



Whole Grains: A Game Changer for Public and Planetary Health

Inclusion of whole grains as part of sustainable and healthy diets

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WHOLE GRAIN AND HEALTH

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COMPREHENSIVE REVIEWS

Whole grain consumption and human health: an umbrella review of observational studies

Maria Tieri^a, Francesca Ghelfi^{b,c}, Marilena Vitale^d, Claudia Vetrani^d, Stefano Marventano^e, Alessandra Lafranconi^{f,g}, Justyna Godos^h, Lucilla Titta^a, Angelo Gambera^a, Elena Alonzo^a, Salvatore Sciacca^a, Gabriele Riccardi^d, Silvio Buscemi^d, Daniele Del Rio^{c,m,n}, Sumantra Ray^{o,p,q}, Fabio Galvano^a, Eleanor Beck^{r,s} and Giuseppe Grosso^{c,t,u}

Level of evidence ^a	Whole grains
Convincing	Association with decreased risk of cancer (colorectal), T2DM
Probable	None
Possible	<ul style="list-style-type: none"> Association with decreased risk of cancer (colon), CHD (fatal), mortality (CVD) Association with increased risk of cancer (prostate)
Limited	Association with decreased risk of mortality (cancer), CHD (any) ^r , mortality (all-cause), stroke (total) ^r
Insufficient	Association with decreased odds of adenoma (colorectal), cancer (pancreas)
No evidence	No association with risk of cancer (rectum), stroke (fatal)

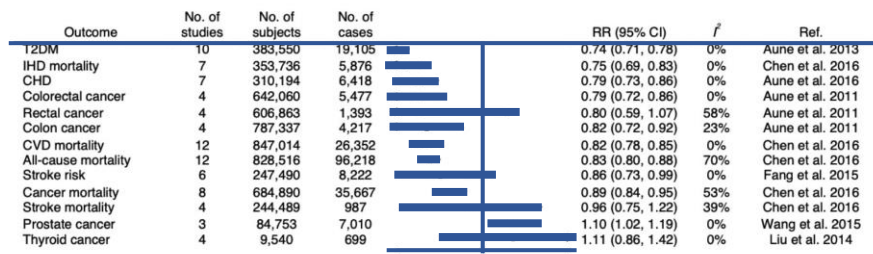










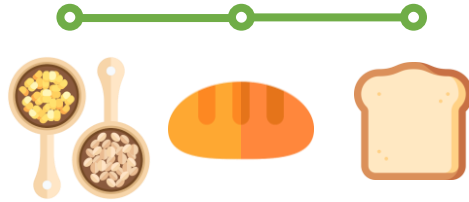
Figure 2. Summary results from meta-analyses of prospective cohort studies on whole grain consumption on various health outcomes included in umbrella review.

SOURCE: Tieri et al. Int J Food Sci Nutr (2020)

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WHOLE GRAIN AND HEALTH

DEHULLING: Inedible outer hull removed	 All grains
SPROUTING: Partially germinating the seed	 Sprouted brown rice
CRACKING: Milled into smaller pieces	 Cracked wheat
CUTTING: Sliced into smaller pieces	 Steel-cut oats
ROLLING: Steamed and rolled flat	 Rolled oats
PUFFING: Inflated with air, using high pressure and steam.	 Puffed wheat cereal
GRINDING: Pulverized into a meal or flour	 Flour
PEARLING/ POLISHING: Strips away bran and germ	 White flour



Which level of processing?

- Ingredient bill
- Energy density

SOURCE: Seal et al. Compr Rev Food Sci Food Saf (2021)

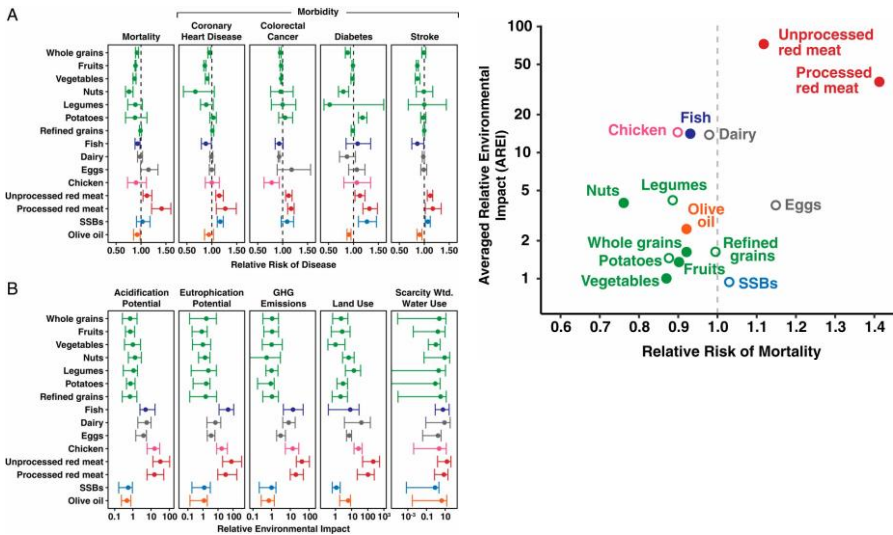
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WHOLE GRAIN AND SUSTAINABILITY

Multiple health and environmental impacts of foods

Michael A Clark^{a,b,c,1}, Marco Springmann^{a,b}, Jason Hill^a, and David Tilman^{a,1}



SOURCE: Clark et al. PNAS (2019)

