

Diet, Ethnicity and Cancer Risk

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Several investigators have pointed to the large variation in cancer incidence and mortality rates that exists between countries¹⁾. For example, stomach cancer in Japan is 25 times greater than in Uganda, Africa, whereas prostate cancer is 40 times greater among U.S. blacks than among Japanese in Japan. Similar differences can be found for other cancer sites in various populations. It is likely that these differences are largely due to environmental factors, such as diet, smoking, alcohol consumption and other lifestyle practices. In several studies²⁾³⁾, dietary intakes have been found to be strongly correlated with geographic differences in the incidence of and mortality from cancer at a number of sites. For instance, Armstrong and Doll²⁾ correlated incidence rates for cancer at various sites in 23 countries with a wide range of dietary intakes. They reported strong positive correlations between diet and cancer, for example, meat intake and colon cancer and fat intake and breast cancer.

These ecologic analyses need careful interpretation. First, the dietary intakes represent available food per capita, not consumed food. There is substantial loss between food availability and consumption due to waste, losses in storage and distribution, use for animals, etc. Second, there is no information on the distribution of the food or nutrient intakes in the population. In other words, there is no adjustment for age, sex or other determinants of food intake. Third, there is no information on the diets of persons who develop cancer, as compared to those who remain healthy.

Epidemiologic studies of cancer in Hawaii

The population of Hawaii is an excellent laboratory for epidemiologic studies of diet, ethnicity and cancer risk. The population includes five major ethnic groups (Japanese, Caucasian, Hawaiian, Filipino, and Chinese), none of whom represents a majority of the population. The Cancer Research Center of Hawaii includes a Cancer Registry, which obtains complete information on all incidence cases in the Islands and classifies the cases according to stage of disease, age, sex and ethnic group. The incidence data reveal wide variations in various cancers among the ethnic groups. For instance, the Japanese and Hawaiians have the highest rates of stomach cancer, whereas colon cancer is highest among the Japanese and Caucasians. On the other hand, the rates of lung cancer are highest among the Hawaiians and Caucasians, although the Japanese smoke more.

Genetic differences do not explain these variations, as seen in studies among migrant groups¹⁾. In Hawaii, stomach cancer which has a high incidence in Japan decreases among the first generation of migrants, with a greater fall in each succeeding generation. The reverse is seen for colon cancer, which has low rates in Japan. There is a rapid rise in the first generation, with no significant change in the second generation. On the other hand, breast cancer increases gradually with each succeeding generation, but never quite reaches the incidence rate of Cauca-

sian women.

Differences are also seen in the dietary intakes of the five ethnic groups. For instance, the cancer Research Center conducted a dietary survey among a random sample of 5,000 presumably healthy adults in the five ethnic groups a few years ago. The diet history focussed on dietary fat and protein, along with selected sources of carbohydrate and vitamin C. One of the major findings was the direct association of dietary fat with breast cancer among the women of the five ethnic groups.

The variations observed in diet and cancer among the ethnic groups led to our conducting several case-control studies. The findings supported current hypotheses, such as the association of saturated fat intake and breast cancer among postmenopausal Japanese and Caucasian women⁴⁾, the relationship of red meat intake and colon cancer (preliminary unpublished data), and the association of saturated fat and prostate cancer⁵⁾. We also reported a positive association of fat and cholesterol⁶⁾ and a negative association of vegetables and carotenoids⁷⁾ with lung cancer.

Development of diet history

For each of our epidemiologic studies, we develop appropriate diet histories (sometimes called quantitative food frequencies), which list those food items that contribute 85 to 90% of the food and nutrient intakes of each ethnic group in the study. Because many people consume typical foods of other ethnic groups, we utilize the same questionnaire for all persons in a particular study. Both the usual frequencies and quantities of intake of each item consumed during a 12-month period are obtained in face-to-face interviews. Quantities are estimated from colored photographs showing three servings (small, medium and large) of most foods. Figure 1 shows a page from a diet history being used in a current study.

