



The Economics of Whole Grain and Public Health – The Impact and Application of Eating More Whole Grains

November 16, 2021

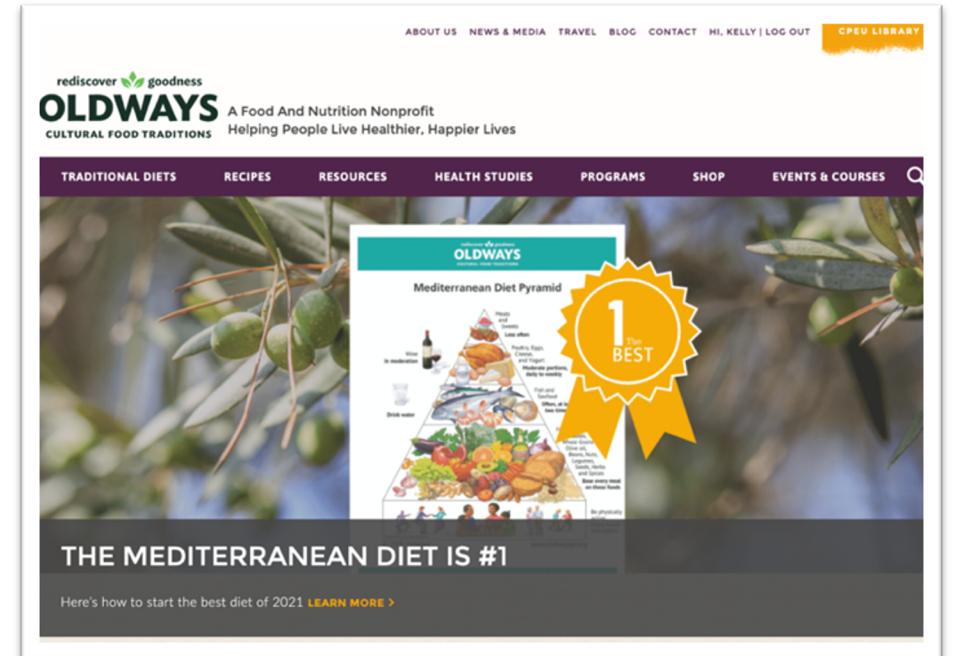


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General Mills



About Oldways

- Nutrition nonprofit founded in 1990
- **Mission:** To inspire people to embrace the healthy and sustainable joys of the old ways of cooking and eating
- **Best Known for** Creating the Whole Grains Council and Whole Grain Stamp, Culinary Travel, Creating the Mediterranean Diet Pyramid



Housekeeping


- Attendees will receive an email within ONE WEEK with **CPEU certificate, slides, and recording**
- Visit **oldwayspt.org/CPEU** to register for upcoming webinars or view recordings of previous webinars
- Please submit any questions using the CHAT function in Zoom
- Thank you to The General Mills Bell Institute for Health & Nutrition for sponsoring this session!

Next Webinar: 1/12 at 2PM ET

Webinar

Brain Health & The Mediterranean Diet

With Dr. Samara Sterling & Amber Pankonin, MS, RD, LMNT



January 12
2:00 PM E.T.

OLDWAYS

Speaker



Kevin Miller, PhD
Principal Scientist
General Mills

Disclosures: Employee of General Mills



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Speaker



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Allison Yoder, MA, RDN, LD

Nutrition in Food Retail Program Development Fellow
Academy of Nutrition and Dietetics Foundation

Disclosures: The Academy Foundation's "Leveraging RDNs in the Food Retail Environment to Improve Public Health" project funded through a grant from Walmart; The Aspen Institute "Food is Medicine" advisory board member; Employee of Academy of Nutrition and Dietetics Foundation

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The Economics of Health & Whole Grains



Kevin Miller, PhD



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Whole Grain Health Economics working group

Jan de Vries (NL), Alexandra Meynier (FR), Gabriel Masset (CH), Patrick Detzel (CH), Henry Maina (FI), YiFang Chu (US), Janne Martikainen (FI), and Kevin Miller (US)



<http://www.wholegraininitiative.org/en/>



Communication

Cardiovascular Healthcare Cost Savings Associated with Increased Whole Grains Consumption among Adults in the United States

Mary M. Murphy ^{1,*},[†] and Jordana K. Schmier ²,[†]



Article

Type 2 Diabetes-Related Health Economic Impact Associated with Increased Whole Grains Consumption among Adults in Finland

Janne Martikainen ^{1,*}, Kari Jalkanen ¹, Jari Heiskanen ¹, Piia Lavikainen ¹, Markku Peltonen ²,
Tiina Laatikainen ^{2,3,4} and Jaana Lindström ²



Article

Healthcare Cost Savings Associated with Increased Whole Grain Consumption among Australian Adults

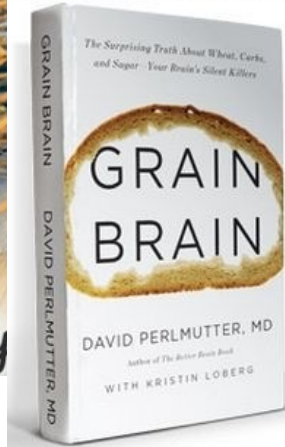
Mohammad M. H. Abdullah ^{1,*}, Jaimee Hughes ² and Sara Grafenauer ^{2,3}



Anti-Grain Noise Confuses the Public



GRAIN-FREE
Diet Benefits Anyone Can Enjoy



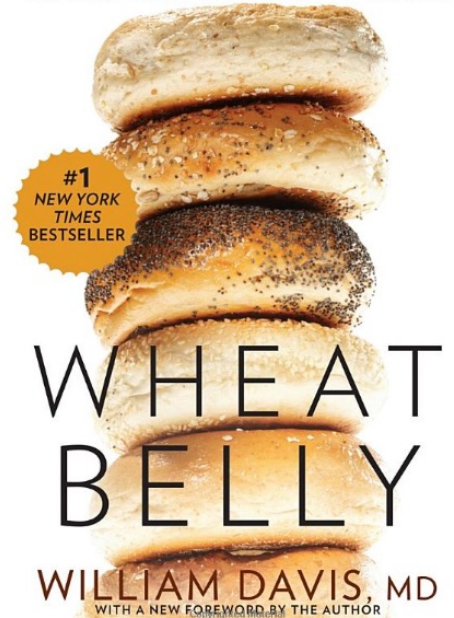
GRAIN BRAIN

The Surprising Truth About Wheat, Carbs, and Sugar - Your Brain's Silent Killers



MORE THAN 1 MILLION COPIES SOLD!

