

HAWAII HEALTH SURVEY: FISH CONSUMPTION FOR ADULTS IN HAWAII

HHS, 2007 AND 2008

Kathleen Kromer Baker, PhD¹, Corilee Watters, PhD, RD², Alvin T. Onaka, PhD¹, Brian Horiuchi MS¹, Jim Dannemiller, President³, and Barbara Brooks, PhD⁴.

¹Office of Health Status Monitoring, Hawaii Department of Health, ²University of Hawaii, ³SMS Research, ⁴Hazard Evaluation and Emergency Response, Hawaii Department of Health

Hawaii Department of Health

Highlights

- From 2007 to 2008, 90% of the adults of Hawaii consumed fish at least once a month with 41.6% of adults eating fish at least 2 or more times per week.
- A majority, 87.6%, of adults that consumed fish ate large ocean fish and 65.2% ate canned tuna.
- Fish consumption rates are highly skewed to the right, a minority of (3.2%) of adults were consuming fish once a day or more, with a serving size of 5.0 or more ounces.
- The average weekly (mean) per capita consumption was 9.1 ounces which more than meets the USDA's 2010 Dietary Guidelines (USDA and HHS, 2010)¹ for adult Americans.
- However, for skewed data the median is useful (that value where approximately 50% of values are above or below). The median weekly per capita consumption was 5.3 ounces which does not meet the USDA Guideline.
- Highest fish consumption was for Filipino and Native Hawaiian adult males (median 9.0 and 8.9 ounces per week),
- Of the 25% of adults that said they had concerns about eating fish, mercury and ciguatera were listed most frequently.

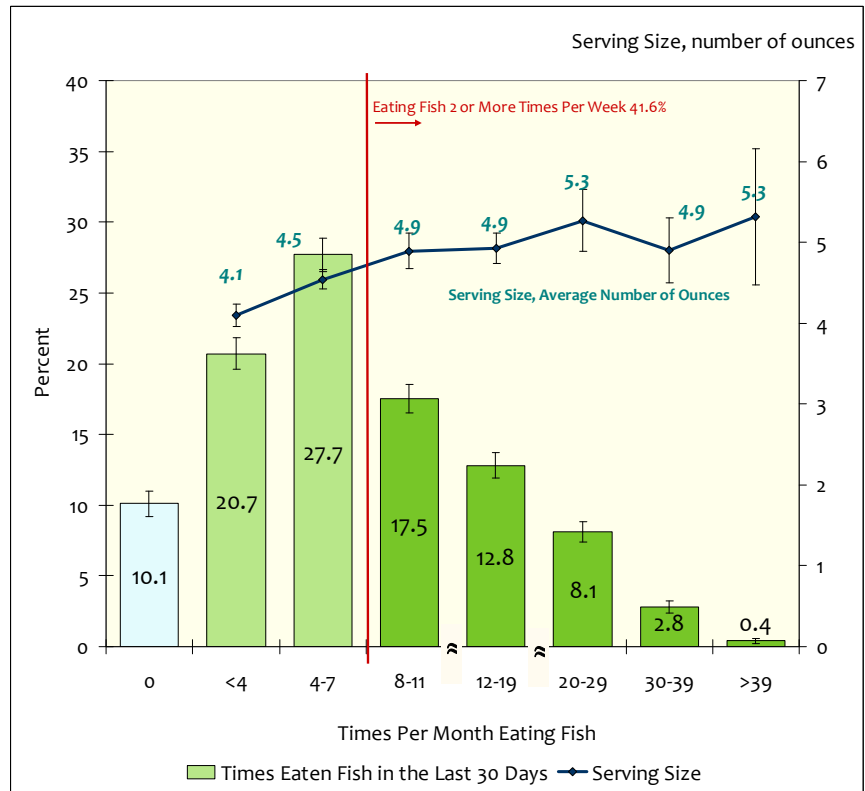


FIGURE 1. Adults of Hawaii. Whether it is breakfast, lunch, or dinner - canned, frozen, or fresh. How many times did you eat fish in the last 30 days? Percent and Mean Ounces Per Day with 95 % confidence limits. Data Source: Hawaii Health Survey (HHS), 2007 and 2008 Average

Introduction

The Office of Health Status Monitoring of the Hawaii Department of Health is responsible for the Hawaii Health Survey, an annual household survey of Hawaii's households and population. The survey was initiated in 1968 and became a telephone survey in 1996.²

In 2007 and 2008 adults in Hawaii were questioned on their total fish consumption per month: "Whether it is breakfast, lunch, or dinner - canned, frozen, or fresh. How many times did you eat fish in the last 30 days?" In addition they were asked about their fresh ocean fish, freshwater lake and stream fish, and canned tuna consumption in the last 30 days.

