

# Science, Agriculture, and Nutrition

## The Government Documents that Influenced a Nation's Food and Diet

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Since its creation in 1862, the United States Department of Agriculture (USDA) has published bulletins, reports, pamphlets, posters and a variety of other informational resources. These materials have facilitated the crafting of strategies that have shaped the nutritional standards of the country but also records scientific and technological advances in farming, agriculture and food production. These publications (dating back from the 1800s to the present) help tell the stories of how U.S. federal agricultural policies have advanced the health and welfare of a growing American population.

### Nutritional Guidelines and Dietary Recommendations

For over a century, the United States government has tried to impact the eating habits of its' citizens. The road to U.S. nutritional guidelines and dietary recommendations began in the late 1890s with the federally funded research of Dr. Wilbur Olin Atwater. Atwater, the first director of the Office of Experiment Stations (OES) for the United States Department of Agriculture (USDA), published *Principles of Nutrition and Nutritive Value of Food* as a farmer's bulletin in 1902 (the bulletin was reissued in 1910 with corrections and without change in 1916).<sup>1</sup> His studies focused on the composition and preparation of food, digestion, and fats, proteins and carbohydrates as well as other food related topics. His notions on the dangers of the one sided diet, the needless use of expensive food and the advantage of having several moderate meals a day remain similar to the views of today in relation to proper eating habits and nourishment.

Atwater's research on food composition and nutrition, paved the way for the USDA's first food guide, 1916's *Food for Young Children*, by Caroline Hunt, a Scientific Assistant in the USDA's Office of Home Economics.<sup>2</sup> *Food for Young Children* included meal plans and recipes for dishes such as meat stews, tapioca and rice pudding, milk toast and coddled eggs. Furthermore, the publication divided food into five food groups with a daily

serving suggestion of food from each group, as Hunt states, "A little child who is carefully fed in accordance with his bodily needs (as these are now understood) receives every day at least one food from each of the following groups:

1. Milk and dishes made chiefly of milk (most important of the group as regards children's diet); meat, fish, poultry, eggs, and meat substitutes.
2. Bread and other cereal foods.
3. Butter and other wholesome fats.
4. Vegetables and fruits.
5. Simple sweets."<sup>3</sup>

Hunt and Helen W. Atwater would go on to collaborate and *How to Select Foods* appeared in 1917.<sup>4</sup> Akin to its' predecessor, *How to Select Foods* had dietary recommendations based on the same five food groups in *Food for Young Children* but its' advice was aimed at the general population instead of individuals between the ages of three to six and its' suggestions would remain in effect through the 1920's. In the early 1930s, due to the monetary limitations because of the Great Depression, Hazel Stiebeling (who would later become the Bureau Chief of the USDA's Bureau of Human Nutrition and Home Economics) created USDA Circular No. 296, *Diets at Four Levels of Nutrition Content and Cost*.<sup>5</sup> The Circular identified four different food plans at four cost levels outlined by twelve major food groups to buy and use to meet a week worth of nutritional goals.<sup>6</sup>

### The Food Pyramid

World War II lifted the United States out of its' economic troubles but the nation's food supply would have to be cautiously allocated in order to guarantee soldiers serving on the front lines would have proper nutrition.<sup>7</sup> In 1943 the USDA released the Basic Seven food guide as the leaflet, *National Wartime Nutrition Guide* (revised as the *National Food Guide* in 1946)