LOSE THE WHEAT, LOSE THE WEIGHT,
AND FIND YOUR PATH BACK TO HEALTH



WHY GRAINS ARE BAD

PART ONE

- HIGH CONCENTRATION OF "TOXIC" LECTINS
- PROLAMINS
most damaging is gluten
- AGGLUTININS
- PLANT'S NATURAL DEFENSE SYSTEM



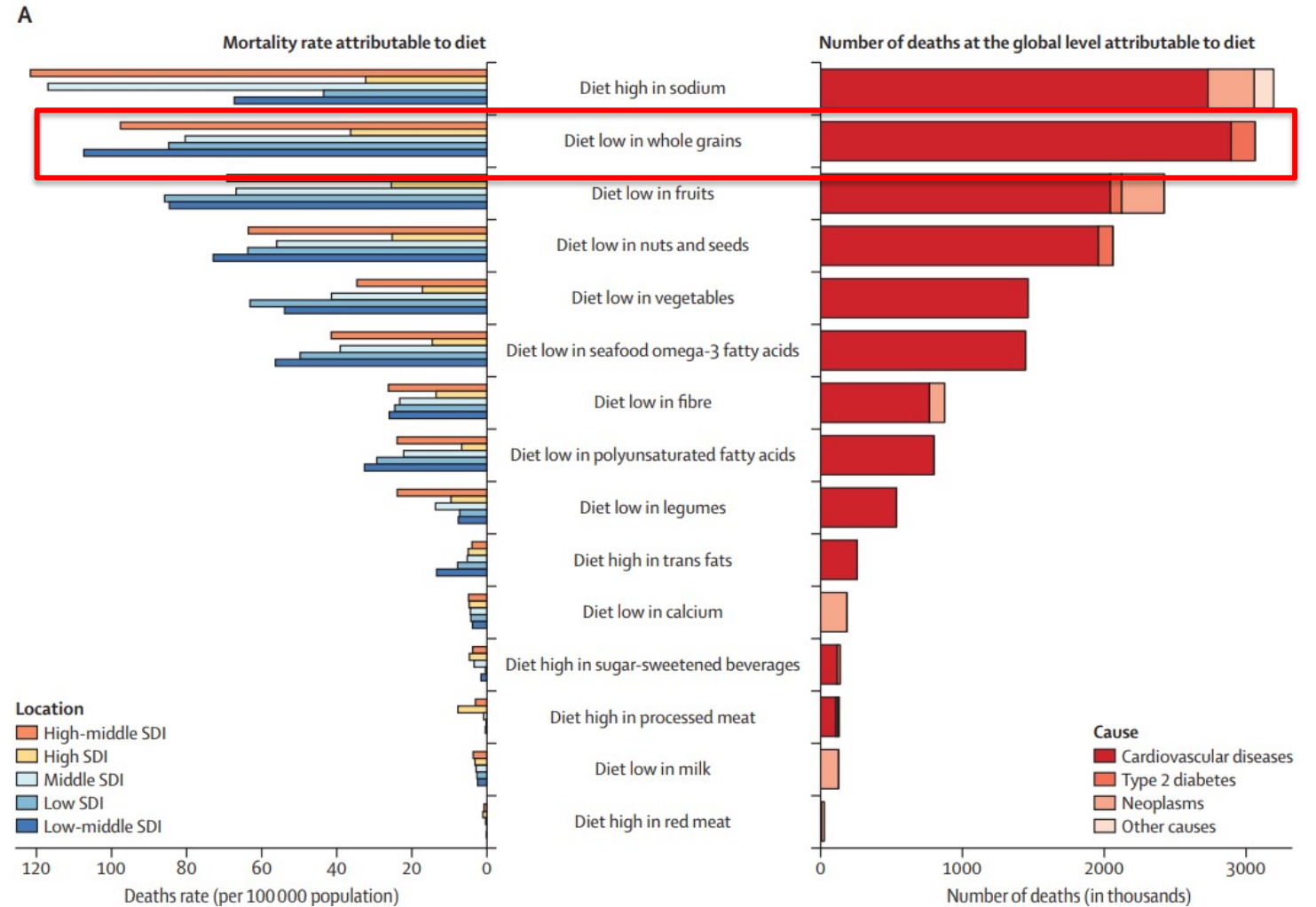
Whole Grains Consistently Associated with Health Outcomes

Studies show a connection between whole grains and better health

Higher WG reduced risk of:

- Cardiovascular disease
- Type-2 Diabetes
- Constipation
- Maybe Colorectal Cancer