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WHOLE GRAIN CONSUMPTION

Dietary Intake of Foods and Nutrients by Country

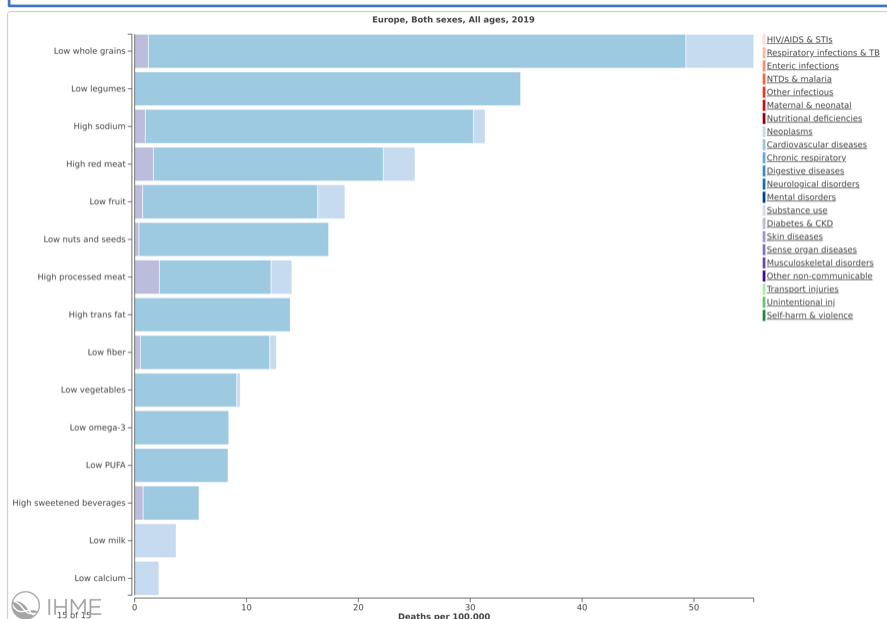
Dietary Factor

whole grains (g/day) ▾



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HEALTH IMPACT OF NUTRITIONAL RISK FACTORS IN EUROPE



SOURCE: GBD Compare. <https://vizhub.healthdata.org/gbd-compare/>

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POLICY INSTRUMENTS

Table 7. Examples of implemented policies to address whole grain intake
(Policies that specifically address fibre intake are described in Dietary Fibre in this series.)

Area*	Type	Description	Country
GUIDE CHOICE THROUGH INCENTIVES		<ul style="list-style-type: none"> The Healthier US School Challenge aimed to improve children's health. In 2010 monetary incentive awards were available for schools that implemented whole grain-rich criteria. There were 3 levels of award of distinction depending on the extent to which schools met the whole-grain rich criteria. 	USA ¹⁴
		<ul style="list-style-type: none"> Various EU Member States school food policies include standards to promote whole grain intake at schools by increasing the availability of whole grain products. For example, Bulgarian standards suggest that whole grain options for bread should be available at least twice per week. 	EU ¹⁵
ENABLE OR GUIDE CHOICE BY CHANGING DEFAULT	School food policies	<ul style="list-style-type: none"> The German Nutrition Society (DGE) has set voluntary guidelines on quality standards for school meals in Germany, which require that in a 20-day serving plan, whole grain should be served at least 4 days (that would correspond to one serving per week). These guidelines were implemented as a legal requirement in two German Länder (Berlin and Saarland). Swiss food-based standards recommend that 50% of the bread offer is wholegrain. 	Germany ¹⁴ Switzerland ¹⁵
		<ul style="list-style-type: none"> The grain requirements implemented for the National School Lunch Program (NSLP) and the School Breakfast Program (SBP) are: <ul style="list-style-type: none"> for lunch, all grains must meet the whole grain-rich criteria; for breakfast, all grains must meet the whole grain-rich criteria. 	USA ¹⁴
	Retail initiatives	<ul style="list-style-type: none"> As part of the 'Healthier Dining Programme' food operators are encouraged to offer lower calorie meals and use healthier ingredients such as oils with reduced saturated fat content, and/or whole grains without compromising taste and accessibility. 	Singapore ¹⁴
		<ul style="list-style-type: none"> Manufacturers can make statements about whole grains on the label of their products such as '100% whole grain' (as percentage) or '10 grams of whole grains' provided that the statements are not false or misleading and do not imply a particular level of the ingredient, i.e., 'high' or 'excellent source'. Additionally, manufacturers may use health claims on their product labels for qualifying foods. 	USA ¹⁴
PROVIDE INFORMATION	Voluntary labelling	<ul style="list-style-type: none"> The Keyhole label emphasises the better choice of foodstuffs based on certain criteria. Keyhole label can be used for whole grain products such as flour, rice, grain cereals and breakfast cereals when certain nutrient content criteria for each food category are fulfilled, e.g. rice containing 100% whole grain and fibre at least 3 g/100 g. 	Denmark, Norway, Sweden ¹⁷

* Based on the Nutfield intervention ladder as described in *Public Health: ethical issues* from the Nutfield Council on Bioethics, Nov 2007.
SOURCE: JRC. [Health Promotion and Disease Prevention – Whole grains \(2017\)](#)

They can be generally categorized in actions that aim to

- (i) increase the awareness of consumers regarding the benefits of whole grain and also provide information on how to recognize the appropriate products,
- (ii) make the healthy option available by improving the food environment, e.g. increasing the availability of whole grains at school meals,
- (iii) implement financial incentives to promote the purchase of healthful foodstuffs by consumers.

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Thank you for your attention

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