

WHI Dietary Nutrient Data

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Department of Health and Human Services

National Institutes of Health

National Heart, Lung, and Blood Institute

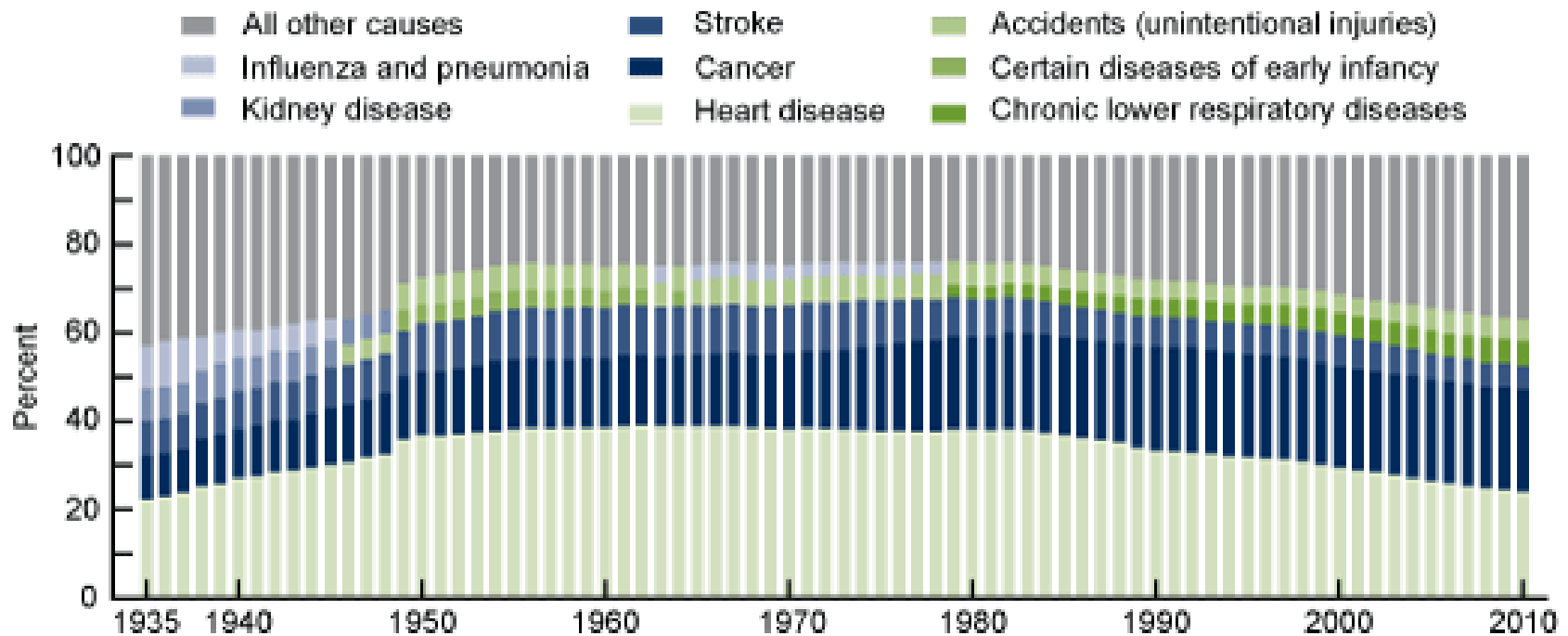
WOMEN'S HEALTH INITIATIVE

Focus on

- Importance of nutrition in WHI
- Nutrition data collected in WHI
- What data are available on the website
- Miscellaneous tips/guides
- How to get involved

Background

- Heart disease and cancer are leading causes of death in the US



Importance of Nutrition

- Improved nutrition could be one of the most cost-effective approaches to address societal, environmental, [health] and economic challenges across the globe today