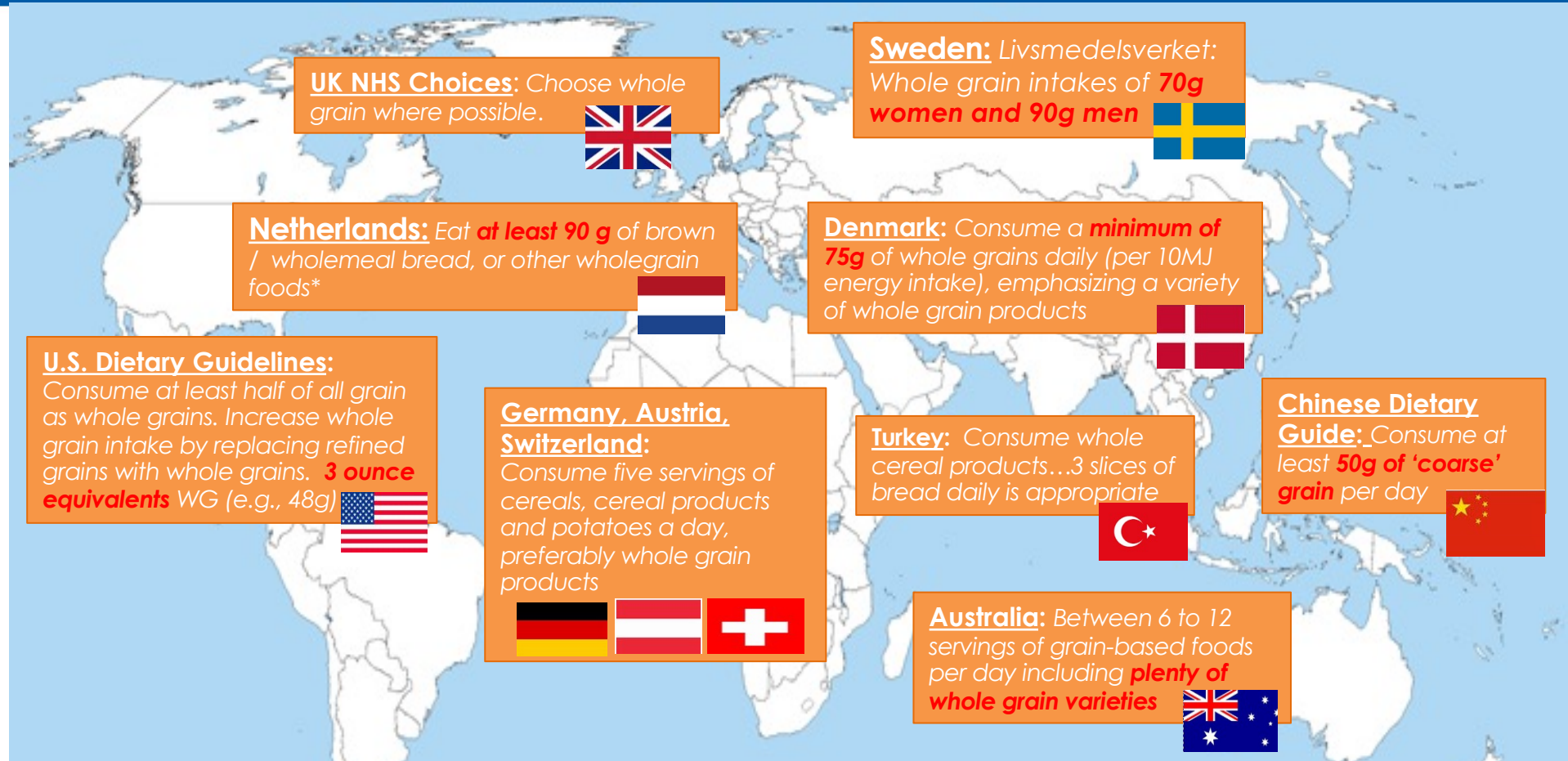
<https://www.hsph.harvard.edu/nutritionsource/what-should-you-eat/whole-grains/>



Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017
Lancet 2019; 393: 1958–72

What is Needed?

...Clear, Consistent Whole Grain Dietary Guidance & Education



Global inconsistency complicate messaging. Few countries have guidance; many are inconsistent and vague

How Do We Influence: Health Economics



A tool to help policy makers evaluate proposed policies and their expected return (\$\$\$ and public health)



Private sector:
Upgrading hospital Standards of Care vs re-admission cost

Public Sector:
Housing the homeless

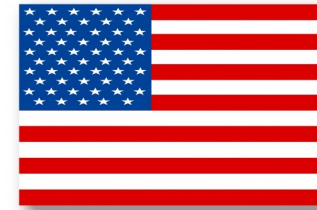
If we do nothing, these 100 people will cost the public service system \$7 million

The cost to change the lives of these 100 people would be \$2.7 million

Economics Can be a Huge Incentive to Take Action

In 2017, healthcare spend was \$3.5 trillion (\$10,739/person) or ~17.9% of US Gross Domestic Product (GDP)

CMS.gov (Centers for Medicare & Medicaid Serv)



\$3.5 trillion

In 2018, health expenditure in Canada was ~\$253.5 billion (\$6,839/person); 11.3% of Canada's GDP.

Canadian Inst Health Information (CIHI)



\$253.5 billion

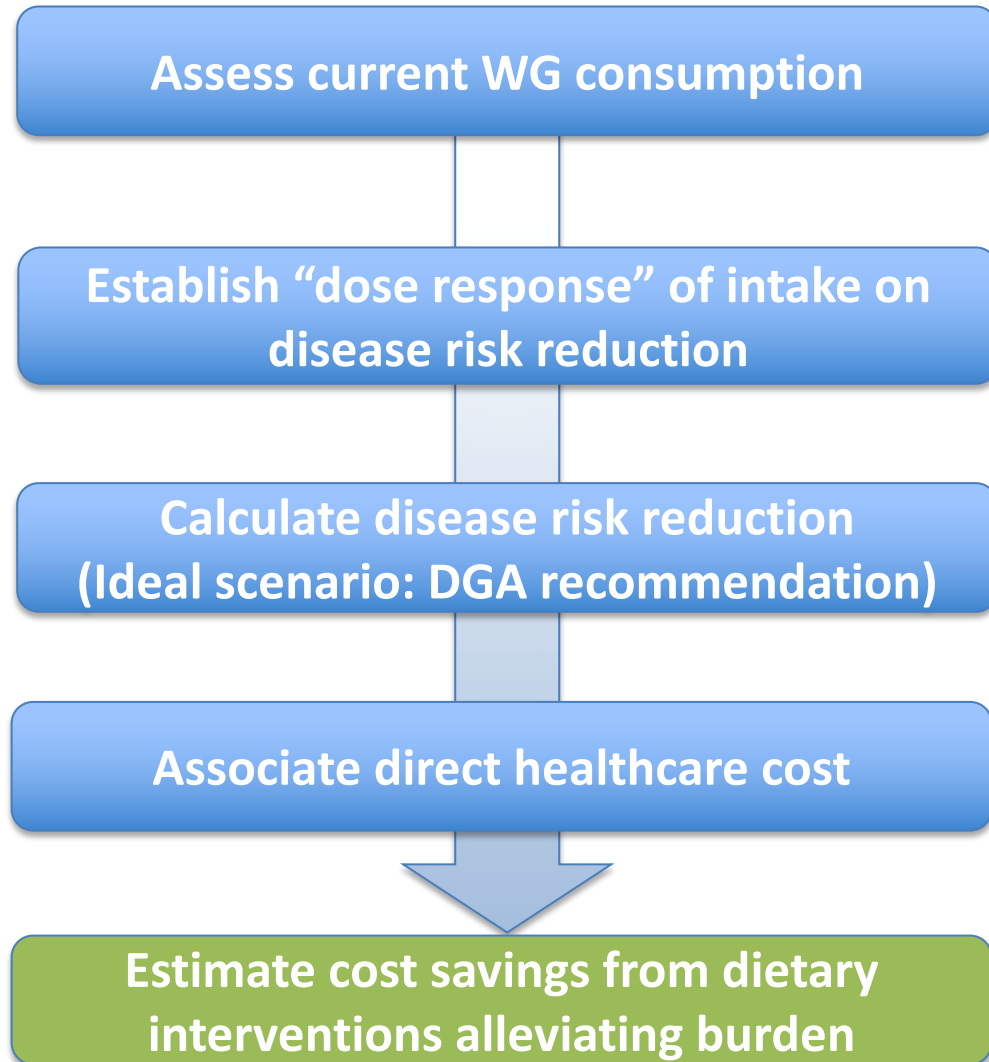
Government and non-government spending on healthcare in UK was £197.4 billion in 2017 (£2,989 /person) or 9.6% of GDP.

