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ORIGINAL ARTICLE

The Identification of Key Foods for Food Composition Research

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The United States Department of Agriculture's (USDA) National Food and Nutrient Analysis Program (NFNAP) was initiated to update existing component values and to add data on new foods and components to reflect today's marketplace and needs for data. The USDA Nutrient Database for Standard Reference contains data for about 6040 foods for over 100 compounds. To develop a full nutrient profile for each food costs approximately $12 000 (six analytical samples × $2000 per sample). To determine food sampling priorities, the Nutrient Data Laboratory (NDL) has used the Key Foods approach to generate a list of 666 foods. This method utilizes existing nutrient profiles and nationally representative food consumption survey data collected by USDA in the Continuing Survey of Food Intakes by Individuals 1994–1996 (CSFII) and by The U.S. Department of Health and Human Services (USDHHS) in the National Health and Nutrition Examination Survey (NHANES). One premise of the project is that more samples will be collected and prepared for those foods which provide important amounts of nutrients of public health significance to the diet and not every sample will be analyzed for all the nutrients currently in NDL's nutrient databases. Even though the list of 666 Key Foods is much more manageable, procedures to set priorities for analysis are still needed. To accomplish this, two approaches were developed. One is based on a point system, and the other on nutrient consumption data. Based on an analysis of the two approaches, the nutrient consumption approach was chosen to be the primary method of selecting foods for analysis. This paper reports details of the two methods to modify the existing Key Foods list to determine new and specific priorities for NFNAP efforts. This program represents a comprehensive approach to collect baseline nationally representative data. Results will be used to update the USDA Nutrient Database for Standard Reference and to establish future priorities for frequency of updates.

Key Words: Key Foods; nutrient analysis; National Food Surveys

INTRODUCTION

The major activity of the USDA's Nutrient Data Laboratory (NDL) is the development of authoritative nutrient databases that contain a wide range of nutrients or food components to support nutrition research, monitoring and policy

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development. USDA's principal food composition product, the Nutrient Data Base for Standard Reference, the successor to the Agriculture Handbook No. 8 series, is the foundation of most public and private sector food composition databases in the United States. In addition, these data will be used to update the nutrient databases used in calculating nutrient intakes in the National Food and Nutrition Surveys conducted by the U.S. Department of Agriculture and U.S. Department of Health and Human Services.

The NDL has used the Key Foods approach to select foods for nutrient analyses for over 10 years (Hepburn, 1987; Haytowitz *et al*., 1996). This approach has allowed NDL to concentrate analytical resources on those foods that contribute significant amounts of nutrients of public health interest to the diet. In 1997 NDL, in cooperation with the National Heart, Lung and Blood Institute of NIH initiated the National Food and Nutrient Analysis Program (NFNAP) to improve the quality and quantity of data in USDA nutrient databases. Determining or setting priorities for the analysis of foods and nutrient, using the Key Foods approach is one of the five principal aims of the NFNAP. Two of the basic premises of the project are that more samples will be collected and prepared for the more important foods and not every sample will be analyzed for all the nutrients currently in NDL's nutrient databases. However, more samples will be analyzed for those foods which provide important amounts of nutrients of public health significance to the diet. The general sampling frame used in this project is described by Pehrsson *et al*. (2000).

Prior to the implementation of NFNAP, data in USDA's National Nutrient Databank came primarily from the food industry, limited USDA-sponsored contracts, and the scientific literature. Except for a number of targeted collaborations, the food industry for the most part provided nutrient data for those 14 nutrients mandated by the U.S. nutritional labeling program. To provide nutrient profiles for over 100 nutrients and other compounds, missing values were imputed by NDL nutritionists and food scientists. Nutrient profiles for other items were calculated from typical recipes or formulations developed by NDL staff. In recent years, fewer scientific articles on the composition of foods have been published, and these seldom keep up with the dynamic nature of the U.S. food supply. Therefore, the NFNAP program was implemented to increase the quantity and quality of data produced by USDA-sponsored contracts. While data from the food industry and the scientific literature remain important sources of information, NFNAP data from USDA-sponsored contracts will comprise a larger portion of the USDA National Nutrient Databank and subsequently its food composition products.