NIH Interagency Committee on Human Nutrition Research 2016

- A healthy lifestyle is the foundation for cardiovascular health

AHA/ACC Ann Int Med 2014

- 35% of cancers may have a diet-related etiology

National Cancer Institute

Dietary data collected in WHI

- Observational Study
- Dietary Modification Trial
- Long Life Study

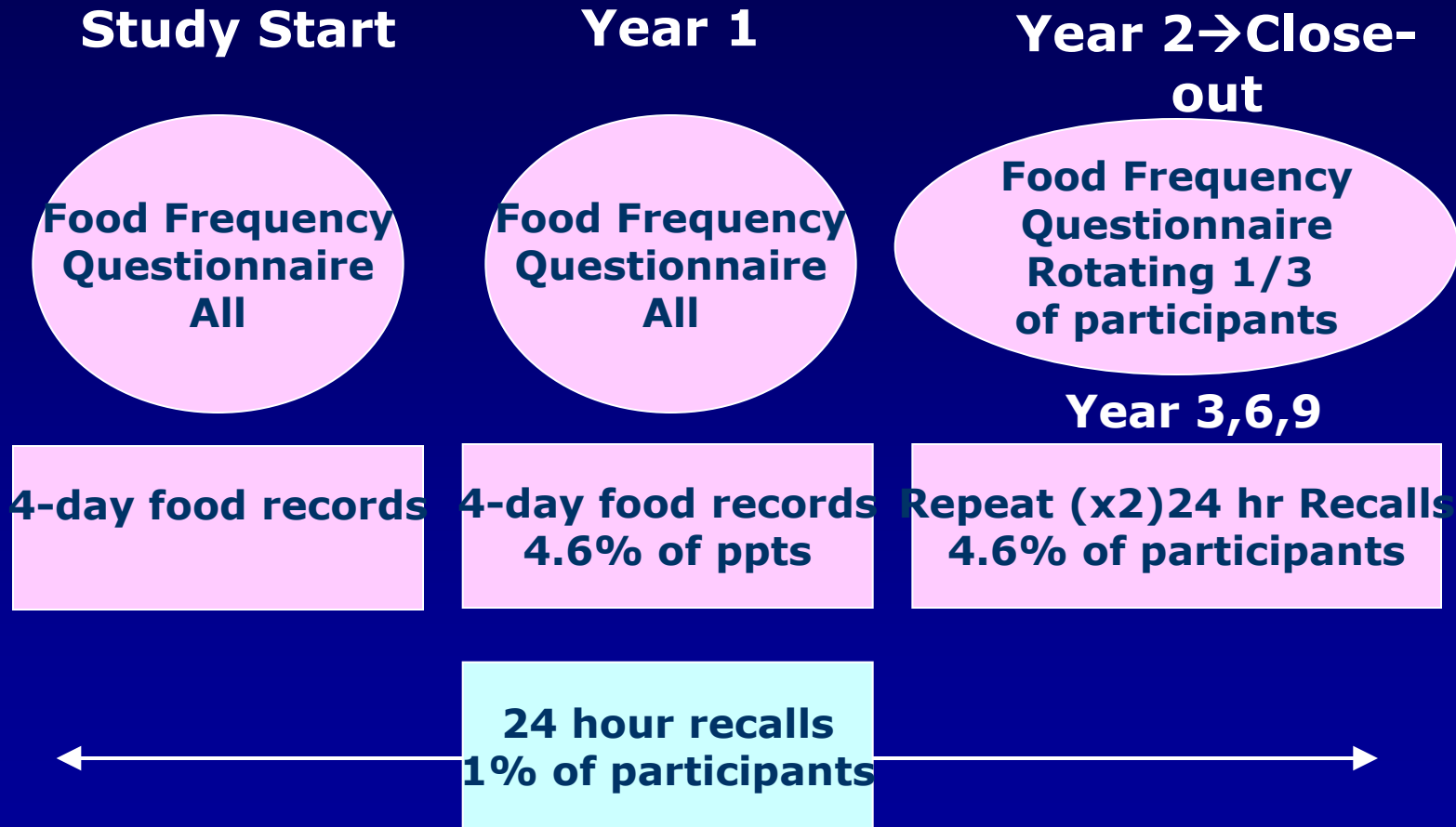
Observational Study

- Food Frequency Questionnaire (FFQ) at baseline (SV1) & year 3 (**Form 60**)
 - Created specifically for WHI
 - English and Spanish, plus Hawaii version
 - 122 line items, 19 adjustment questions, 4 summary questions
- Current Supplements at baseline (SV1) & year 3 (**Form 45**)
 - Multivitamins (w/or w/o minerals), stress supplements, other supplement mixtures, selected single supplements