www.ons.gov.uk Office of National Statistics

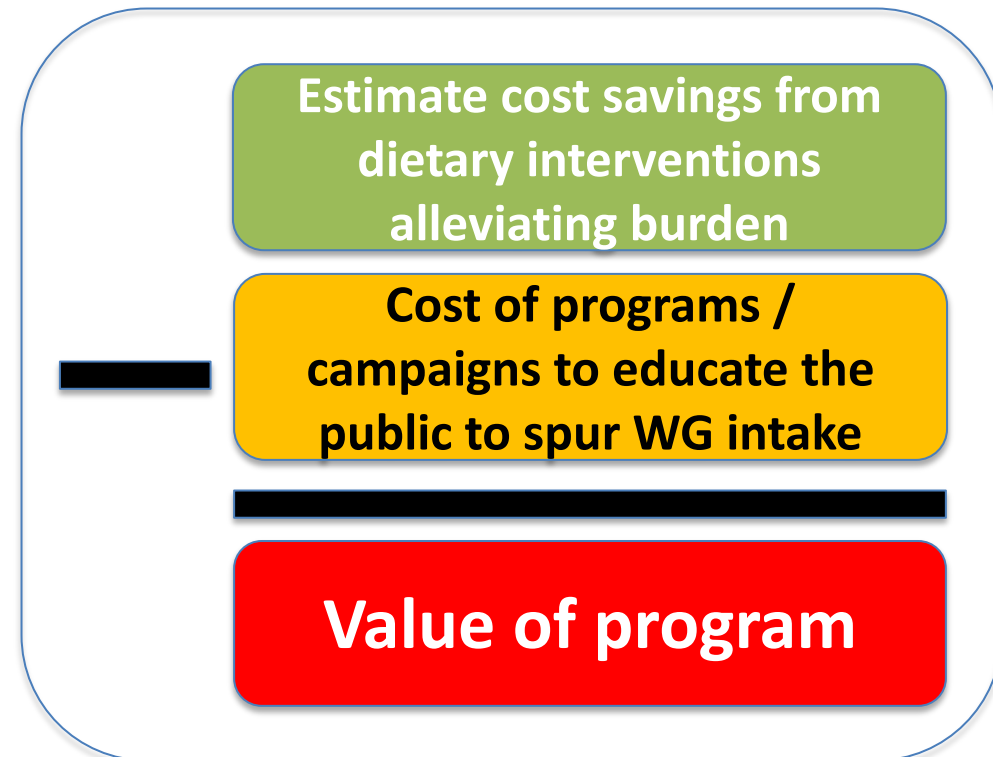


£197.4 billion

Design of the Study



Health Economics Basic Model Approach



Current Whole Grain Consumption

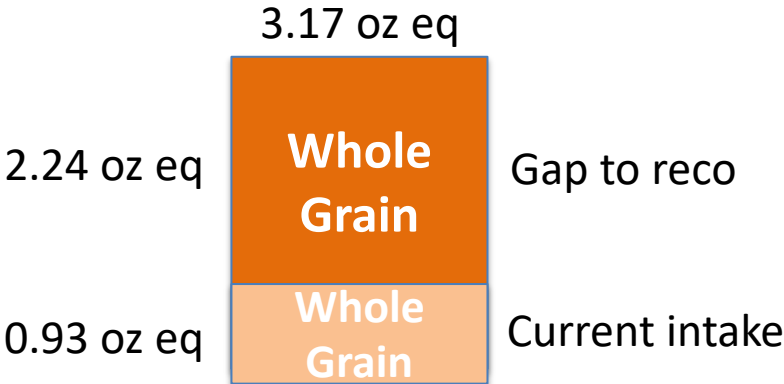
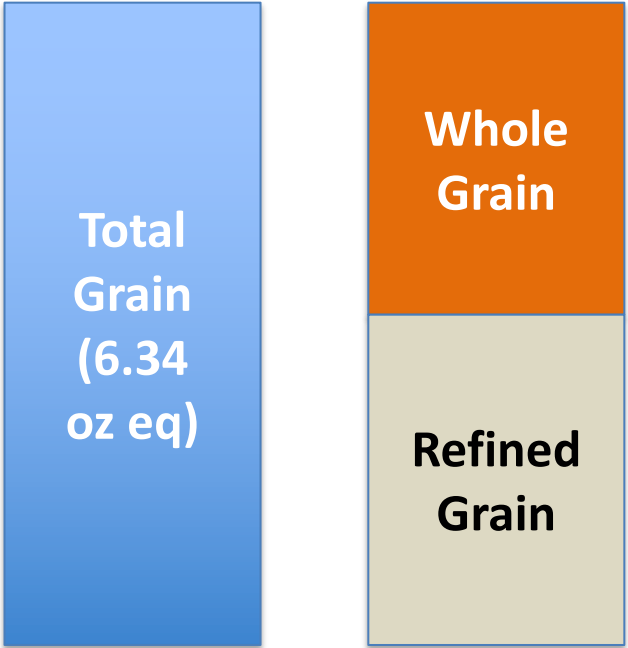