A Key Foods approach was first developed by NDL in the mid-1980s (Hepburn, 1987) using data from the USDA's 1985–1986 Continuing Survey of Food Intakes by Individuals (CSFII) and the 1987–1988 Nationwide Food Consumption Survey. The chief purpose of the first Key Foods list was to identify important foods in USDA's nutrient database which had a high proportion of imputed values. These foods were targeted for analysis during the late 1980s and early 1990s in order to increase the proportion of analytical values in the database. Other investigators have also developed similar lists based on food consumption survey results to select foods for analysis of selenium (Schubert *et al*., 1987), copper (Lurie *et al*., 1989), and carotenoids (Chug-Ahuja *et al*., 1993). The Food and Drug Administration's Total Diet Study also uses USDA food consumption data to identify foods for analysis (Pennington *et al*., 1995).

In the early 1990s, the Key Foods approach was further refined to include the nutrient contribution of ingredients in multi-component foods as well as individual foods (Haytowitz *et al*., 1996). This permitted a more accurate assessment of the nutrient contributions of these ingredients. Earlier approaches assigned a food item

to a food group based on the predominant component, i.e., meat, cereal, vegetable, in the food. For example, a hamburger sandwich would be assigned to the meat group. Therefore, the roll, any vegetables such as lettuce or tomato, and condiments would also be assigned to the meat group along with their respective nutrient contributions. In the refined procedure, the disaggregation of the constituents of multi-component foods allowed them to be apportioned among the various food groups. Using this method with the hamburger sandwich, the hamburger patty is assigned to the meat group, the lettuce and tomato are assigned to the vegetable group, the roll is assigned to the baked products group and so on. Therefore, the nutrient contributions of these ingredients are included in the appropriate food groups.

Using consumption data from the 1994–1996 CSFII (U.S. Department of Agriculture, 1998), a Key Foods list of approximately 600 food items was produced. However, the list itself contained no indicator if any one food provided more nutrients to the diet than others. Consequently, no priorities for analysis of either foods or nutrients within the Key Foods list could be established. To resolve this problem, we developed two new enhancements to the Key Foods approach for setting priorities for the analysis of nutrients in foods. One enhancement is based on a point system, the other on nutrient consumption data.

METHODS

The procedure used to develop the earlier Key Foods list was described in greater detail by Haytowitz *et al.* (1996) using data from the 1989–1991 CSFII (U.S. Department of Agriculture, 1996). The procedure required the calculation of the total amount consumed of each food by the survey population of each food item in the Primary Nutrient Data Set (PDS); the amount of each food consumed was multiplied by the nutrient content of that food to determine the corresponding nutrient contribution. The PDS is a subset of the SR, supplemented with additional foods and nutrients and containing approximately 3100 food items. It is developed by NDL staff and is one of the technical support files used as the basis of the Survey Nutrient Database, which in turn is used to assess the nutrient intake of survey respondents. The USDA Nutrient Data Base for Individual Food Intake Surveys and Food Consumption Data from the 1994–1996 CSFII (USDA-ARS, 1998) and NHANES III, 1988–1994 (USDHHS, 1998) were analyzed to produce a list of Key Foods (Figure 1).

The first step in determining the Key Foods used the list of ingredients and their amounts contained in the ''Recipe File for the USDA Nutrient Data Base for Individual Food Intake Surveys'' (USDA-ARS, 1998) which was used by both surveys. Both surveys used a large recipe file as the basis of the nutrient calculations for foods reported by survey respondents. This file contained those components needed to develop a representative version of each food item and can be either a single item, such as a raw fruit or vegetable or a complex multi-ingredient food, such as a casserole or an ethnic dish. Development of the recipe file was described previously (Perloff, 1985). In the recipe file, ingredient amounts are often expressed in terms of common household units. However, for these calculations all ingredient amounts were first converted to the percent of the total recipe for each food. The 1994–1996 Continuing Survey of Food Intakes by Individuals (USDA-ARS, 1998) provides data on the amount of each food reported as consumed by survey respondents, weighted to represent the amount consumed by the population of the United States for one day. The weighted grams consumed were multiplied by the