Dietary Modification CT

- FFQ (**Form 60**) at baseline (SV1)
- FFQ at Year 1
- FFQ at Years 3,6 and 9 in rotating 1/3
- 4 Day Food Records (4DFR) at SV1
- 4DFR in 4.6% sample in Yr 1; ->two 24 Hr Recalls Yrs 3,6 and 9 and extension
- 24-HR Recalls on 1% sample during the intervention
- Current Supplements (**Form 45**) at SV1, Yrs 1,3,6,9

How Was Diet Measured (DM)?

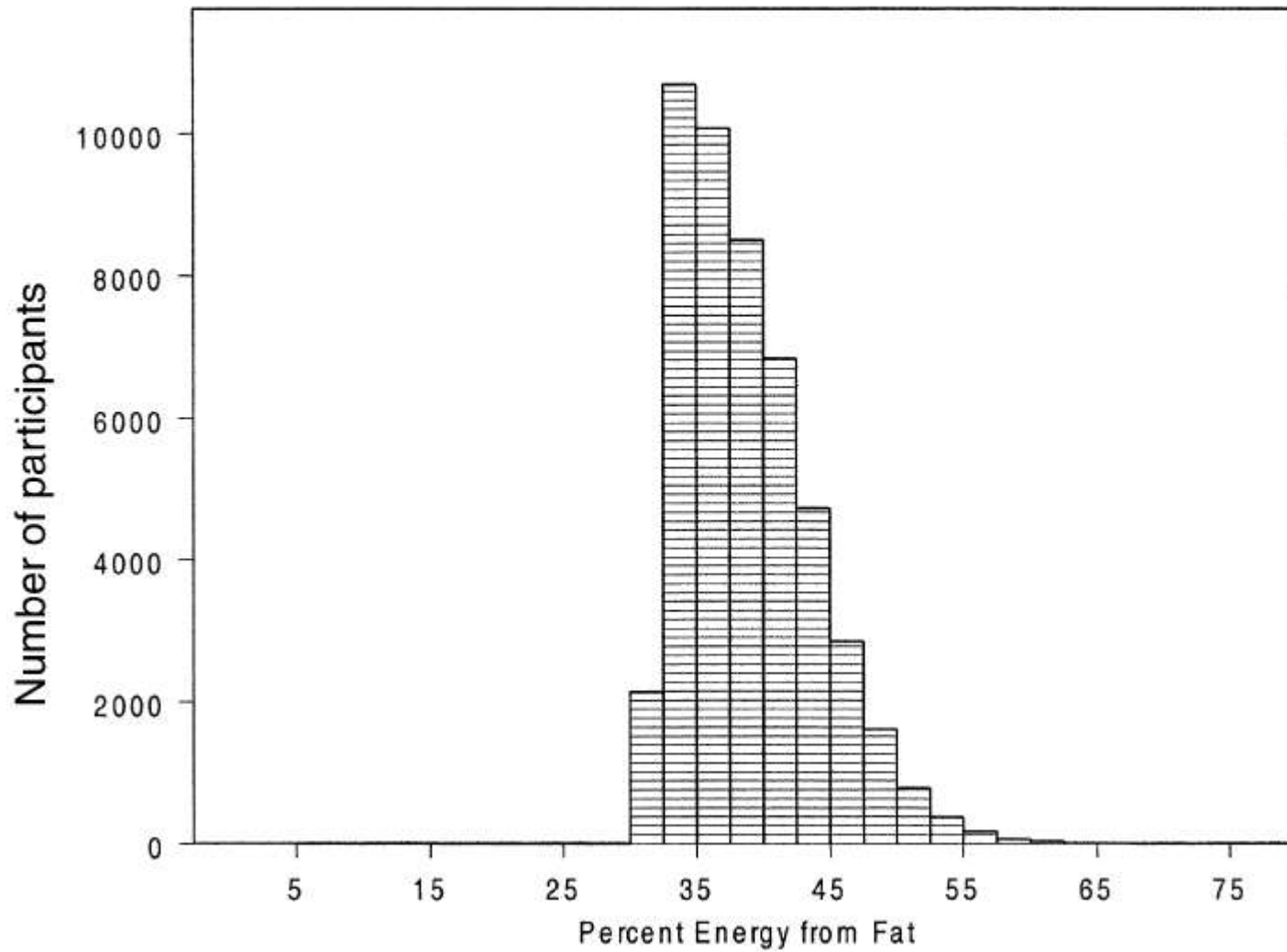


Dietary Modification CT

- Important point!
 - To be eligible for the Dietary Modification CT (which was a low fat dietary pattern), potential participants were **excluded** if their screening FFQ showed <32% kcals from fat
 - This results in a truncated % energy from fat at baseline.
 - Therefore use caution!

A

Baseline for All DM Participants (N=48,836)



Long Life Study (LLS)

- An FFQ was completed by Long Life Study participants. LLS was conducted during the 2010-2015 Extension
- This FFQ is slightly different than the WHI FFQ
 - Reflects more contemporary food items

Nutrition Data Available

- **Form 60 (WHI FFQ)**
 - The supporting food and nutrient database is the Nutrition Data Systems for Research (University of MN), v. 2005
 - Yields per person/day intake of over 140 vitamins, minerals, plant compounds (ie, carotenoids). macronutrients and other compounds (ie, caffeine, alcohol)
 - Line items (coffee) and food groups (ie, red meat, dairy)
 - Data dictionaries & documentation on website

Caveats

- Not all available nutrients in the output are considered reliable or valid
- For example, some nutrients are imputed
- Please read document called:
 - “WHI FFQ Nutrient Database Estimations”
 - This documents provides guidance in the interpretation of the FFQ nutrient variables.

Nutrition Data Available

- **Form 45** (Current Supplements)
 - Vitamin and mineral values for supplements reported (values from labels were directly data entered)
 - Types of supplements used (i.e., multivitamin with minerals)
