pyramid (1992)	Meat poultry, fish, dry beans, eggs, and nuts group <sup>7</sup>
MyPyramid (2005)	Meat and beans <sup>17</sup>
MyPlate (2011)	Protein <sup>4</sup>

Abbreviation: USDA, US Department of Agriculture.

between nutrients.<sup>8</sup> In focus groups, consumers acknowledged that they did not understand the difference between saturated and unsaturated fats but did understand the difference between “solid fats” and “oils,” which refer more directly to foods.<sup>8</sup> Therefore, explaining nutrition using familiar food-based terminology may be a more effective way for consumers to understand dietary recommendations. The ChooseMyPlate.gov Web site states that its intention is to “to help consumers build healthier diets” with “user-friendly nutrition information.”<sup>20</sup> Yet, the use of “protein” to describe a group of foods instead of using food to describe a group of foods may actually make MyPlate less helpful. Finally, referring to this group of foods by their primary macronutrient also downplays the 2015 DGA’s recommendation to focus on foods, not nutrients, when planning a healthful diet.<sup>16</sup> Focusing on nutrients makes good nutrition more difficult for consumers to understand and implement.<sup>8</sup> Just as the dairy foods group includes a list of “nondairy sources of calcium,” a “meat & beans group” could easily have 1 or more pages describing “other sources of protein” besides meat and beans, such as eggs, seafood, and soy products.

## CONCLUSION

Separating dairy from the rest of the “protein foods” on MyPlate brings into question what exactly a “protein food” is, a topic the MyPlate Web site does not address. Dairy foods include all 9 essential amino acids and contain highly bioavailable and digestible protein, making them “protein foods,” too. The “protein foods” group of MyPlate needs a food-based name. Changing the name of the “protein foods” group to reflect the foods it contains may make it easier to communicate information about proper eating habits to a wider audience with a lack of knowledge about macronutrients. To improve the efficacy of MyPlate as a tool for consumer education, the information it communicates needs to be both evidence-based and easy for both professionals and lay audiences to understand. The former name for the “protein foods” group, the “meat & beans” group, would be an excellent place to start.

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