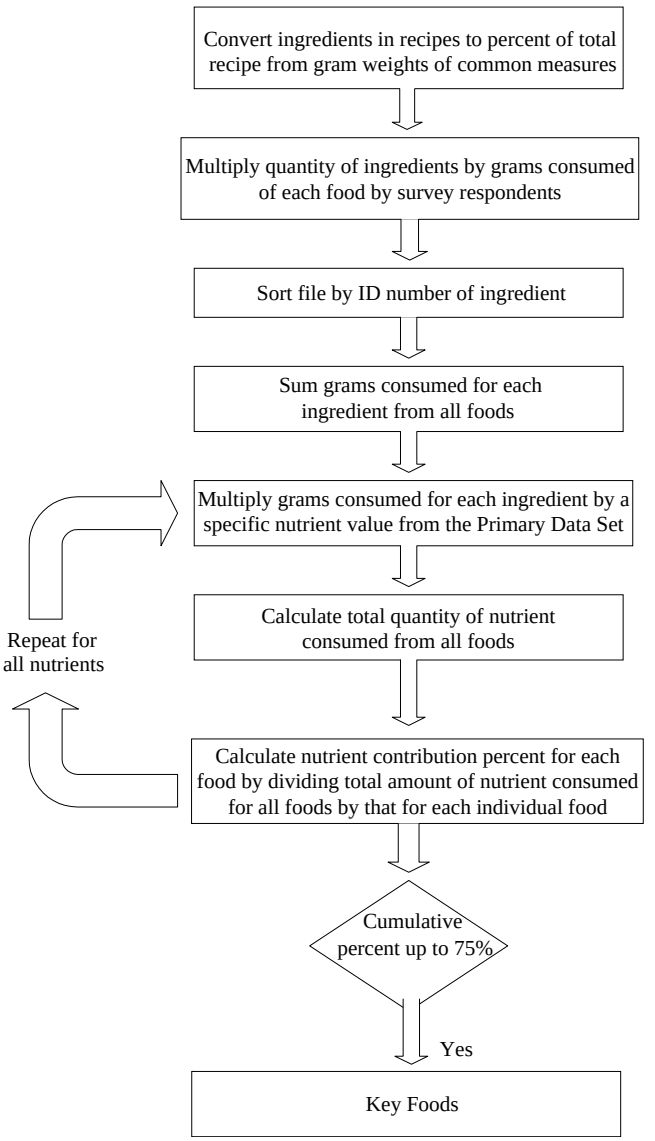

FIGURE 1. Overview of procedure for developing Key Foods List.

percentage contribution of each ingredient in each food to give the total consumption for that day by the population of the United States. This step was repeated for all foods in the recipe file. The amount consumed for each ingredient in all foods was then summed to give the total amount consumed of that ingredient or food.

The Third Scientific Report on Nutrition Monitoring identified 22 nutrients (Table 1) of public health issue or potential public health issue (Life Sciences Research Office, 1995), which were used in the next step of the Key Foods approach. The amount of each ingredient or food consumed was multiplied by the nutrient content in the food to give the nutrient contributions per food for the amount

TABLE 1

Nutrients of current or potential public health issue

Current	Potential
Food energy	Total carbohydrates
Total fat	Dietary fiber
Saturated fatty acids	Sugars[1]
Cholesterol	Polyunsaturated fatty acids
Alcohol[1]	Monounsaturated fatty acids
Iron	Protein
Calcium	Vitamin A
Sodium	Carotenes
	Vitamin E
	Folate
	Vitamin B_6
	Vitamin C
	Magnesium
	Potassium
	Zinc
	Copper
	Phosphorus
	Selenium[1]
	Fluoride[1]

[1]Not included in Key Foods calculations due to limited appearance in foods (alcohol) or limited or no available data (sugars, selenium and fluoride).

consumed by the population. These values were then sorted and ranked from highest to lowest. This step was repeated for all nutrients being examined. Those foods contributing up to a cumulative total of 25% for each nutrient were assigned to the first quartile; those contributing 25–50%, the second quartile; those contributing 50–75%, the third quartile; and those contributing 75–100%, the fourth quartile. Foods in the first three quartiles for each nutrient were defined as the Key Foods. The lists for all 22 nutrients were combined and any duplicates removed to produce a list of 666 individual food items. This compares to 6039 foods in Release 14 of the USDA Nutrient Data Base for Standard Reference (U.S. Department of Agriculture, 2001), almost 7500 foods in the USDA Nutrient Data Base for Individual Food Intake Surveys, and approximately 3100 items in the Primary Data Set. Since many of these single ingredient/simple foods are consumed as part of a mixed dish, this process was repeated for mixed dishes. The major difference in determining a Key Foods list for mixed dishes is that the recipes are not broken down into their composite parts but are evaluated as the whole recipe. Although a particular food may be included on the Key Foods list because of its significant contribution of a single nutrient, almost all foods contribute other nutrients as well. When the contribution of all other nutrients in the foods on the Key Foods list is added to the contribution of those in the top three quartiles, the total contribution of nutrients in the diet from the foods on the Key Foods lists exceeds 90%.