They were asked “When you eat fish how large a serving, in ounces do you eat? 3 ounces is about the size and thickness of a deck of playing cards or a computer mouse.”

Results

Ninety percent of adults in Hawaii consumed fish in the last 30 days. More than one tenth of adults (11.3%) consumed fish twenty times or more per month. As many as 3.2% had fish at least once a day. The serving size increased with the frequency of eating fish. Adults in Hawaii that consumed fish at least twice in one week totaled over 41.6%.

The USDA’s 2010 Dietary Guidelines (USDA and HHS, 2010)¹ for Americans recommends that adults eat 8 or more ounces (two servings) per week. For Hawaii the average weekly fish consumption per capita (all adults) was 9.1 ounces, which more than meets the USDA’s 2010 Dietary Guideline recommendation.

The average Hawaii weekly fish consumption rate of 9.1 ounces is more than twice the mean weekly intake of seafood in the United States of approximately 3.5 ounces (USDA and HHS, 2010). This is consistent with an earlier study (Hudgins, 1980)³ that found that per capita fish consumption in the State of Hawaii was higher than the U.S. average during the years of 1970-1977. Hudgins estimated that the annual per capita consumption of commercial fish and shellfish in the Hawaiian civilian population in 1977 was 22.7 pounds (7.0 ounces per week), while the annual U.S. per capita consumption was 12.8 pounds (4.0 ounces per week).

Because the data are skewed to the right the median (approximately 50%

of values are above or below the median value) consumption may be a better representation of average consumption than the mean.

Median per capita consumption was 5.3 ounces, far below the USDA 2010 Dietary Guideline.

Results Consumers Only

Restricting analysis to only adults that report consuming fish yields a mean of 10.1 ounces of fish per week with a median value of 6.5 ounces. There are 41.0% of adult consumers that are eating 8 ounces or more per week (36.7% of all adults).

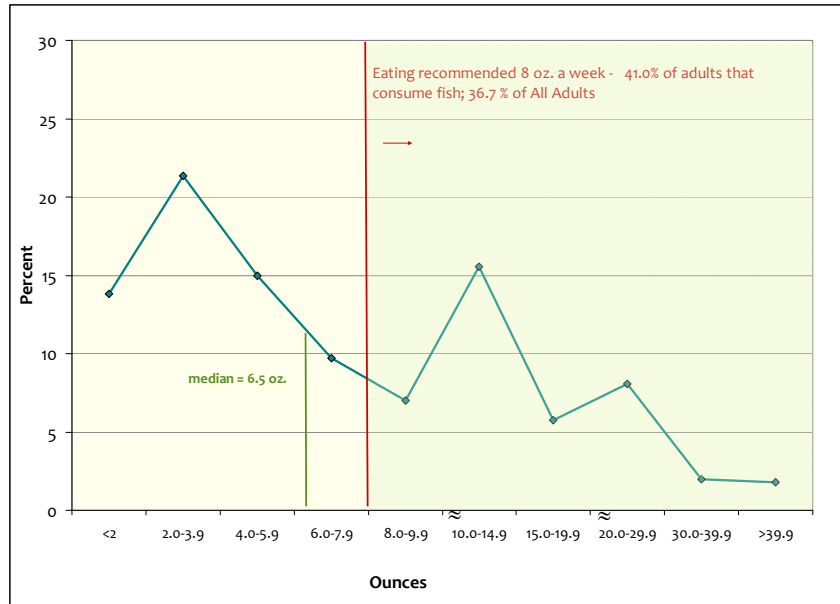


FIGURE 2. Adults of Hawaii. Fish consumption per week in ounces for Consumers Only. Data Source: Hawaii Health Survey (HHS), 2007 and 2008 Average

Per Capita Fish Consumption Per Week in Ounces (Includes Adults with No Fish Consumption)						
n	Adults Weighted	Mean	95% CL	Median	95% CL	95th Percentile
10,669	919,783	9.1	8.8-9.4	5.3	5.3-5.6	27.9
Fish Consumption Among Consumers Only Per Week in Ounces						
n	Adults Weighted	Mean	95% CL	Median	95% CL	95th Percentile
9,706	823,556	10.1	9.8-10.5	6.5	5.9-7.0	33.4

TABLE 1. Adults of Hawaii. Fish consumption per week in ounces. Data Source: Hawaii Health Survey (HHS), 2007 and 2008 Average

To analyze patterns of fish consumption by type of fish the questions asked were:

1. How many times in the last 30 days did you eat large, fresh fish from the ocean? Fish like Ahi, Mahimahi, Aku, or swordfish?
2. How many times in the last 30 days did you eat small fish from Hawai'i freshwater lakes and streams like Tilapia, Barracuda, Papio?
3. How many times in the last 30 days did you eat canned tuna?