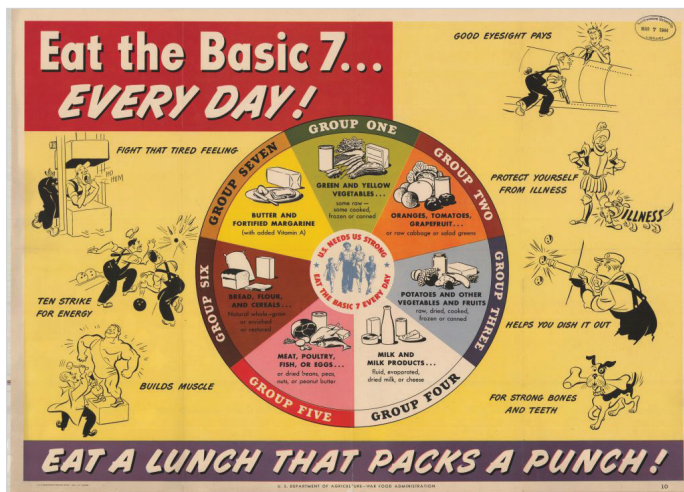


Figure 1. The Basic Seven Food guide

to help maintain nutritional standards under wartime rationing.<sup>8</sup> As a part of the War effort eating healthily and conserving food became a patriotic duty for the civilian population. Nutritional information that was found in circulars, bulletins and leaflets now would be shared visually to encourage compliance with new dietary standards.<sup>9</sup> The poster that introduced the Basic Seven food group to the populace was colorful and consisted of a circle similar to a pie chart and each of the pie pieces include the names and a graphic representation of one of the food groups introduced in the food guide. The food groups were:

1. Green and yellow vegetables
2. Oranges, tomatoes, grapefruit
3. Potatoes and other vegetables and fruits
4. Milk and milk products
5. Meat, poultry, fish, or eggs
6. Bread, flour, and cereals
7. Butter and fortified margarine

The center of the poster depicted a family and the slogan “U.S. Needs Us Strong . . . Eat The Basic 7 Everyday”; equating good citizenship with healthy eating habits (see figure 1).<sup>10</sup>

The USDA and the U.S. Department of Health and Human Services (HHS) joined forces in 1978 and appointed a task force of scientists from their two agencies to develop nutritional guidance statements to advise the public about current knowledge of the relationship between diet, health and disease; this would eventually lead to the 1980 joint release of the USDA’s and HHS’ first edition of *Nutrition and Your Health: Dietary Guidelines for Americans*.<sup>11</sup> *Nutrition and Your Health: Dietary Guidelines for Americans* was a brochure of 7 dietary guidelines statements that was partly based on the 1979 *Surgeon General’s*

*Report on Nutrition and Health* and has been released jointly by both agencies every five years since its original appearance in 1980.<sup>12</sup>

In 1992, the USDA released the Food Guide Pyramid ([www.cnpp.usda.gov/fgp](http://www.cnpp.usda.gov/fgp)). This became a generally acknowledged nutrition education tool which sought to express the types of food to eat each day and the recommended servings of those foods. It was divided into six horizontal segments containing depictions of foods from each segment’s food group. The Bread, Cereal, Rice & Pasta Group was the base of the Pyramid with the suggestion of 6–11 servings a day. The middle of the Pyramid consisted of the Fruit Group with 2–4 servings on the right and on the left the Vegetable Group with a daily serving of 3–5. The last two groups that were located at the top of the Pyramid were the Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts and the Milk, Yogurt & Cheese which both had a serving suggestion of 2–3. The tip of the Pyramid was reserved for Fats, Oils, & Sweets which were to be used sparingly (see figure 2).<sup>13</sup>

The USDA Food Pyramid was updated in 2005 and renamed MyPyramid ([www.cnpp.usda.gov/mypyramid](http://www.cnpp.usda.gov/mypyramid)). Gone were the horizontal sections with food and serving size suggestion. They were replaced with colorful vertical wedges of orange,