Though the newly generated Key Foods list of 666 items was much more manageable than any of the larger food composition data sets, there was still the need to set priorities for food items and nutrients within the list. As a first effort, the ranked food list for each nutrient was divided into quartiles based on cumulative percent nutrient consumption. However, a single food fell into different quartiles depending on the nutrient of interest, and there was no overall indication of the cumulative importance of any food. Illustrating this problem, the second column of Table 2 shows the quartile assignments for the major nutrients in whole milk. Ten

TABLE 2

Development of scoring for whole milk (NDB No. 01077)

Nutrient	Quartile	Quartile points	Consumption points
Protein	1	10	334.324
Fat	1	10	346.936
Energy	1	10	235.345
Fiber	4	0	0.000
Calcium	1	10	1133.369
Iron	2	5	24.887
Magnesium	1	10	386.914
Phosphorus	1	10	580.662
Potassium	1	10	439.613
Sodium	2	5	107.077
Zinc	1	10	259.018
Copper	2	5	65.035
Vitamin A	2	5	151.124
Vitamin E	2	5	97.385
Vitamin C	3	1	71.354
Folate	2	5	143.113
Cholesterol	2	5	413.245
Total saturated FA	1	10	624.810
Total monounsaturated FA	1	10	262.170
Total polyunsaturated FA	3	1	66.331
Total points		137	5742.714

TABLE 3

Top 10 single ingredient/simple foods using point scoring in the Key Foods approach

NDB no.	Description	Score[1]	1st Quartile nutrients
01077	Milk, whole	137	Protein, fat, energy, Ca, Mg, P, K, Zn, SFA, MFA
01079	Milk, 2%	133	Protein, fat, energy, Ca, Mg, P, K, Zn, SFA
18350	Rolls, hamburger or hot dog	125	Protein, energy, TDF, Fe, Mg, Zn, Cu, folate,
01123	Eggs, whole, fresh and frozen	113	Protein, Fe, P, Zn, cholesterol, MFA
21138	Potatoes, French fried	109	Fat, energy, TDF, Mg, K, Cu, MFA
18069	Bread, white	108	Protein, energy, TDF, Fe, Cu, Folate
13312	Beef, ground, regular, medium done	100	Protein, fat, energy, Fe, Zn, SFA, MFA
01046	Cheese food, pasteurized processed, American	95	Protein, fat, P, Zn, SFA
19411	Potato chips, plain, salted	86	Cu
09207	Orange juice	80	Fe, Mg, Cu, Vitamin C, folate

[1]Score based on sum of scores for each nutrient as follows: first quartile nutrients, ten points; second quartile, five points; and third quartile, one point.

nutrients in this food fall in the first quartile: protein, fat, energy, calcium, magnesium, phosphorus, potassium, zinc, total saturated fatty acids and total monounsaturated fatty acids. Obviously, whole milk is a major contributor of a number of nutrients, but there is no indication of how it compares to any other food.

To address this issue, two approaches were developed to provide an overall ranking for each food item (single ingredient food or mixed dish) within the Key Foods list. Though the examples presented are for single ingredient/simple foods, the process is the same for mixed dishes. The first approach involves assigning points to each nutrient in a food, based on their assignment to quartiles: (1) nutrients in the

