



A New Standardized Food Grouping System Facilitates Studies of Diet and Chronic Diseases

Sangita Sharma PhD

Cancer incidence varies among ethnic groups¹ and it has been hypothesized that this may in part be explained by differing dietary patterns. There have been many studies examining associations between nutrients and cancer. While these studies are important in understanding the underlying mechanism and etiology of cancer, they are of limited use in the development of dietary recommendations to reduce risk factors because people choose foods not individual nutrients. The goal of most nutritional epidemiology studies is to make recommendations for improvements in health. Therefore studies focusing on usual eating patterns, food groups and overall diets, allow the results to be translated into meaningful public health messages.^{2,3}

One difficulty in studying food group intakes has been the inconsistency in the grouping scheme. For example, one research group may allocate potatoes to the vegetable group while another may include them in the starchy staples group. This may result in one study showing an association between vegetables and cancer, while another may not. A further difficulty is allocating foods that are part of mixed dishes. For example, does a cheese and tomato pizza go into the bread group, or is it divided up into the ingredients and each component allocated to its respective group? Another challenge when grouping food intakes is combining different forms of a food. For example, the water content of 100 grams of fresh apricot is very different from that for dried apricots, and some adjustment should be made before putting these foods into the same food group.

To help overcome these and many other issues that arise when using dietary data, the United States Department of Agriculture (USDA) has developed a Pyramid Servings Database (PSD). This is a database that lists the number of standardized food group servings for all foods that have been reported in the national surveys (approximately 7,000). There are 26 food groups on the PSD corresponding to those used in the Food Guide Pyramid (FGP). Using the PSD serving sizes one can compare food group intakes with the FGP dietary recommendations.

The FGP recommendations are designed to help Americans make healthful food choices and reduce the risk of chronic diseases including cancer.^{4,7} The FGP recommends a range of daily servings based on age and caloric intake from five major groups: grains, vegetables, fruits, dairy and meat.⁸ The FGP also provides guidance on limiting intakes of discretionary fat, added sugar and alcohol. One limitation of the PSD was that it did not include all foods consumed in Hawaii because most of the national nutrition surveys do not include our state. However, we have recently extended the database to include many local foods and are now able to compare the diets of our study populations with the dietary recommendations.⁹ Table 1 shows data from participants in the Multiethnic

Cohort study (MEC) and the proportion that are not meeting the dietary recommendations. The MEC is a prospective cohort study in Hawaii and Los Angeles (LA) of 215,000 men and women, aged 45-75 years at baseline in 1993-96. Data from the MEC are being used to determine associations between diet and cancer as well as other chronic diseases. Subjects are included from five ethnic groups African-American, Japanese American, Native Hawaiian, Hispanic, and Caucasian. Table 1 includes data only from the three ethnic groups in Hawaii: Japanese Americans (n=25,893 men; n=28,355 women), Native Hawaiians (n=5,979 men; n=7,650 women) and Caucasians (n=21,933 men; n=25,303 women).

Table 1.—The percentage of each ethnic group not consuming the recommended number of Pyramid Servings by gender*

Food Group	Hawaiian %	Japanese American %	Caucasian %
Grain			
Men	35	27	57
Women	46	41	63
Vegetables			
Men	39	42	39
Women	31	34	35
Fruits			
Men	64	63	59
Women	52	46	48
Dairy			
Men	84	97	81
Women	88	95	76
Meat & Meat Alternates			
Men	45	56	75
Women	58	74	96

*Adapted from Sharma et al, 2003b¹⁰

Adherence to the dairy recommendations was poor for all three ethnic groups. Approximately half of all participants did not adhere to the recommendations for fruit and over half did not meet the recommendations for meat and meat alternatives. It is important to examine degree of adherence to the dietary recommendations by ethnic group so specific interventions to improve dietary intake can be developed. For example, dairy product intake is low in Native Hawaiians and Japanese Americans, so calcium intake might be increased from non-dairy sources such as small fish in which the bones are eaten.

We are also using the MEC to determine if degree of adherence to the dietary recommendations is a predictor of cancer and other chronic diseases. Our preliminary analyses show that fruit and vegetable consumption is not related to prostate cancer, but is protective for colorectal cancer. We are currently extending these analyses to other food groups and cancer sites (breast, lung). Examining differences in dietary patterns between ethnic groups is of importance because it may provide insight into causes of differing rates of cancer and other chronic diseases.

For more information on the Cancer Research Center of Hawaii, please visit our website at www.crch.org.

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"Na Kauka O Hawaii," continued on p. 269

In his almost 20 years of residence in the Islands, Dr. Hillebrand visited all the larger islands, botanizing whenever possible. He carefully preserved and studied these plants as well as those which correspondents sent to him. Many rare trees, planted by the doctor himself, are still to be seen on the grounds of the Queen's Hospital. Foster Gardens on Nuuanu Avenue, which was Dr. Hillebrand's former home, has another collection of exotic trees and flowers planted by the doctor. A lovely native begonia is named Hillebrandia in his honor.

Dr. Hillebrand and his family left Hawaii for the last time on June 27, 1871. The winter of 1871-1872 was spent in Cambridge, Massachusetts, where he began with Professor Asa Gray's¹ assistance the manuscript of his monumental "Flora of the Hawaiian Islands". In this work some 250 species of rare plants, then unknown to the botanical world, are described.

Following his stay in Cambridge he traveled extensively in Germany, Switzerland, Madeira, and Tenerife. Finally he returned to Heidelberg where he had spent such happy student years to end his days.

Though painfully ill for his last two years, Dr. Hillebrand managed to complete writing much of the manuscript of "Flora of the Hawaiian Islands" and submitted part of it to "Carl Winer, University-Bookseller". He had the satisfaction of correcting the first few pages of the proofs of his book before he died.

His son, Dr. William F. Hillebrand, a chemist, with the help of Professor E. Askernasy of Heidelberg, carefully and expertly edited the work, publishing it posthumously in 1888.

Willis T. Pope in his article about Dr. Hillebrand in the "Hawaiian Annual" for 1919 describes the doctor in middle age as "a quiet, sober, practical man of medium height and weight, complexion fair, eyes gray and possessing an abundance of rather dark hair". He was a linguist, being fluent in German, French, English, Latin, and Hawaiian. Not surprisingly, his favorite recreation was working among his horticultural specimens in the garden of his home. He was also described as a "capable" pianist who enjoyed playing at social gatherings.

1. Asa Gray, a professional botanist at Harvard, had described some new plants collected in the Hawaiian Islands, chiefly by the U.S. Exploring Expedition under Commander Wilkes. He died on July 13, 1886, in Heidelberg at the age of 64.

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