Multiethnic cohort in Los Angeles and Hawaii

A few years ago epidemiologists in Los Angeles, California, and Hawaii, with whom I am collaborating, decided to establish a large multiethnic cohort among the populations of Los Angeles and Hawaii. Our rationale was based on the strong benefits of acquiring information of diet and other lifestyle factors in healthy persons rather than persons who have developed cancer. In cohort studies, the healthy participants are followed for 10 to 20 years in order to identify sufficient numbers of incidence cases of cancer. This study design is preferable to case-control studies which begin with sick persons whose reports on their diets could be biased by their illness. Our major aim is to identify the role of diet in the etiology of cancer among several minority populations. The large variations in incidence of various cancers and in dietary intakes of various ethnic groups provide an opportunity to confirm previously reported findings on diet and cancer and to use the results for preventive health programs.

Our initial proposal included a total of eight ethnic groups in the two geographic areas: Japanese, Caucasian, Hawaiian, Filipino, Chinese, Korean, Hispanic and Black. These populations reveal large variations in the incidence rates of most cancers. For example, stomach cancer is more than 4 times greater among Koreans than among Chinese and Filipinos. There is a seven-fold difference in colon cancer among Black and Japanese males compared with Korean

males. The highest rates of breast cancer are found among the Hawaiians and Caucasians, who have five times the rates of the Koreans. Black males have at least 12 times as much prostate cancer as Korean males.

These findings led to our developing an appropriate diet history for use among the eight ethnic groups. The diet history was developed from three-day measured food records from 60 persons of each ethnic group. To determine the feasibility of establishing a cohort of 300,000 persons in the two geographic areas, we conducted a pilot study among a random sample of 12,000 persons from the eight groups.

Analysis of the diet histories revealed some interesting variations among the eight ethnic groups. Tables 1 and 2 show the range of average daily intakes of calories and a few nutrients for males and females, respectively. Of particular interest was the intake of total fat, which ranged from 23 g in Filipino males to 158 g in Black males. For females, fat intake ranged from 19 g in Koreans to 149 g in Blacks. Differences in the intakes of various foods may be equally important for understanding the causation of some cancers. Tables 3 and 4 show the range of intakes of a few food items for males and females, respectively. There were sevenfold differences for the consumption of rice among both sexes. For other food items, differences ranged from two-fold to five-fold. These large variations in nutrient and food intakes are highly desirable for identifying etiologic factors related to the causation and prevention of cancer.

We utilized the results of the pilot study to revise the dietary history in the questionnaire.

Table 1. Range of dietary intakes among eight ethnic groups*(Males)

Component	Minimum	Maximum
Total calories	846(Blk)	3,725(Hwn)
β-Carotene(mcg)	900(Blk)	12,100(Kor)
Total fat(g)	23(Fil)	158(Blk)
% Calories from fat	20(Fil)	43(Blk, Hwn, Cau, Hsp)

*Mid-points of first and last quintiles of intake

Table 2. Range of dietary intakes among eight ethnic groups*(Females)

Component	Minimum	Maximum
Total calories	699(Blk)	3,379(Hwn)
β-Carotene(mcg)	700(Blk)	12,800(Blk)
Total fat(g)	19(Kor)	149(Blk)
% Calories from fat	20(Kor)	46(Blk)

*Mid-points of first and last quintiles of intake

Table 3. Range of daily food intakes(g) among eight ethnic groups*(Males)

Food item	Minimum	Maximum
Rice	51(Blk)	372(Fil)
Processed meats	8(Chn)	22(Hwn)
Dried beans	12(Chn, Jpn)	54(Hsp)
Green vegetables	20(Hsp)	48(Chn)
Citrus fruit	38(Hwn)	63(Chn)
Whole milk	47(Jpn)	199(Hsp)

*Age-adjusted mean intakes

Table 4. Range of daily food intakes(g) among eight ethnic groups*(Females)

Food item	Minimum	Maximum
Rice	37(Blk)	283(Kor)
Processed meats	5(Kor)	17(Hwn)
Dried beans	9(Chn, Jpn)	48(Hsp)
Green vegetables	32(Hsp)	68(Chn)
Citrus fruit	45(Hwn, Blk)	74(Kor)
Whole milk	46(Jpn)	124(Hsp)

*Age-adjusted mean intakes

The study has been funded, and we are currently recruiting the participants in Los Angeles and Hawaii.