TABLE 4

Top 10 mixed dish foods using point scoring in the Key Foods approach

Foodcode	Description	Score[1]	1st quartile nutrients
58106520	Pizza with meat, thin crust	190	Protein, fat, energy, TDF, Ca, Fe, Mg, P, K, Na, Zn, Cu, Vitamin A, Vitamin E, Vitamin C, folate, cholesterol, SFA, MFA, PFA
58106720	Pizza with meat and vegetables, thin crust	190	Protein, fat, energy, TDF, Ca, Fe, Mg, P, K, Na, Zn, Cu, Vitamin E, Vitamin C, folate, SFA, MFA, PFA
58132310	Spaghetti with tomato sauce and meat	190	Protein, fat, energy, TDF, Ca, Fe, Mg, P, K, Na, Zn, Cu, Vitamin E, Vitamin C, folate, cholesterol, MFA, PFA
27111410	Chili con carne with beans	185	Protein, fat, energy, TDF, Ca, Mg, P, K, Na, Zn, Cu, Vitamin E, Vitamin C, folate, cholesterol, SFA, MFA
58106530	Pizza with meat, thick crust	185	Protein, fat, energy, TDF, Ca, Fe, Mg, P, K, Na, Zn, Cu, Vitamin E, folate, SFA, MFA, PFA
58106220	Pizza, cheese, thin crust	180	Protein, fat, energy, TDF, Ca, Fe, Mg, P, K, Na, Zn, Cu, Vitamin E, folate, SFA, MFA
58106730	Pizza with meat and vegetables, thick crust	176	Protein, fat, energy, TDF, Ca, Fe, Mg, P, K, Na, Cu, Vitamin E, Vitamin C, folate, SFA, MFA
27510300	Double cheeseburger (2 patties) with mayonnaise or salad dressing on double-decker bun	166	Protein, fat, energy, Ca, Fe, Mg, P, K, Na, Zn, folate, cholesterol, SFA, MFA, PFA
27510560	Hamburger, 1/4 lb. meat, with mayonnaise or salad dressing and tomatoes on bun	157	Protein, fat, energy, Fe, Mg, K, Na, Zn, folate, cholesterol, SFA, MFA, PFA
27111050	Spaghetti sauce with meat	146	TDF, Mg, K, Na, Zn, Cu, Vitamin A, Vitamin E, Vitamin C, PFA

[1]Score based on sum of scores for each nutrient as follows: first quartile nutrients, ten points; second quartile, five points; and third quartile, one point.

TABLE 5

Top 10 single ingredient/simple foods using nutrient consumption scoring in the Key Foods approach

NDB no.	Description	Score[1]	1st quartile nutrients
01077	Milk, whole	5743	Protein, fat, energy, Ca, Mg, P, K, Zn, SFA, MFA, PFA
01079	Milk, 2% fat	5212	Protein, fat, energy, Ca, Mg, P, K, Zn, Folate, SFA
01123	Eggs, whole, fresh and frozen	4901	Protein, Fe, P, Zn, folate, cholesterol, MFA
13312	Beef, ground, regular, medium done	3239	Protein, fat, energy, Fe, Zn, SFA, MFA
18350	Rolls, hamburger or hot dog	3094	Protein, energy, TDF, Fe, Mg, Zn, Cu, folate
02047	Salt, table	2710	Na
04610	Margarine, regular, stick, composite, 80% fat	2704	Fat, energy, Vitamin E, MFA, PFA
09207	Orange juice	2655	Fe, Mg, K, Cu, Vitamin C, folate
01046	Cheese food, pasteurized processed, American	2517	Protein, fat, P, Zn, SFA
11124	Carrots, raw	2480	Vitamin A

[1]Score based on the sum of percent contribution for each nutrient in a food $\times$ 100.

first quartile were given 10 points; (2) in the second quartile, five points; (3) in the third quartile, one point; and (4) in the fourth quartile, no points. The third column of Table 2 shows the point assignments for nutrients of public health significance in whole milk. The points for each nutrient were summed to generate a point score for that food. This was repeated for all foods in the Key Foods list and sorted by score from highest to lowest. The first 10 foods which qualified for the first quartile using the point scoring system and their respective qualifying nutrients are presented in Table 3. Whole and 2% milk lead the list with 137 and 133 points, respectively; this reflects both their high consumption and nutrient density. The impact of fast foods on the American diet is shown by the presence of hamburger rolls, French fried potatoes and ground beef among the top 10 foods. The presence of pasteurized processed American cheese food on the list is probably also attributed to its use in fast food products. Eggs, white bread, potato chips and orange juice complete the list of the top 10 foods. A similar list was developed for mixed dishes (Table 4).

However, the point system does not provide an adequate level of differentiation within a quartile for each nutrient in a food; they all contribute the same number of points. In the case of milk, calcium which contributes 11.33% of the intake for this nutrient get the same number of points as energy which only contributes 2.35% of the intake. Across foods, similar discrepancies can be observed. For example, lettuce provides 3.2% of folate intake, and 2% milk provides 1.5%; both are in the first quartile and are assigned the 10 points.

