

# Dietary Fat Intake and Cancer Incidence among Five Ethnic Groups in Hawaii<sup>1</sup>

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## Abstract

Average daily intakes of several components of fat in the diets of the five main ethnic groups in Hawaii were determined from personal interviews of 4137 subjects regarding their food consumption in a usual week. In general, fat intake was highest among Caucasians and lowest among Filipinos. Cholesterol intake did not follow the same pattern as that of the other fat components. The intake of total fat showed good correlation with the ethnic-specific incidence rates of breast cancer in Hawaii but not with colon or prostate cancer rates. There was no correlation of cholesterol intake with colon cancer incidence.

## Introduction

The incidence of cancers with possible dietary etiologies (e.g., colon, rectum, stomach, and breast) varies considerably among the 5 main ethnic groups in Hawaii. It is not known, however, whether there are detectable differences in the intake of foods and nutrients among these same groups. A finding of significant correspondence between selected dietary intakes and cancer incidence patterns in a small geographic area like Hawaii would give added support to certain dietary hypotheses and provide the basis for further diet-related epidemiological research in this multiethnic population. This report presents ethnic-specific data on the fat intake of a representative sample of the population of Hawaii and shows the relationship of dietary fat to colon, breast, and prostate cancer incidence.

## Materials and Methods

Ethnic- and sex-specific cancer incidence rates for the period 1972 to 1976 were computed from data in the Hawaii Tumor Registry, using population estimates for 1974 provided by the Hawaii Department of Health. These population estimates were based on data obtained in a continuing survey conducted annually by the Department of Health on approximately 2% of the households in Hawaii. Dietary data were obtained from the same survey population but were limited to persons who were 45 years of age or older, lived on the Island of Oahu, and were either Caucasian, Japanese, Chinese, Hawaiian, or Filipino. Each individual sampled by the Department of Health who met the eligibility requirements for this study was contacted by a member of our staff to arrange for a home interview. The response rate was 88%. The dietary method, tested previously for validity and reliability, was a recall of

specific food items or groups eaten in a usual week. These foods were selected from a review of food records specifically collected at the start of the study and were chosen to provide relatively comprehensive coverage of the dietary sources of fat, protein, vitamin C, and other nutrients in these ethnic groups. Both frequencies and amounts were determined for each item consumed. Amounts were estimated by having the subject select small, medium, or large portions from 5- x 7-inch colored photographs. Plates and bowls used in the pictures were provided in order to give a sense of scale. The interview lasted 30 to 40 min. The information was recorded on precoded forms for computer analysis using food composition data in United States Department of Agriculture Handbook No. 8, supplemented with data from Japan and Hawaii and with home recipes.

Both the cancer incidence rates and the mean daily fat intake values were adjusted for age by the direct method, using the world population standard for age 45 and older (10).

## Results

Table 1 shows the mean daily intakes of several components of fat in the diets of the 5 main ethnic groups, based on 4137 interviews. Linoleic acid, an essential polyunsaturated fatty acid, is also included in the unsaturated fat category. The first 4 components (total, animal, saturated fat, and unsaturated fat) show similar relationships among the groups. The pattern is one of highest intakes in Caucasians and lowest intakes in Filipinos. This is seen for both men and women. The pattern for cholesterol differs from that of the other fat components. Cholesterol intake is highest among Hawaiians (both men and women), and the Filipino intake ranks second among women and third among men. The Japanese consume the least cholesterol in their diet.

Total fat intake is shown in relation to cancer incidence for 3 sites in Chart 1. The data for colon and prostate cancers do not suggest any association of this nutrient with cancer incidence. On the other hand, there is a clear correspondence between total dietary fat and the ethnic-specific incidence rates for female breast cancer. From the data in Table 1, it can be seen that similar relationships would be seen for breast cancer and either saturated or unsaturated fatty acids.

## Discussion

Associations of breast, prostate, and colon cancers with per capita consumption of dietary fat have been reported in several geographic correlation studies (1, 2, 4). The problems with such ecological analyses are well known. Although our dietary data are based on actual intake rather than food availability estimates, the lack of control for possible confounding factors does remain.