 - “Total” nutrient (food +supplement) variables must be constructed by each analyst. Most units should match the FFQ units (i.e., mg/day), but check carefully
 - Data dictionaries & documentation on website

Other Nutrient Data

- Four Day Food Record Data (DM only)
 - Some but not all are coded and data entered
 - Could possibly be made available on special request for approved manuscript proposals and/or ancillary studies
- 24 Hour Recall Data (DM only)
 - Could be made available on special request as above
- LLS FFQ – not posted, but results may be available for use as above

Special Analysis Tools/Guides

- Much interest in dietary patterns and disease outcomes in WHI
- What are dietary patterns?
 - “The quantities, proportions, variety, or combination of different foods, drinks and nutrients (when available) in diets and the frequency with which they are habitually consumed”
- NIH 2016 National Nutrition Research Roadmap has identified a need for research on dietary patterns

Commonly applied methods to identify dietary patterns

(slide courtesy of NCI Dietary Patterns Methods Project)

Theoretically
or index
driven

Healthy
Eating Index
(HEI)

DASH Score

Data driven
by
predictor(s)

Factor
analysis,
principal
component
analysis
(PCA),
cluster
analysis

Data driven
by
response(s)

Reduced
rank
regression
(RRR)

Dietary Patterns from Indices

FACTS ABOUT

The DASH Eating Plan

Research has shown that diet affects the development of high blood pressure or hypertension (the medical term). Recently, diet studies showed that blood pressure can be lowered by following a particular eating plan called the Dietary Approaches to Stop Hypertension (DASH) eating plan. — and making the process of it more convenient.

While each separate food item has its own contribution to the overall diet, it is the combination of the eating plan that is linked to lower blood pressure. The DASH eating plan may help prevent the development of high blood pressure.