Dietary Hypotheses

The following hypotheses are among several that will be addressed in our study :

- 1) Role of calories, fat and alcohol in enhancing breast cancer.
- 2) Role of dietary fiber and micronutrients in reducing breast cancer
- 3) Role of fat, protein and alcohol in increasing colon cancer.
- 4) Role of calcium, dietary fiber, carotenoids and tocopherols in reducing colon cancer.
- 5) Role of fat, vitamin A and carotenoids on prostate cancer.
- 6) Role of vegetables, carotenoids and indoles in reducing lung cancer.
- 7) Role of fruits and vegetables in reducing stomach cancer.

Follow-up of Cohort

Although our intent is to follow the cohort for 10 to 20 years, the reviewers of our grant proposal focussed only on the period of the grant, which is limited to a 5-year period. Because the incidence rates of cancer among Koreans, Chinese and Filipinos are generally far lower than the rates among other ethnic groups and because these three populations are not as large as the others, the reviewers recommended that these three groups be omitted for this cohort study. However, in our judgement, these migrant populations in the United States should be studied further to understand their particular cancer patterns and to identify factors related to their generally lower incidence rates. Consequently, we will be seeking additional funds for establishing Korean, Chinese and filipino cohorts in the two geographic areas. For our ongoing multiethnic cohort, there will be continual surveillance. Questionnaires will be mailed periodically to identify any changes in demographics, health status, diet and other lifestyle factors. In addition, a representative sample from each ethnic-sex group will be randomly selected for validation of the diet histories and for biochemical measurements of blood and urine samples.

In conclusion, the large variation in both dietary intakes and cancer incidence among the diverse ethnic groups in this cohort study will provide an opportunity to address various hypotheses concerning the relationship of dietary risk factors to the etiology of several specific cancers. These findings will have significant public health implications.

PROCESSED MEATS AND MEXICAN DISHES	AVERAGE USE DURING LAST YEAR								YOUR USUAL SERVING SIZE
	Never or hardly ever	Once a month	2 to 3 times a month	Once a week	2 to 3 times a week	4 to 6 times a week	Once a day	2 or more times a day	
Bacon (includes Canadian bacon)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1 slice or strip or piece OR <input type="radio"/> 2 slices OR <input type="radio"/> 3 slices or more
Regular Hot Dogs (beef or pork)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1/2 hot dog OR <input type="radio"/> 1 hot dog OR <input type="radio"/> 2 hot dogs or more
Chicken or Turkey Hot Dogs or Luncheon Meats	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1/2 hot dog or 1 slice OR <input type="radio"/> 1 hot dog or 2 slices OR <input type="radio"/> 2 hot dogs or 3 slices or more
Spam, Bologna, Salami, Pastrami or Other Luncheon Meats	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1 slice (1 ounce or less) OR <input type="radio"/> 2 slices OR <input type="radio"/> 3 slices or more
Sausage (such as pork, beef, chorizo, Polish, Vienna, Portuguese, hot links)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1 piece or link OR <input type="radio"/> 2-3 pieces or links or 1 patty OR <input type="radio"/> 4 pieces or links or more
Tacos, Tostadas, Sopas, or Taco Salad (with beef or pork)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1 item or less OR <input type="radio"/> 2 items OR <input type="radio"/> 3 items or more
Tacos, Tostadas, Sopas, or Taco Salad (with chicken)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1 item or less OR <input type="radio"/> 2 items OR <input type="radio"/> 3 items or more
Meat Burritos (includes beef and bean and other combinations)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1 fast-food burrito OR <input type="radio"/> 1 medium burrito OR <input type="radio"/> 1 large or 2 fast-food burritos
Vegetable or Bean Burritos, Tacos, or Tostadas (no meat)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1 item or less OR <input type="radio"/> 2 items OR <input type="radio"/> 3 items or more
Enchiladas with Chicken	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1 enchilada or less OR <input type="radio"/> 2 enchiladas OR <input type="radio"/> 3 enchiladas or more
Enchiladas with Beef	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1 enchilada or less OR <input type="radio"/> 2 enchiladas OR <input type="radio"/> 3 enchiladas or more
Enchiladas with Cheese, Quesadillas, or Nachos with Cheese	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1 enchilada or small quesadilla OR <input type="radio"/> 2 enchiladas or 1 serving nachos OR <input type="radio"/> 3 enchiladas
Tamales	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1/2 tamale or less OR <input type="radio"/> 1 tamale OR <input type="radio"/> 2 tamales or more
Chili Relienos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1/2 chili relleno or less OR <input type="radio"/> 1 chili relleno OR <input type="radio"/> 2 chili rellenos or more

FIGURE 1

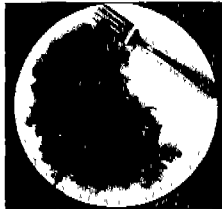
For EACH FOOD GROUP, fill in the circle that best describes HOW OFTEN you ate those items during the last year. Then fill in the circle that best describes your USUAL SERVING SIZE.