Of adults that consume fish, 87.6% report consuming ocean fish. Only 17.0% of adult consumers report eating fish from freshwater lakes and streams. A high percentage of adults that eat fish ate canned tuna at 65.2%.

- The majority of fish consumers report eating fish from more than one category of type of fish. (60%).
- Ocean fish only (28%) account for about 1/4 of adults that consume fish.

Results Consumers Only Demographic

Total fish consumption varies significantly by gender and age (Figure 4.). Compared to the recommended 8 ounces per week:

- Median and 95% confidence intervals consumption by age for females are all below the 8.0 ounce cutoff.
- For males only adults above 74 years have a median with a confidence interval that does not include 8 ounces (significantly less than the recommended amount).
- Younger and older ages have decreased fish consumption for both males and females.

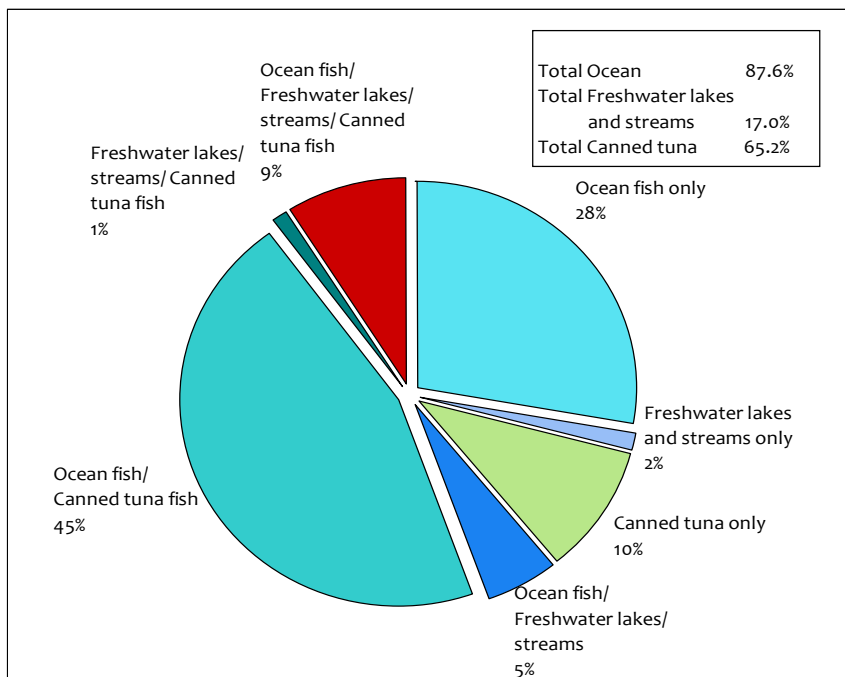


FIGURE 3. Adults of Hawai'i that report consuming fish by type of fish. Data Source: Hawai'i Health Survey (HHS), 2007 and 2008 Average