To address these issues, a second scoring system based on the contribution of each food to total nutrient intake was developed. During the process of developing the Key Foods list, the percent contribution to the total daily intake was calculated for each nutrient. These values were multiplied by 100 and summed to generate a score for a food. For example, whole milk provided 3.34% of the protein intake, 3.47% of the fat intake, and so on. These numbers were multiplied by 100 to give 334 and 347 points, respectively. Complete nutrient consumption scores for whole milk are presented in Table 2. The top 10 foods, sorted in descending order by the nutrient consumption score, are presented in Table 5. Again, whole and 2% milk lead the list with 5743 and 5212 points, respectively. The impact of foods high in a single nutrient is much more prominent using the nutrient consumption scoring system. Salt, a

TABLE 6

Top 10 mixed dish foods using nutrient consumption scoring in the Key Foods approach

Foodcode	Description	Score[1]	1st quartile nutrients
58106520	Pizza with meat, thin crust	5776	Protein, fat, energy, TDF, Ca, Fe, Mg, P, K, Na, Zn, Cu, Vitamin A, Vitamin E, Vitamin C, folate, cholesterol, SFA, MFA, PFA
58132310	Spaghetti with tomato sauce and meat	3580	Protein, fat, energy, TDF, Ca, Fe, Mg, P, K, Na, Zn, Cu, Vitamin E, Vitamin C, folate, cholesterol, MFA, PFA
27111410	Chili con carne with beans	3030	Protein, fat, energy, TDF, Fe, Mg, P, K, Na, Zn, Cu, Vitamin E, Vitamin C, folate, cholesterol, SFA, MFA
58106530	Pizza with meat, thick crust	2995	Protein, fat, energy, TDF, Ca, Fe, Mg, P, K, Na, Zn, Cu, Vitamin E, folate, SFA, MFA, PFA
58106720	Pizza with meat and vegetables, thin crust	2680	Protein, fat, energy, TDF, Ca, Fe, Mg, P, K, Na, Zn, Cu, Vitamin E, Vitamin C, folate, SFA, MFA, PFA
58106220	Pizza, cheese, thin crust	2423	Protein, fat, energy, TDF, Mg, K, Na, Zn, Cu, Vitamin E, folate, SFA, MFA
27111050	Spaghetti sauce with meat	2103	TDF, Ca, Fe, Mg, P, K, Na, Zn, Cu, Vitamin A, Vitamin E, Vitamin C, PFA
27510300	Double cheeseburger (2 patties), with mayonnaise or salad dressing, on double-decker bun	2045	Protein, fat, energy, Ca, Fe, Mg, P, K, Na, Zn, folate, cholesterol, SFA, MFA, PFA
58132110	Spaghetti with tomato sauce, meatless	2035	Energy, TDF, Fe, Mg, K, Na, Cu, Vitamin E, Vitamin C, folate
27510560	Hamburger, 1/4 lb meat, with mayonnaise or salad dressing and tomatoes, on bun	2032	Protein, fat, energy, Fe, Mg, K, Na, Zn, folate, cholesterol, SFA, MFA, PFA

[1]Score based on the sum of percent contribution for each nutrient in a food $\times$ 100.

significant source of sodium, and carrots, a significant source of vitamin A, moved into the top 10. The high fat level of margarine, as well as the levels of other related nutrients moved this food into the top 10 foods. A similar list, using the same techniques, was developed for mixed dishes (Table 6).

DISCUSSION

For most foods, the lists generated by both the point scoring and the nutrient consumption scoring approaches are quite similar. However, the ranking of certain foods which contain large amounts of a specific nutrient appear much higher on the nutrient consumption scoring list than on the point scored list. A clear example is salt which moved from the 179th position in the point scoring list to 6th in the nutrient consumption scoring list based on its frequent consumption and very high sodium content. In fact, the sodium accounted for almost all of its points (2687 out of 2701 points or 99%). Another less pronounced example is raw carrots, which moved from the 65th position in the point scoring list to 10th in the consumption scoring list because of its high vitamin A content (2101 out of 2480 points or 85%). The relative ranks of other foods as determined by the two approaches tended to be more similar. For example, eggs moved from 4th to 3rd when the nutrient consumption scoring for cholesterol contribution was used instead of the point system (2466 of 4901 points or about 50% versus 10 of 113 points or about 9%).