RICE, POTATOES, TARO, AND POI	AVERAGE USE DURING LAST YEAR								YOUR USUAL SERVING SIZE
	Never or hardly ever	Once a month	2 to 3 times a month	Once a week	2 to 3 times a week	4 to 6 times a week	Once a day	2 or more times a day	
White Rice (includes musubi)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1/2 cup or 1 scoop or less OR <input type="radio"/> 1 rice bowl (1 cup) or 1 musubi OR <input type="radio"/> 2 rice bowls or 2 musubi or more
Sushi or Barazushi	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1-2 pieces or small cone OR <input type="radio"/> 3-4 pieces or 1 large cone or 1/2 cup OR <input type="radio"/> 5 pieces or 1 cup or more
Brown or Wild Rice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1/2 cup or 1 scoop or less OR <input type="radio"/> 1 cup or 2 scoops OR <input type="radio"/> 2 cups or more
Mexican or Spanish Rice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1/2 cup or less OR <input type="radio"/> 1 cup OR <input type="radio"/> 2 cups or more
Fried Rice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1/2 cup or less OR <input type="radio"/> 1 cup OR <input type="radio"/> 2 cups or more
French-Fried, Hash-Browned or other Fried Potatoes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> fast-food small order or 1 cup OR <input type="radio"/> fast-food medium order OR <input type="radio"/> fast-food large order or more
Mashed, Scalloped or Au Gratin Potatoes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1/2 cup or 1 scoop or less OR <input type="radio"/> 1 cup or 2 scoops OR <input type="radio"/> 2 cups or more
Baked or Boiled White Potatoes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1 small or 1/2 medium or less OR <input type="radio"/> 1 medium (about 5 inches) OR <input type="radio"/> 1 large potato or more
Yellow-Orange Sweet Potatoes or Yams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1 small or 1/2 medium or less OR <input type="radio"/> 1 medium (about 5 inches) OR <input type="radio"/> 1 large potato or more
White or Purple Sweet Potatoes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1 small or 1/2 medium or less OR <input type="radio"/> 1 medium (about 5 inches) OR <input type="radio"/> 1 large potato or more
Taro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1/4 taro or less OR <input type="radio"/> 1/2 taro OR <input type="radio"/> 1 whole taro or more
Poi	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1/4 cup or less OR <input type="radio"/> 1/2 cup OR <input type="radio"/> 1 cup or more

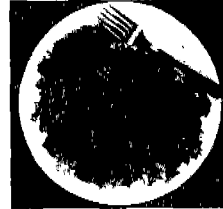
For EACH FOOD GROUP, fill in the circle that best describes HOW OFTEN you ate those items during the last year. Then fill in the circle that best describes your USUAL SERVING SIZE.