Total grain consumption by U.S. adults (≥ 20 years)
**6.34 oz. equivalents with 0.93 oz-eq as whole grains
 and 5.41 oz-eq/day as refined grains**



$6.34 \text{ oz eq} / 2 = 3.17 \text{ oz eq}$

To meet DGA, adults need
2.24 oz eq WG



U.S. Department of Agriculture. Food Patterns Equivalents Intakes from Food: Mean Amounts Consumed per Individual, by Race/Ethnicity and Age, What We Eat in America, NHANES 2015-2016; U.S. Department of Agriculture: Washington, DC, USA, 2018.

Model Scenarios – What is Reasonable vs Idealistic?

What is the gap between current and Dietary Guidelines reco? Are the scenarios tested reasonably achievable?

Increase in Whole Grains (oz-eq/day)

2.24

2.0

1.0










0.5

0.25

How Much Whole Grain is Enough?

Experts recommend eating six servings of grain per day, at least three of which are whole grain.

A serving* of grain is any of the following: one slice of bread; a half cup of cooked oatmeal, pasta or rice; an ounce of crackers; or a cup of dry cold cereal. These pictures show how easy and delicious it can be to get three or more servings of whole grain each day.

 <p>1 cup oatmeal 2 servings of whole grain</p>	 <p>a sandwich 2 servings of whole grain</p>	 <p>½ cup brown rice 1 serving of whole grain</p>
 <p>1 whole wheat English muffin 2 servings whole grain</p>	 <p>3 cups popcorn 1 serving of whole grain</p>	 <p>1 cup 50% whole grain pasta 1 serving of whole grain</p>
 <p>1 cup whole grain cereal 1 serving of whole grain</p>	 <p>½ round whole wheat pita 1 serving whole grain</p>	 <p>1 cup cooked quinoa 2 servings of whole grain</p>

* a serving of grain is also sometimes called an "ounce equivalent" because it equals about the amount of food that weighs an ounce.

Identify Data to Estimate the Dose-Response



Select robust systematic reviews to estimate 'dose-response' impact of intervention

Outcome	# of Studies	RR (95% CI) per 90 g	RR (95% CI) per 30 g	Change in risk
CVD incidence	2	0.87 (0.78, 0.97)	0.96 (0.93, 0.99)	Decrease
CHD incidence	5	0.84 (0.77, 0.92)	0.95 (0.92, 0.97)	Decrease
Stroke incidence	3	0.84 (0.59, 1.20)	0.95 (0.86, 1.07)	Null

Source: Aune et al., 2016. RR per 30 g was calculated from the reported values assuming a linear relationship.
CVD = Cardiovascular Disease; CHD=Coronary Heart Disease; CI = confidence interval; RR = relative risk

Results indicate 4% reduction in CVD and 5% in CHD per serving WG

Direct Medical Cost Savings Associated with Increased Whole Grain Intake on CVD and CHD

Increase in Whole Grains (oz-eq/day)	Annual Direct Medical Cost Savings (\$ billions) ^a	
	Direct (lower - upper range) based on RR of disease incidence	
	Cardiovascular Disease	Coronary Heart Disease
2.24	21.2 (5.3 - 37.2)	13.6 (8.2 - 21.7)
2.0	19.0 (4.7 - 33.2)	12.1 (7.3 - 19.4)
1.0	9.5 (2.4 - 16.6)	6.1 (3.6 - 9.7)
0.5	4.7 (1.2 - 8.3)	3.0 (1.8 - 4.9)
0.25	2.4 (0.6 - 4.1)	1.5 (0.9 - 2.4)

^aAnnual direct medical costs (inflated to 2018 US dollars):

CVD costs = \$237.1 billion incl outcomes heart disease, hypertension, stroke, and other circulatory conditions

CHD costs = \$121.3 billion incl outcomes CHD, heart failure, part of hypertension, cardiac dysrhythmias, rheumatic heart disease, cardiomyopathy, pulmonary heart disease, and other or ill-defined heart disease (Benjamin et al., 2019; Bureau of Labor Statistics, 2019).

RR normalized to effect per 30 g serving of whole grain assuming linear response (Aune et al., 2016).



TYPE 2 DIABETES-RELATED HEALTH ECONOMIC IMPACT ASSOCIATED WITH INCREASED WHOLE GRAINS CONSUMPTION AMONG ADULTS IN FINLAND.

Dr. Janne Martikainen

Estimate **the T2D-related expected savings* potential and QALY gains** achieved through consumption of whole grains in the Finnish population *without* pre-existing T2D.

Scenario	Current Situation		Scenarios	
	Proportion of whole grain consumers (%)	Number of whole grain servings (n)	Proportion of whole grain consumers (%)	Number of whole grain servings (n)
1	70	1	80	1
2	70	1	70	2
3	70	1	80	2

* The savings potential estimates consider changes in both direct health care and productivity costs related to functional and work capacity.

**Whole grains shall consist of the intact, ground, cracked, flaked or otherwise processed kernel after the removal of inedible parts such as the hull and husk. All anatomical components, including the endosperm, germ, and bran must be present in the same relative proportions as in the intact kernel (Whole Grain Initiative 2020)



Finnish Study: Whole Grain and Diabetes



Economics:

Type-2 Diabetes related costs among Finnish adult (30-79 years) with diabetes almost € 8.3 billion in 10 year or € 22.4 billion in 20 years.