Both scoring systems were applied to the mixed dish Key Foods. The top 10 foods in this list using the point scoring system are presented in Table 4. Five types of pizza dominate the top 10 mixed dishes. Hamburgers, most likely purchased in fast food restaurants, tomato products and chili con carne complete the top 10 foods. This process was also repeated using the nutrient consumption scoring system (Table 6). Again, various types of pizza are prominent on the list, providing four entries in the top 10. Three spaghetti items, two types of hamburgers, and chili con carne once again complete the top 10 for the list.

Fewer differences are observed between the two lists for mixed dishes. Nine of the foods are found on both lists shown in Tables 4 and 6. Pizza with meat and vegetables, thick crust, is found only on the point scoring lists, while spaghetti with tomato sauce is found only on the nutrient consumption scoring list. Since foods (e.g., salt and carrots) or ingredients which have high levels of a single nutrient (e.g., sodium and vitamin A) were part of the mixed dish, this particular difference between the two scoring systems was not seen with the mixed dishes. The complete Key Foods list for both individual foods and mixed dish items is available on the Nutrient Data Laboratory Web site: http://www.nal.usda.gov/fnic/foodcomp.

CONCLUSION

As a result of this investigation, we are using the nutrient consumption scoring approach in preference to the point scoring approach to determine foods and nutrients for analysis. The nutrient consumption scoring approach provides an adequate level of differentiation for each of the nutrients in a food within a quartile. While some foods containing a large amount of a single nutrient (e.g., sodium in salt) can skew the list, the Key Foods approach is not the sole factor in selecting foods for analysis. The nutrient consumption scoring system allows us to look at each food as a contribution of many components, i.e., the 22 nutrients used in this evaluation. In view of the cost of analyzing foods, it is important to note that a relatively short list

of foods contributes significant amounts of the nutrients of public health significance for a nationally representative population. Of the 666 Key Foods identified, 14 are in the first quartile, 42 in the second, 126 in the third and 484 in the fourth quartile. Our goal is to obtain representative analytical data for all of these foods. Given their relative importance in the diet, more sample units will be collected for foods in the first quartile and more composite samples will be generated for analysis. Each composite will be analyzed for all of the nutrients of public health significance; a subset of the composites will be analyzed for other nutrients. For foods in the remaining quartiles, fewer samples will be collected and fewer composites generated for nutrient analyses. To date, over 300 foods consumed by the general U.S. population have been selected, sampled and analyzed under this program. In addition to the 666 Key Foods, mixed dishes, ethnic foods, ingredients and foods used in clinical studies have been identified for analysis, generating a final list of 1000 foods to be analyzed under NFNAP.

This list was based on a nationally representative survey of food consumption patterns for the population of the United States. To ensure that we identify foods which may make a significant contribution to the diets of important population subgroups, we have developed Key Foods lists for each of these groups. To date, we have included African–Americans and American Indians/Alaska Natives, children and the elderly.

The Key Foods approach is being used to identify foods consumed by American Indians and Alaska Natives as the first step in developing a separate food composition database for this ethnic group. However, the population sample size in the nationwide surveys was too small to produce reliable results (Haytowitz *et al*., 2000). Therefore, other targeted surveys of food intake are being combined with preliminary or existing food composition data to identify Key Foods for specific tribes or groups of tribes. Cooperative efforts with the Indian Health Service and NIH nutritionists working with the tribes and tribal leaders will also be used to identify foods consumed by this particular ethnic group.

In 1998, USDA conducted a food consumption survey targeting children, ages 0–9. We have used these food consumption data and existing nutrient data to develop a Key Foods list for this population. These age and ethnic group specific lists will be used to supplement the list for the entire population, described above, to make sure important foods consumed by all Americans are included. The Key Foods analysis is an ongoing project and as new data become available from the combined National Food Surveys over the next few years, new Key Foods lists will be developed to reflect the changing eating habits of Americans. We will use these lists to set priorities for future analyses of foods and to monitor composition data for those foods with high nutrient contributions to the diet. This will allow USDA to more efficiently expand our nationally representative food composition databases, to maintain current and accurate data for significant contributors of dietary components, and to add data for emerging components.

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