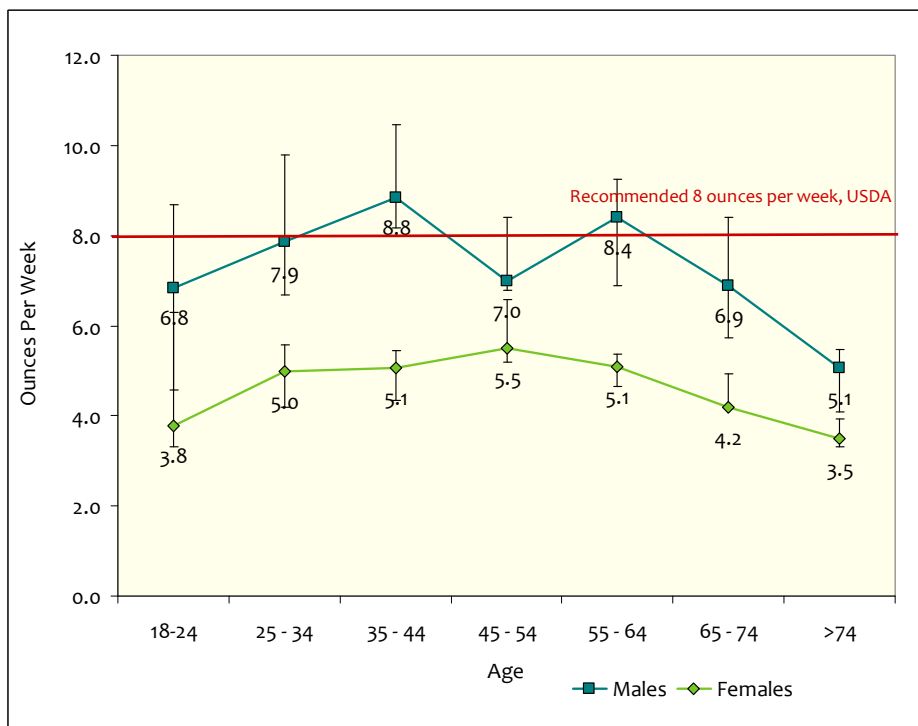


Figure 4. Adults of Hawai'i. Fish consumption per week in ounces for Consumers Only by gender and age. Data Source: Hawai'i Health Survey (HHS), 2007 and 2008 Average

Median fish consumption varies by ethnicity.

- Highest fish consumption occurs among male Native Hawaiians and Filipinos.
- Female fish consumption is lower than males and there is less of a difference among groups than among males.
- White or Filipino adult females have the highest total fish consumption for females.
- For females aged 18-49, the reproductive years, median fish intake for all groups is less than the recommended 8 ounces. Highest consumption is among Filipino females at 6.6 ounces.

Median (95% confidence interval) total fish consumption values vary by geographic area and social economic variables. However, most differences are not statistically significant.

- Kaua'i and then Maui have the highest total median fish consumption (7.0 and 6.9 ounces).
- The pattern by ethnicity indicates that Filipino, Native Hawaiians' Whites, and Others have the highest overall median consumption.
- The pattern by social and economic indicators is complicated with married (and never married), adults with 4+ years of college, and higher income having higher median consumption of fish. No significant difference existed by insurance status.
- None of the median values (or their confidence limits) of total fish consumption per week reached the recommended 8 ounces except for Kaua'i.

Ethnicity	Male				Female			
	18 - 49	50 - 64	>64	TOTAL	18 - 49	50 - 64	>64	TOTAL
Native Hawaiian/Part	9.9	8.3	7.1	8.9	5.0	4.7	5.0	5.0
Filipino	9.2	9.6	5.5	9.0	5.1	6.9	5.2	5.3
White	7.0	8.4	5.5	7.0	5.6	5.6	4.2	5.4
Chinese	8.4	6.8	5.5	7.0	4.1	4.2	3.5	3.9
Japanese	6.7	6.5	4.0	6.6	6.6	3.4	4.0	4.8
Other	6.6	6.7	6.9	6.8	5.1	5.4	3.2	5.1
TOTAL	8.4	7.6	5.6	7.2	5.3	5.2	4.2	5.2

Legend	<4.5	4.5-5.9	6.0-6.9	7.0-7.9	8.0-8.9	>=9.0
--------	------	---------	---------	---------	---------	-------

Figure 5. Median total fish consumption (95% confidence interval) by ethnicity, gender and age for adults consumers of fish of Hawai'i Data Source: Hawai'i Health Survey (HHS), 2007 and 2008 Average