Quality of Life:

80,900 to 276,137 QALYs (Quality Adjusted Life Years) could be gained at the population level due to decreased T2D-related morbidity and mortality at the population level



Finland · Population, total

5.52 million (2019)

About equal to the population of Colorado

Estimated savings: € 0.3 to 4.2 billion



Finnish Study: Whole Grain and Diabetes



Finland - Population, total

5.52 million (2019)

About equal to the population of Colorado

Extrapolate



USA - Population, total

328.2 million (2019)

59 Times Finland's population

Estimated savings: € 0.3 to 4.2 billion

American Diabetes Association estimate

Direct medical costs: \$237 billion

Reduced productivity: \$90 billion

1 Serving WG: \$64 billion Direct savings

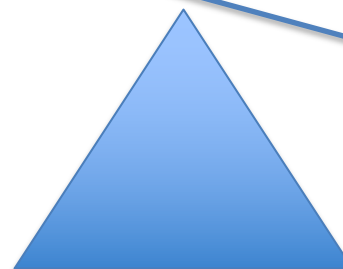
2 Servings WG: \$83 billion Direct savings

\$2.3 Billion

\$64 Billion

Advertising /
Promotions

T2D Savings (1 serv)



How Can We Use This Data?



- **Private Sector:**

- Health insurance, Retailers, and Food Manufacturers can leverage data to create programs

- **Advocacy:**

- Provide compelling rationale for implementing and/or maintaining strong, clear whole grain dietary guidance
- Prioritize recommendations to clients & patients

- **Academics:**

- Demonstrate *potential* for and spur more sophisticated, comprehensive modelling studies
- Identify other health outcomes of interest (e.g., cognitive function)

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Food As Medicine: Connecting Food And Health

Allison Yoder, MA, RDN, LD

Nutrition in Food Retail Program Development Fellow



Presentation Outline



A Changing Health and Well-being Landscape



Food as Medicine Research



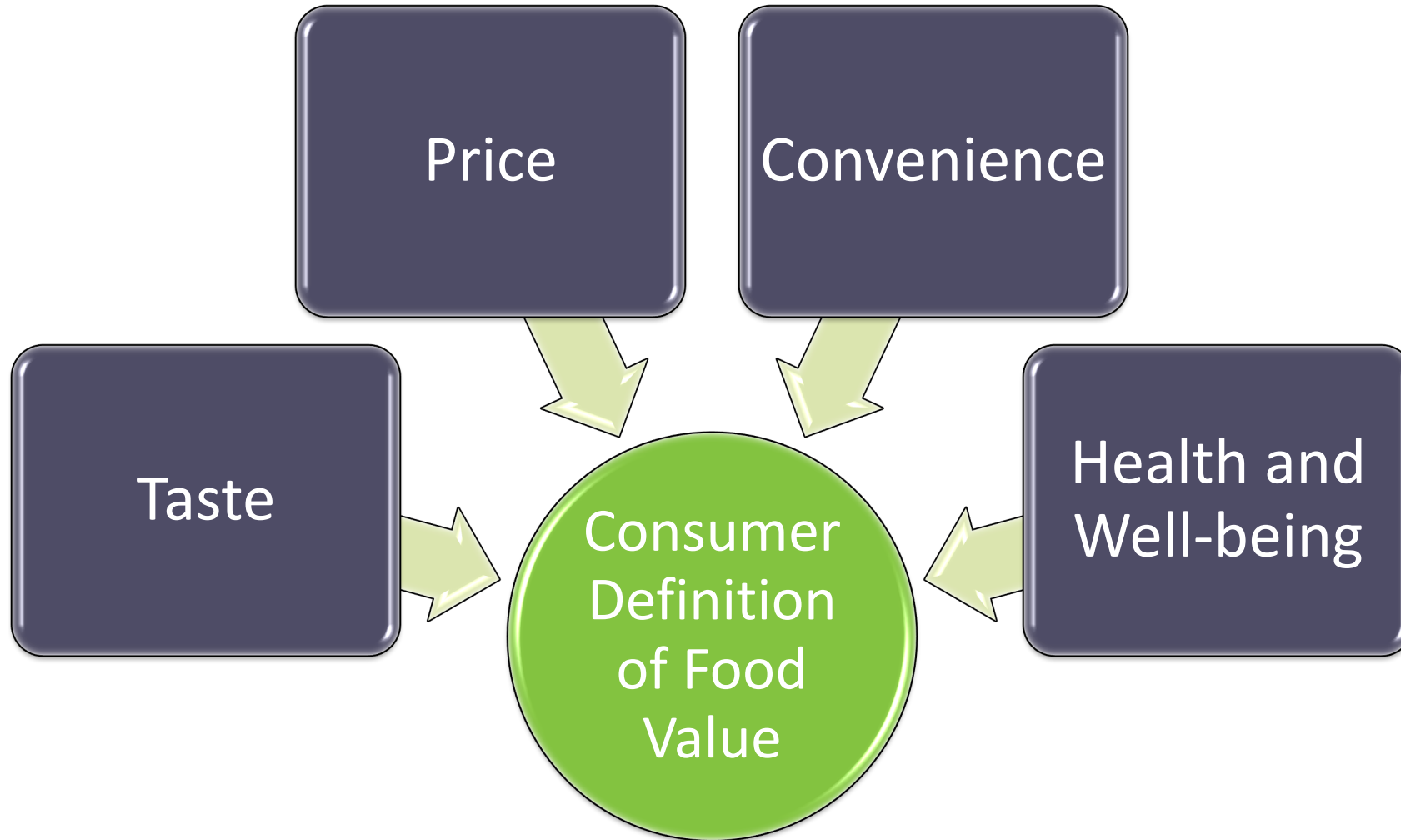
Practical Applications for Registered Dietitian Nutritionists



A Changing Health and Well-being Landscape



Consumers are Prioritizing Health and Well-being



COVID-19 Accelerates Behavior Shifts

- During the pandemic, **consumers are paying more attention** to health strategies:

Personalized
Nutrition

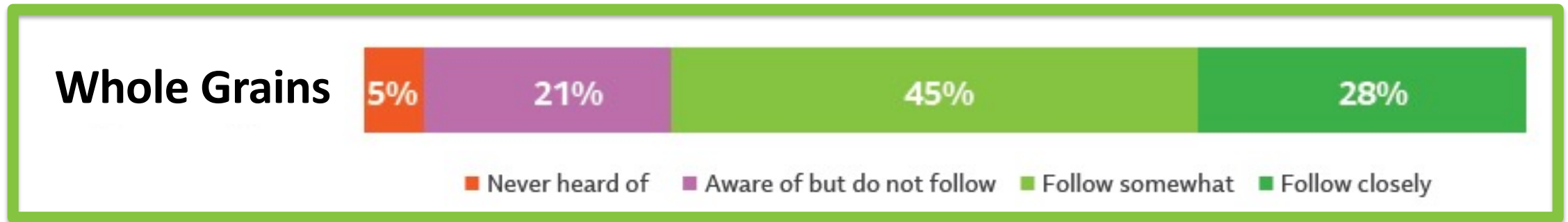
Better for
You

Food as
Medicine

- **35%** of consumers report eating healthier now than before the pandemic.

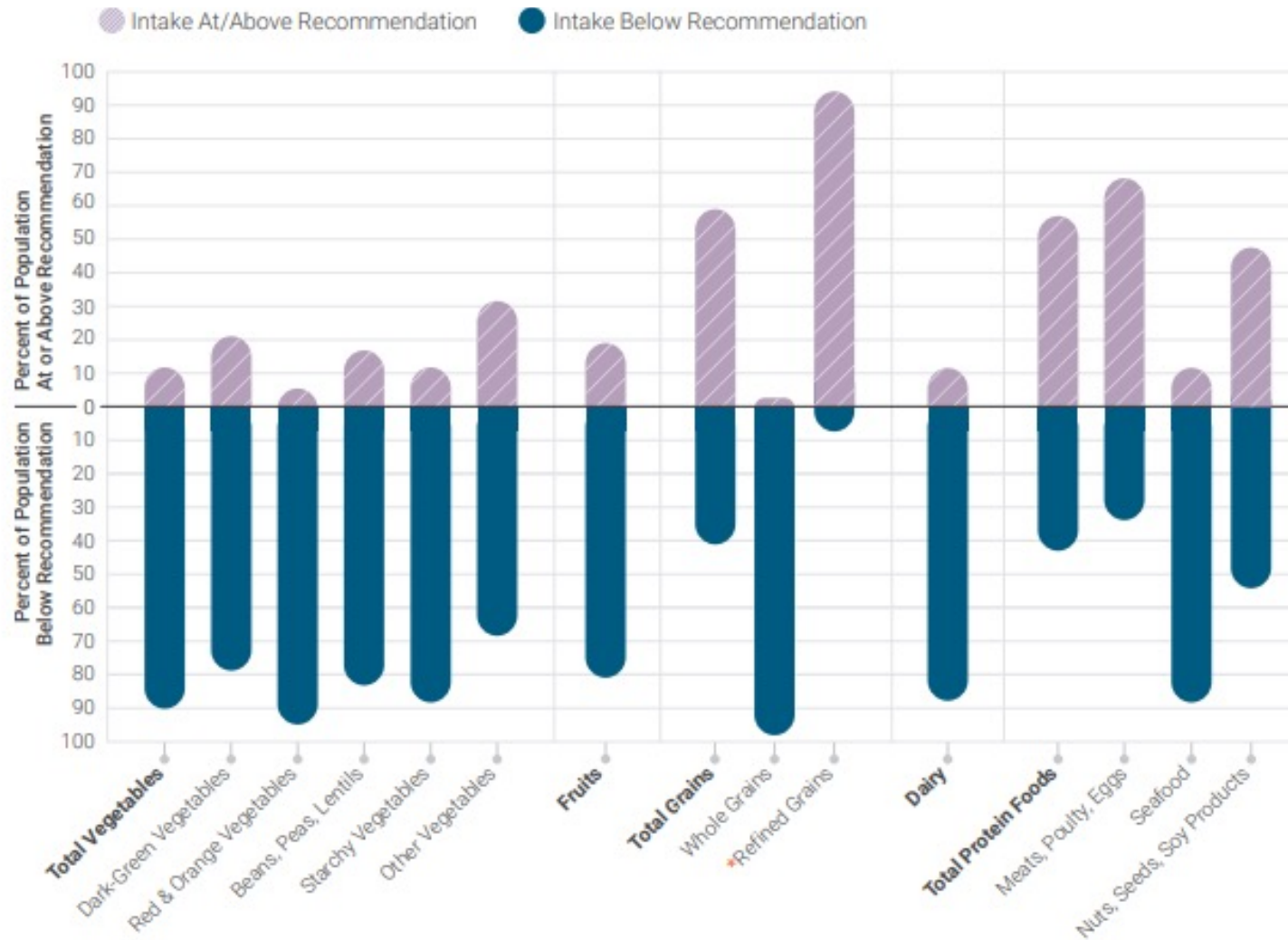
Consumers Seek Benefits from Food Groups

- **Consumers are including food groups** from the Dietary Guidelines for Americans to gain specific health benefits:



- **73%** include whole grains for heart health, diabetes management or dietary fiber benefits.