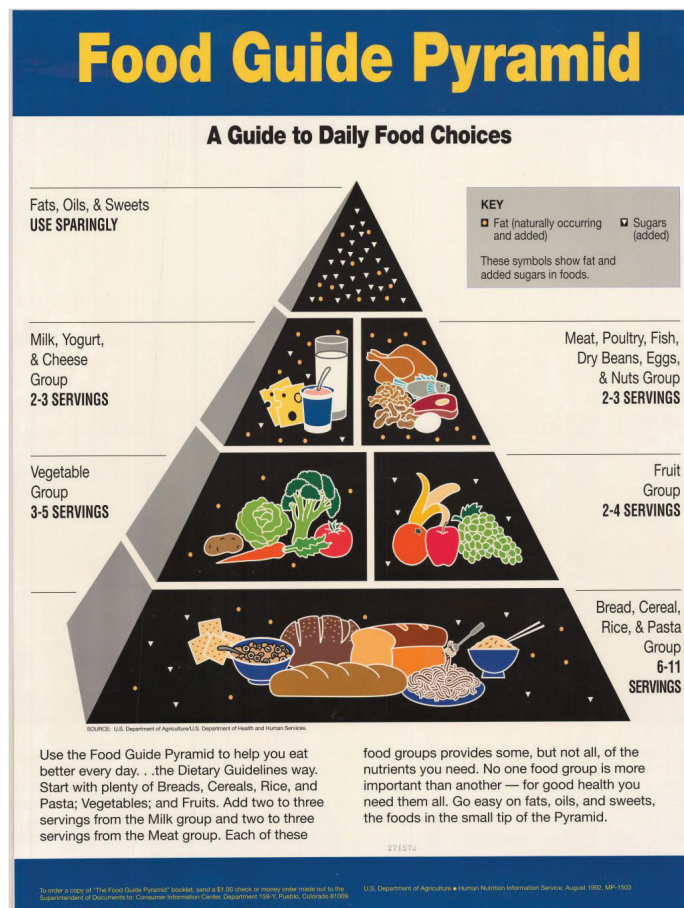


Figure 2. The 1992 Food Pyramid

green, red, yellow, blue and purple with the depiction of the different food groups at the bottom of the pyramid. The new food groups became: Grains, Vegetables, Fruits, Milk & Meats and Beans. Stairs were added to the left side of the pyramid with an image of someone climbing them to represent exercise and food intake recommendations were no longer measured in servings but the common household measurements cups and ounces. Additionally, different posters were created for pregnant and nursing mothers, preschoolers and kids (see figures 3 and 4).

On June 2, 2011, First Lady Michelle Obama, USDA Secretary Tom Vilsack and Surgeon General Regina Benjamin released the federal government's new food pyramid, which was not a pyramid but a plate; specifically MyPlate (www.choosemyplate.gov/). MyPlate's intent was to inspire healthy eating by aiding in building a healthy plate at meal times. It is divided into four distinct grids, with fruits and vegetables taking up half of the plate, and grains and protein making up the other half. The program is supposed to be easier to understand by stressing the importance of fruit, vegetable, grains, protein, and dairy groups and instead of emphasizing serving sizes one can use the sections of the plate to create well-balanced meals which translates to a well-balanced diet.

### Science and Technology

The USDA's and its bureaus had an additional focus beyond nutrition, they also produced a wealth of materials related to innovations in science and technology; documenting research and development advances from breeding improved food animals, hybridizing insect and climate tolerant crops, advancing agricultural machinery and buildings, to creating techniques for land conservation, preserving and shipping food and determining nutritional benefits for the American consumer.

For example, the USDA's Natural Resources Conservation Service has national responsibility for helping America's farmers, ranchers, and other private landowners develop and carry out voluntary efforts to conserve and protect our natural resources.<sup>14</sup> Two of their documents *First Things First: A Call for Immediate Enlistment in Soil Conservation* (1943) and *Buffer Strips: Common Sense Conservation* (1997) promote using the techniques of contour plowing on sloping cropland and creating vegetative buffer-strips near waterways to limit soil erosion, while *Victory Garden Insect Guide* (1944) from the Extension Service and Bureau of Entomology and Plant Quarantine describes a selection of insects that feed on garden crops and methods to control them.<sup>15</sup> The dissemination of this information was part of a critical effort during WWII to maximize the number of productive and healthy victory gardens growing food in support of the nation and the war.