This fact sheet, based on the DASH eating plan, offers advice on how to follow the DASH eating plan and reduce the amount of sodium you consume. It offers tips on how to store and use the eating plan, as well as a week's worth of sample recipes. The eating plan is based on a diet of whole grains, fruits, vegetables, low-fat dairy products, and lean meats. It is based on the Dietary Approaches to Stop Hypertension (DASH) eating plan. — and making the process of it more convenient.

These diets, based on the DASH eating plan, are especially beneficial for people with high blood pressure. For the complete information on the DASH eating plan, visit the website: www.nhlbi.nih.gov/health/heart/healthy_eating/dash_eating_plan/

Examine indices

Healthy Eating Index

Wine in moderation

Physical activity

Source: National Scientific Health Council, Hellenic Ministry of Health, available at: www.nhs.uk/health/04/040404a.html

	HEI-2010	AHEI-2010	aMED	DASH
Components Scores	100	110	9	8-40
Vegetables	+	+	+	+
Fruit	+	+	+	+
Nuts		+	+	+
Legumes			+	
Fish	+		+	
Whole grains	+	+	+	+
Total protein foods	+			
Dairy	+			+
Oils/fats	+	+	+	
Alcohol		+	+	
Red & processed meat		(+)	(+)	(+)
Refined grains	(+)			
Empty calories	(+)			
SSB & fruit juice		(+)		(+)
Sodium	(+)	(+)		(+)

Dietary Patterns in WHI

- The WHI website now provides the 32 food groupings called MPEDs (for MyPyramidEquivalents)
- HEI-2005 components are available, computed from the MPEDs
- Guidance and documentation is provided for using MPEDs to create the AHEI-2010, aMed, DASH and HEI-2010
- Read the detailed documentation

Special Analysis Tools

- Two major WHI Ancillary Study (the Nutritional Biomarkers Study and the Nutrition and Physical Activity) have used recovery biomarkers to better understand the measurement properties of the self-report data in WHI (FFQs, 4DFR and 24 Hr recalls)
- We have good and consistent data to show systematic mis-reporting of energy, protein, sodium and potassium (references on website)

Special Analysis Tools

- Dr. Ross Prentice & the NBS/NPAAS Teams developed regression calibration equations to correct for systematic misreporting
- WHI manuscripts where the **primary** dietary exposure is energy (kcal/d), protein (g/d), protein density (%energy from protein), sodium, or potassium, should construct and use the calibrated measures
- Documentation/guides on website

APPENDIX TABLE. Estimates of energy intake (kcal/day) obtained by self-reported food frequency questionnaire, a biomarker (total energy expenditure), and a calibrated food frequency questionnaire, according to body mass index category, Women's Health Initiative Nutritional Biomarkers Study, 2004–2005*

Body mass index † category	Self-reported FFQ ‡		Total energy expenditure		Calibrated FFQ	
	Geometric mean	IQR ‡	Geometric mean	IQR	Geometric mean	IQR
Normal (<25.0)	1,407	1,157–1,759	1,894	1,714–2,083	1,912	1,853–1,980
Overweight (25.0–29.9)	1,462	1,196–1,837	2,043	1,904–2,232	2,028	1,962–2,103
Obese (≥30)	1,454	1,161–1,897	2,213	2,034–2,415	2,247	2,156–2,338

* Note that the difference between FFQ energy intake (self-report) and total energy expenditure (biomarker) increases as body mass index increases. The biomarker-calibrated estimates, for the same women, correct for the measurement error using the model shown in table 4.

† Weight (kg)/height (m)².

‡ FFQ, food frequency questionnaire; IQR, interquartile range (25th–75th percentiles).