Whole Grain Intake Below Recommendations



- Majority of Americans are **not meeting recommendations** for whole grain consumption

Barriers/Facilitators of Whole Grains

- Main Barriers to and Facilitators of Whole Grain Consumption

	Kids			Adults		
	Children	Adolescents	Young	Middle-aged	Older	
Barriers + ↓ -	Dislike taste / texture	Poor availability of FCWG	Dislike taste / texture	Cost of FCWG	Cost of FCWG	
	Poor availability of FCWG	Dislike taste / texture	Cost of FCWG	Dislike taste / texture	Difficult to identify FCWG	
	Lack of appeal (appearance / pack / marketing)	Time-consuming to prepare/eat	Difficult to identify FCWG	Difficult to identify FCWG	Dislike taste / texture	
	Difficult to identify FCWG	Lack of appeal (appearance / pack / marketing)	Poor availability of FCWG	Lack of knowledge on nutrition & health benefits	Poor availability of FCWG	
	Lack of knowledge on nutrition & health benefits	Cost of FCWG	Lack of knowledge on nutrition & health benefits	Dietary habits & other family members (children)	Chewing difficulties (institutions)	
Facilitators + ↓ -	↗ sensory appeal	↗ availability of FCWG	↗ sensory appeal	↗ sensory appeal	↗ ability to identify FCWG	
	Incorporate WG in usual and well-liked products	Preference / liking of taste/texture	↗ availability of FCWG	↗ availability of FCWG	↗ sensory appeal	
	Familiarization to FCWG	↗ sensory appeal	Familiarization to FCWG	Familiarization to FCWG	↗ availability of FCWG	
	Preference / liking of taste/texture	Incorporate WG in usual and well-liked products	Preference / liking of taste/texture	Clear labeling of WG on packs	Preference / liking of taste/texture	
	↗ availability of FCWG	↗ variety of FCWG	↗ ability to identify FCWG	Education vs FCWG cooking / preparation	Education vs FCWG cooking / preparation	

Source: Meynier A, Chanson-Rollé A, Riou E. Main Factors Influencing Whole Grain Consumption in Children and Adults-A Narrative Review. *Nutrients*. 2020;12(8):2217. Published 2020 Jul 25.

Barriers/Facilitators of Whole Grains

Barriers

- Dislike taste / texture
- Poor availability
- Difficult to identify
- Lack of knowledge
- Taste

Facilitators

- Increase availability and variety
- Improve sensory appeal
- Reduce purchase cost
- Enhance ability to identify products with whole grains



Food as Medicine Research



Food as Medicine

Food as Medicine is based on the science of connecting food to improved health.

FMI – The Food Industry Association
Defining Food as Medicine in Food Retail

Food as Medicine Definition

Food as preventative medicine to encourage health and well-being



Food as medicine to improve nutrition security



Food as Medicine is a philosophy where food and nutrition aids individuals through interventions that support health and wellness.

Food as medicine in disease management and treatment



Food as medicine to promote food safety



Food as Medicine is a reaffirmation that food and nutrition play a role in:

- Sustaining health
- Preventing disease
- Therapy for those with conditions or in situations responsive to changes in their diet

Food as Medicine Programs in Food Retail



- Produce Prescriptions
- Food Prescriptions



- Coupons
- Vouchers
- Discounted Pricing
- Rebates
- Taxes



- Medically Tailored Meal Programs
- Medically Tailored Food Programs



- Signage
- Displays
- Nutrition Attribute Labeling
- Cooking Demo
- Media Promotions



- Classes
- Store Tours
- Health Screenings
- 1:1 Counseling / MNT
- Employee Wellness

Food as Medicine Programs in Food Retail



Utilizing a combination of any of these Food as Medicine program models will increase a food retailer's success in producing both:

RETURN ON INVESTMENT
&
POSITIVE HEALTH OUTCOMES

Food as Medicine Retail Nutrition Framework

PROMOTE HEALTH AND WELL-BEING



Target Shoppers

Families · Aging Healthfully · Employees

Recommended Program Models

Incentive Programs
Personalized Nutrition Education
Path-to-Purchase Marketing

MANAGE CHRONIC DISEASE



Target Shoppers

Individuals with
Diabetes · Obesity · Heart Disease

Recommended Program Models

Prescription & Incentive Programs
Personalized Nutrition Education
Medically Tailored Nutrition

IMPROVE FOOD AND NUTRITION SECURITY



Target Shoppers

SNAP & WIC Beneficiaries
Low-Income Households

Recommended Program Models

Incentive & Prescription Programs
Incentive & Personalized Nutrition Education



Practical Applications for Registered Dietitian Nutritionists



Review: Whole Grain Barriers / Facilitators

Barriers

- Dislike taste / texture
- Poor availability
- Difficult to identify
- Lack of knowledge
- Taste

Facilitators

- Increase availability and variety
- Improve sensory appeal
- Reduce purchase cost
- Enhance ability to identify products with whole grains

Practical Applications for RDNs

PROMOTE HEALTH AND WELL-BEING



Target Shoppers
Families · Aging Healthfully · Employees

Recommended Program Models
Incentive Programs
Personalized Nutrition Education
Path-to-Purchase Marketing

- **Meal Solutions with Whole Grains**

Incentive Program

Feature recipe with whole grain ingredients on sale / weekly ad



Personalized Nutrition Education

Offer cooking classes or store tours (virtual or in-person events)



Path-to-Purchase Marketing

Bundle recipe ingredients with a display or signage

Practical Applications for RDNs

MANAGE CHRONIC DISEASE



Target Shoppers

Individuals with
Diabetes · Obesity · Heart Disease

Recommended Program Models

Prescription & Incentive Programs
Personalized Nutrition Education
Medically Tailored Nutrition

- Patient Discharge Program / Education

Medically-Tailored Nutrition

Tailored meals or boxes of food containing whole grain products



Personalized Nutrition Education

Medical nutrition therapy with a registered dietitian



Incentive Program

Meal or food vouchers

Practical Applications for RDNs

- **Community Partnerships**

Personalized Nutrition Education

Health screenings



Prescription Program

Prescribe specific whole grain foods



Incentive Program

Provide coupon with prescription

**IMPROVE FOOD AND
NUTRITION SECURITY**



Target Shoppers
SNAP & WIC Beneficiaries
Low-Income Households

Recommended Program Models
Incentive & Prescription Programs
Incentive & Personalized Nutrition Education

Additional Resources

- **Resource Page:**
www.eatrightfoundation.org/foodasmedicine
- **Reports**
 - Food as Medicine Retail Nutrition Landscape Paper
 - Scoping Review
 - Food as Medicine Opportunity in Food Retail
- **Continuing Education**
- **Video**
- **Coming Soon!**
 - Program Evaluation Guide
 - Certificate of Training Program
 - Dietetic Internship Curriculum
 - Food as Medicine Feasibility Study



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Thank You!

Questions & Answers



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rediscover  goodness
OLDWAYS