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Table 1

Average daily dietary fat intake among 5 ethnic groups in Hawaii (age-adjusted, 45 years and older)

	Total fat (g)	Animal fat (g)	Saturated fat (g)	Unsaturated fat (g)	Linoleic acid (g)	Cholesterol (mg)
<b>Men</b>						
Caucasian (539) <sup>a</sup>	82.7	50.0	29.8	44.8	11.9	367.8
Japanese (823)	68.2	39.9	23.5	38.1	10.6	328.9
Chinese (175)	71.3	43.6	25.4	39.8	10.5	323.7
Filipino (319)	58.7	38.5	21.4	31.6	7.3	338.0
Hawaiian (193)	75.1	48.0	26.6	40.6	10.4	392.9
<b>Women</b>						
Caucasian (477)	62.9	36.7	22.1	34.4	9.5	275.7
Japanese (978)	53.5	30.1	18.4	30.2	8.6	252.6
Chinese (159)	55.2	34.4	19.6	30.6	8.0	267.4
Filipino (221)	48.1	30.2	17.4	26.0	6.2	284.5
Hawaiian (253)	58.5	36.5	20.8	31.9	8.1	289.3

<sup>a</sup> Numbers in parentheses, number of persons interviewed.

The data in Table 1 show notable variation in fat intake among these ethnic groups. This heterogeneity indicates that Hawaii is one region of the United States where case-control studies of diet and cancer may be productive. The low fat intake in Filipinos is of interest, since this group has the lowest risks for cancer in general in Hawaii. On the other hand, Hawaiians, who have high fat intake values, are a very-high-risk group for cancer in general; however, they have a low incidence for 2 major sites, colon and rectum.

The association of breast cancer with dietary fat that was seen here has been reported both in geographic correlation studies and in a case-control study where, however, the relationship was weak (1, 2, 4, 7). A mechanism by which dietary fat intake could lead to increased risk for breast cancer has been suggested (9).

Although both prostate and colon cancers have been associated with dietary fat in geographic correlation studies (1, 2, 4), the findings were not reproduced here. Case-control studies of colon cancer and dietary fat or meat consumption have usually reported negative results (5, 8). A recent report indicated that the positive correlation of colon cancer with fat intake was confounded by dietary cholesterol (6). A hypothesis regarding cholesterol as a cocarcinogen in the etiology of colon cancer has been proposed (3). However, the data in Table 1 do not show a positive correlation of ethnic-specific cholesterol intakes with colon cancer in either men or women.

At the present time, we are refining our analysis of these data to adjust for possible ethnic variation in the completeness of nutrient estimates based on dietary recall. We have collected food records on a subsample of our interviewed subjects and are comparing nutrient estimates in records and recalls by ethnicity and sex. Certain of the relationships reported here could change if we find that our recall questionnaire does not provide the same proportion of the total intake for each ethnic group.

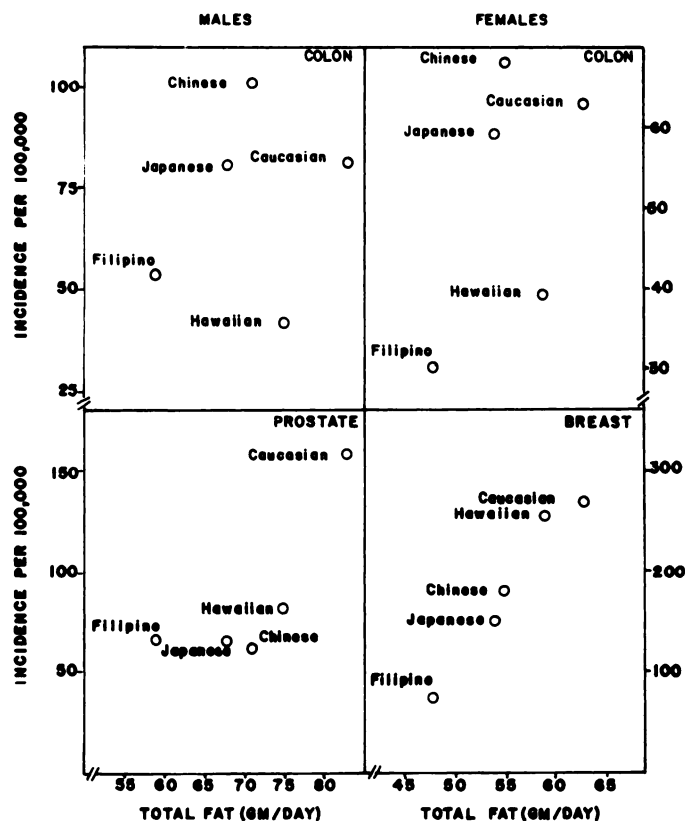


Chart 1. Dietary fat intake of 5 ethnic groups in Hawaii in relation to cancer incidence (age adjusted, 45 years and older).

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