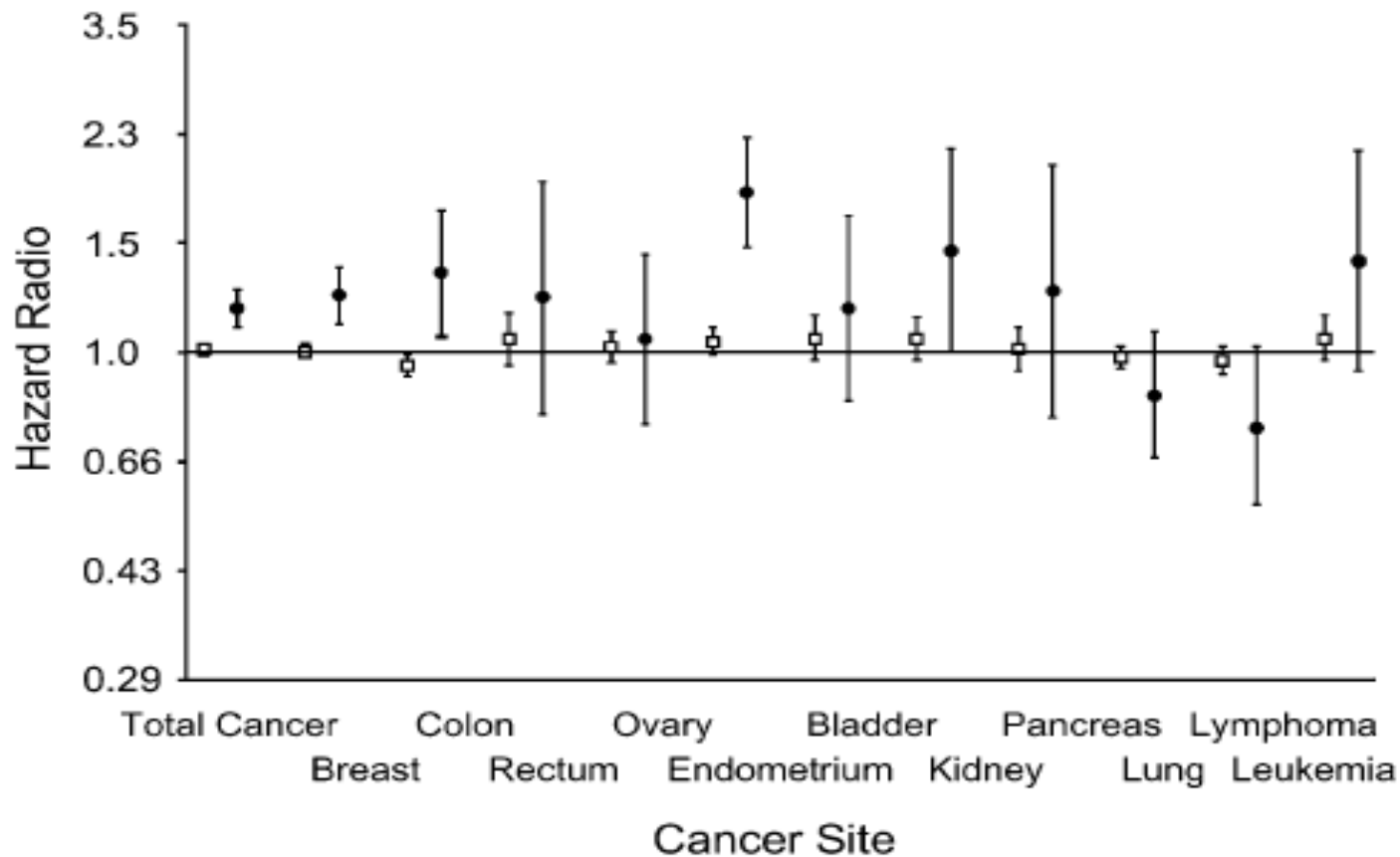


Figure 1. Estimated hazard ratios and 95% confidence intervals for a 20% increase in energy consumption (kcal/day), from combined analysis of data from the Women's Health Initiative dietary modification trial comparison group and observational study, without and with biomarker calibration of consumption, 1993–2005. Unfilled square, uncalibrated; filled circle, calibrated.

How to get involved

- Nutrition/Energy Balance Scientific Interest Group (SIG)
- Meets first Friday of each month at 10 am Pacific Time; contact Marian Neuhouser if interested in joining
- Priority is to discuss ideas/topics for manuscripts and ancillary studies
- Check out the WHI website!

Questions?