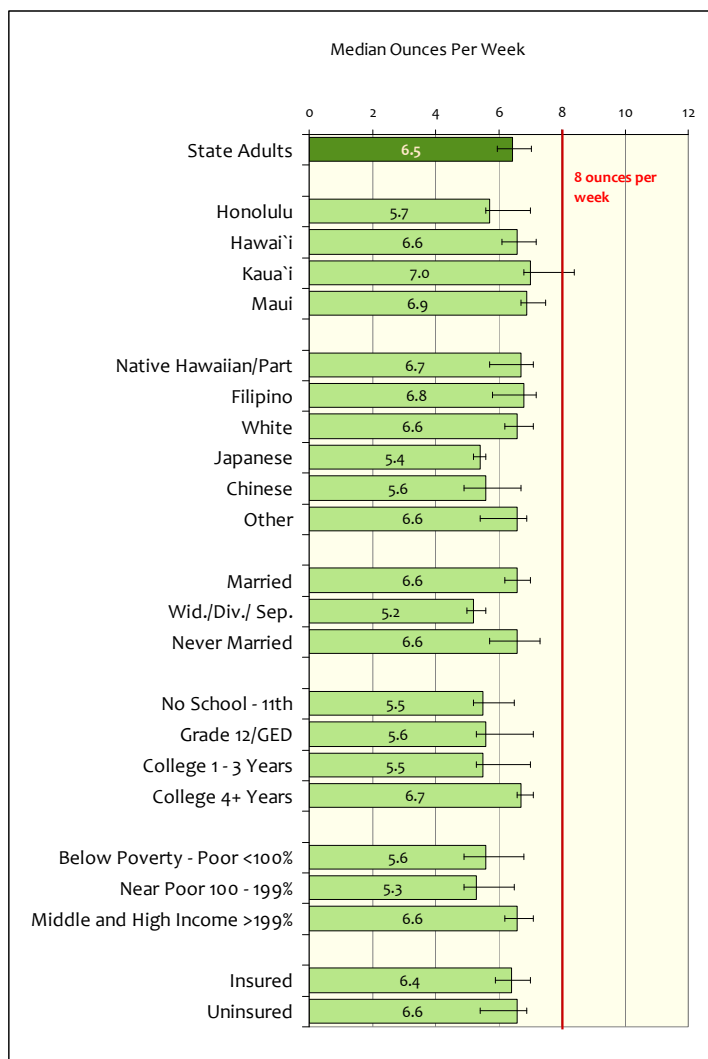


Figure 6. Median fish consumption (95% confidence interval) by geographic area and social economic variables for adults consumers of fish of Hawai'i Data Source: Hawai'i Health Survey (HHS), 2007 and 2008 Average

Results Fish Concerns

All adult respondents were asked “Have you ever been concerned about eating fish in Hawai‘i?” If they were concerned they were then asked “What are your concerns? (they could list up to 6 responses). The responses were not read to the respondent.

- 25% of the adult population of Hawai‘i have concerns about eating fish in Hawai‘i. Adults that consumed fish had a higher percentage of concerns.
- Mercury and ciguatera concerns were listed most frequently, followed by pollution and chemical contamination.

Conclusion

Overall, given the strong health benefits of consuming fish⁴ further work needs to be done on promoting the importance of “Healthy Seafood” consumption in Hawai‘i and monitoring intakes across the population.

References

- U.S. Department of Agriculture and U.S. Department of Health and Human Services. Dietary Guidelines for Americans, 2010. 7th Edition, Washington, DC: U.S. Government Printing Office, December 2010.
- Hawai‘i Health Survey, Hawai‘i Department of Health, Office of Health Status Monitoring, Web <http://hawaii.gov/health/statistics/hhs/index.html>
- Hudgins, L.L. 1980. Per Capita Annual Utilization and Consumption of Fish and Shellfish in Hawai‘i, 1970-77.

Concerns About Eating Fish By fish Consumption			
Fish Consumption	Have you ever been concerned about eating fish in Hawaii?		
	Yes	No	% Yes
No Fish Consumption	17,547	96,226	18.2
Fish Consumption <8 oz.	120,439	485,996	24.8
Fish Consumption >=8 oz.	93,625	337,561	27.7
Refused	11,510	53,173	21.6
Total Adult Population	243,120	972,956	25.0

TABLE 2. Adults of Hawai‘i. Have you ever been concerned about eating fish in Hawai‘i? Number of concerns by fish consumption. Data Source: Hawai‘i Health Survey (HHS), 2007 and 2008 Average

Variable	N	%
Total Adult Population	972,956	100.0
Number of Fish Concerns Listed		
Sub-Total Concerned	218,416	22.4
1	160,722	16.5
2	46,645	4.8
>2	11,049	1.1
What are your concerns? May list up to six responses.		
Mercury	110,895	11.4
Ciguatera	90,101	9.3
Pollution	66,516	6.8
Parasites	8,870	0.9
Area Caught	7,262	0.7
Type of Fish	5,911	0.6
Fish Freshness	3,844	0.4
Toxins	3,284	0.3
Bacteria	2,843	0.3
Conservation	2,770	0.3
Others	13,687	1.4

TABLE 3. Adults of Hawai‘i. What are your concerns? Data Source: Hawai‘i Health Survey (HHS), 2007 and 2008 Average
Marine Fisheries Review February pp. 16-20.

- Mozaffarian D, Rimm EB. Fish intake, contaminants, and human health: evaluating the risks and the benefits. JAMA 2006 296(15):1885-1899.