A



B



C

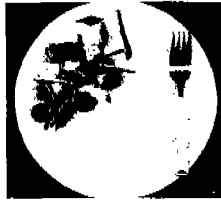
SALAD ITEMS, EGGS, AND OTHER NON-MEAT ITEMS	AVERAGE USE DURING LAST YEAR								YOUR USUAL SERVING SIZE
	Never or hardly ever	Once a month	2 to 3 times a month	Once a week	2 to 3 times a week	4 to 6 times a week	Once a day	2 or more times a day	
Light Green Lettuce or Tossed Salad (such as iceberg or head lettuce)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> Photo A (1/2 cup or less) OR <input type="radio"/> Photo B (about 1 cup) OR <input type="radio"/> Photo C (1-1/2 cups or more)
Dark Green Lettuce (such as romaine, red, butter, manoa, endive)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> Photo A (1/2 cup or less) OR <input type="radio"/> Photo B (about 1 cup) OR <input type="radio"/> Photo C (1-1/2 cups or more)
Tomatoes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 2 slices or wedges or 2 cherry tomatoes or less OR <input type="radio"/> 4 slices or 1/2 medium tomato OR <input type="radio"/> 1 medium tomato or more
Coleslaw	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1/4 cup or less OR <input type="radio"/> 1/2 cup OR <input type="radio"/> 1 cup or more
Regular Salad Dressings or Mayonnaise Added to Salads	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 2 teaspoons or less OR <input type="radio"/> 1 Tablespoon OR <input type="radio"/> 2 Tablespoons or more
Low-Calorie or Diet Dressings Added to Salads	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 2 teaspoons or less OR <input type="radio"/> 1 Tablespoon OR <input type="radio"/> 2 Tablespoons or more
Eggs, Cooked or Raw (includes egg salad)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1/2 egg OR <input type="radio"/> 1 egg or 1 sandwich OR <input type="radio"/> 2 eggs or more
Egg Substitute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 2 Tablespoons OR <input type="radio"/> 1/4 cup (= 1 egg) OR <input type="radio"/> 1/2 cup (= 2 eggs) or more
Tofu (soybean curd)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 2 cubes or 1/4 cup OR <input type="radio"/> 1/4 block or 1/2 cup OR <input type="radio"/> 1/2 block or more
Vegetarian Meat Loaf, Meatballs or Patties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> 1 to 2 meatballs OR <input type="radio"/> 1 patty or slice or 3 meatballs OR <input type="radio"/> 1 large patty, 5 meatballs or more

FIGURE 1

For EACH FOOD GROUP, fill in the circle that best describes HOW OFTEN you ate those items during the last year. Then fill in the circle that best describes your USUAL SERVING SIZE.



A



B



C

RAW OR COOKED VEGETABLES (NOT IN SOUPS OR MIXED DISHES)	AVERAGE USE DURING LAST YEAR								YOUR USUAL SERVING SIZE
	Never or hardly ever	Once a month	2 to 3 times a month	Once a week	2 to 3 times a week	4 to 6 times a week	Once a day	2 or more times a day	
Broccoli (raw or cooked)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> Photo A (1/4 cup or less) OR <input type="radio"/> Photo B (about 1/2 cup) OR <input type="radio"/> Photo C (1 cup or more)
Cabbage (such as head, Chinese or Napa cabbage, Brussels sprouts)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> Photo A (1/4 cup or less) OR <input type="radio"/> Photo B (about 1/2 cup) OR <input type="radio"/> Photo C (1 cup or more)
Dark Leafy Greens (such as spinach, collard, mustard or turnip greens, bok choy, watercress, chard)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> Photo A (1/4 cup or less) OR <input type="radio"/> Photo B (about 1/2 cup) OR <input type="radio"/> Photo C (1 cup or more)
Green Beans or Peas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> Photo A (1/4 cup or less) OR <input type="radio"/> Photo B (about 1/2 cup) OR <input type="radio"/> Photo C (1 cup or more)
Other Green Vegetables (such as zucchini, celery, asparagus, green pepper, okra)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> Photo A (1/4 cup or less) OR <input type="radio"/> Photo B (about 1/2 cup) OR <input type="radio"/> Photo C (1 cup or more)
Cauliflower	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> Photo A (1/4 cup or less) OR <input type="radio"/> Photo B (about 1/2 cup) OR <input type="radio"/> Photo C (1 cup or more)
Carrots (raw or cooked)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> Photo A (or 4-5 sticks or less) OR <input type="radio"/> Photo B (1/2 cup or 1 med.) OR <input type="radio"/> Photo C (1 cup or more)
Corn (fresh, frozen, or canned)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> Photo A (1/4 cup or less) OR <input type="radio"/> Photo B (1/2 cup or 1 cob) OR <input type="radio"/> Photo C (1 cup or more)
Pumpkin or Yellow-Orange Winter Squash	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> Photo A (1/4 cup or less) OR <input type="radio"/> Photo B (about 1/2 cup) OR <input type="radio"/> Photo C (1 cup or more)
Other Vegetables (such as white or summer squash, beets, eggplant)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	CHOOSE ONE <input type="radio"/> Photo A (1/4 cup or less) OR <input type="radio"/> Photo B (about 1/2 cup) OR <input type="radio"/> Photo C (1 cup or more)

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