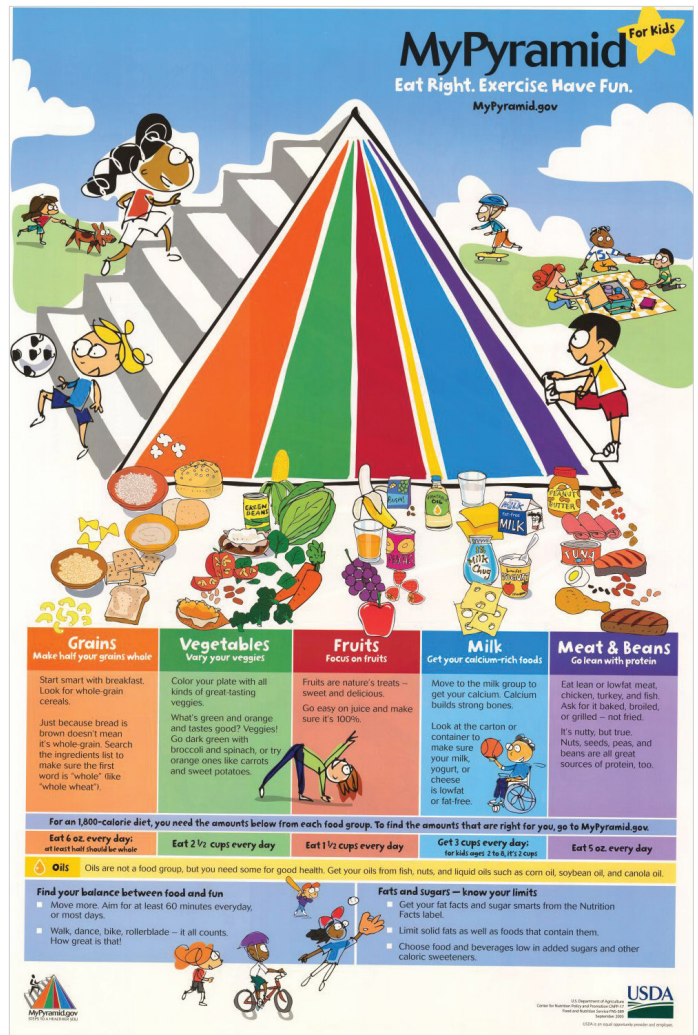


Figure 3. My Pyramid for Kids (side 1)



Figure 4. My Pyramid for Kids (side 2)

Of course, like most government documents, USDA materials are not solely limited to the print format. The 1993 four piece microfiche title, *Always Something New: A Cavalcade of Scientific Discovery* (by the Agriculture Research Service)

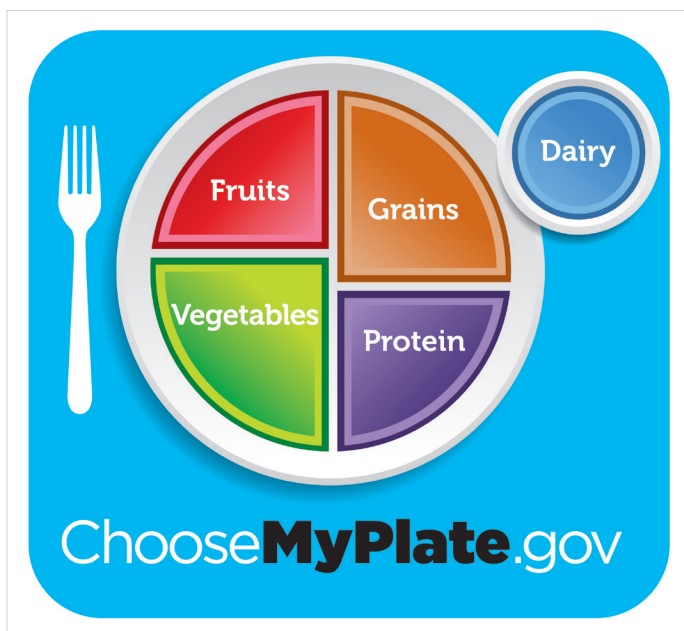


Figure 5. MyPlate

highlights fifty years of crop utilization research conducted at four regional laboratories of the United States Department of Agriculture, and includes the story of Clarence Birdseye inventing and patenting quick freezing techniques for food.<sup>16</sup> The new frozen food industry that emerged from this advance in food preservation was concerned with quality of their products, so they partnered with the USDA's Western laboratory scientists and together developed improvements to the processing of frozen foodstuffs. Another account from this publication details that USDA researchers worked with the Florida Citrus Commission to improve orange concentrate and from this collaboration, the frozen orange juice industry was established.<sup>17</sup>

Historic reports from the USDA not only provides written but also visual information. The plates of the 1866 issue of the *Report of the Commissioner of the Agriculture* illustrate the support of scientific research and technological developments for increasing the yields of U.S. farmers and husbandmen. The improvements to sheep include a sturdier constitution to survive in the environment of the northeastern states which brought more meat to the American table.<sup>18</sup> Progress made and shared about new technologies of the time in the 1867 *Report of the Commissioner of the Agriculture* include the steam plough replacing the power of human and work animals, which was another one of many essential developments in increasing the amount of tillable acreage on American farms which allowed for greater yields and more food produced.<sup>19</sup>

## Conclusion

The Department of Agriculture develops agricultural markets, fights hunger and malnutrition, conserves natural resources, and ensures standards of food quality through safeguards and inspections.<sup>20</sup> Nonetheless, it is also an example of just one of the many U.S. government agencies that in addition to its primary mission, is also charged with conducting research, gathering information and imparting that crucial information to the general public for the purposes of education and decision making that affects the daily lives of the American people.

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