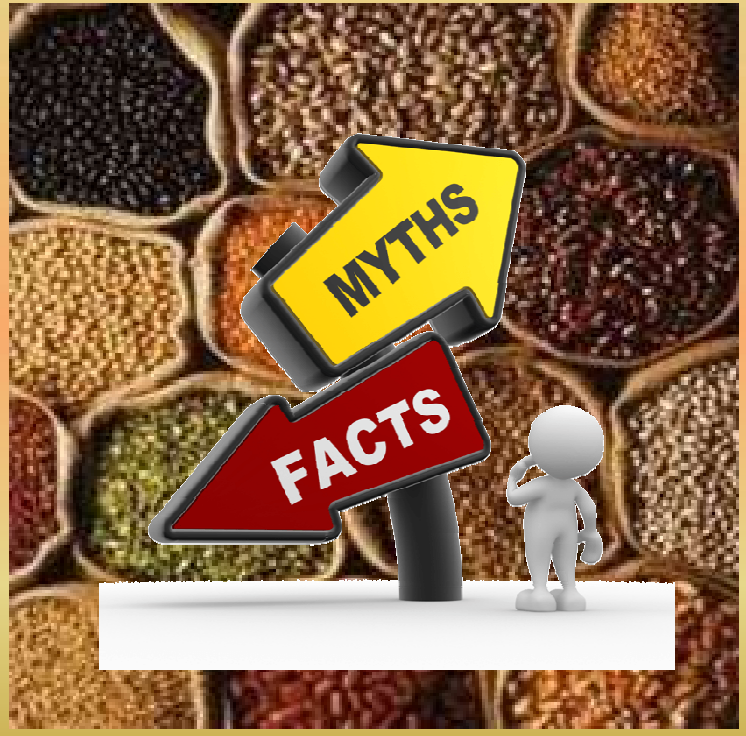
MYTHS & FACTS OF WHOLE GRAINS



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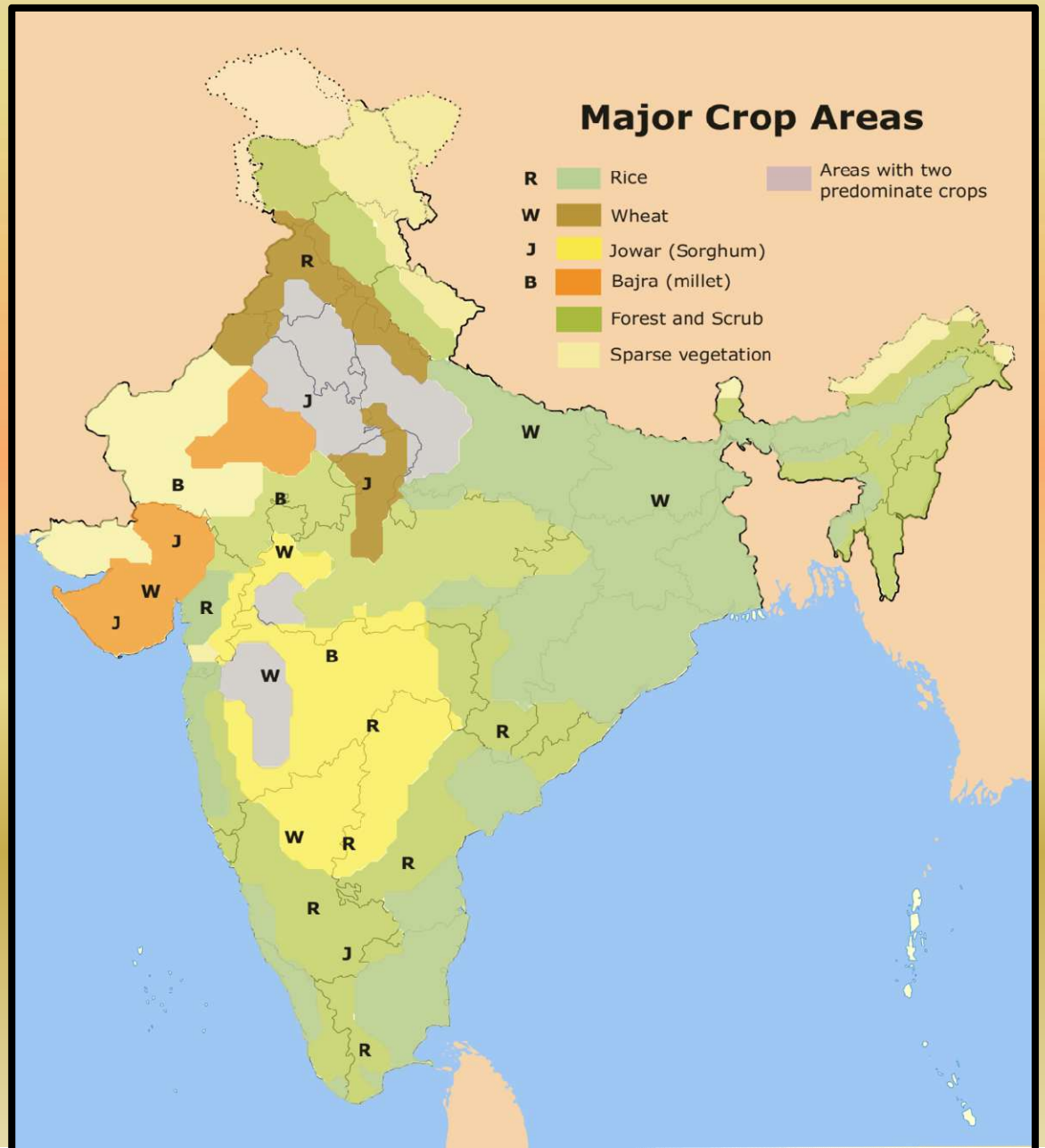
HISTORY

- Pre 1880 all grains were consumed “whole”
- 1880 – discovery of roller mill and flour refining process
- From 1900- White bread became the norm
- 1956- mandatory fortification of white flour with Vit B and Calcium
- 1980s – Oat bran hailed for health benefits
- 1990s- Rise in chronic disease, Diabetes, CVD, cancer leading to renewed interest & research in whole grains
- 2002 – Joint Health Claims Initiative approves claim for whole grains and heart health
- 2004 – JHCI health claim for oats and cholesterol approved
- 2009 – European Food Safety Authority approval for health claim for oats and cholesterol

GRAINS GROWN IN INDIA

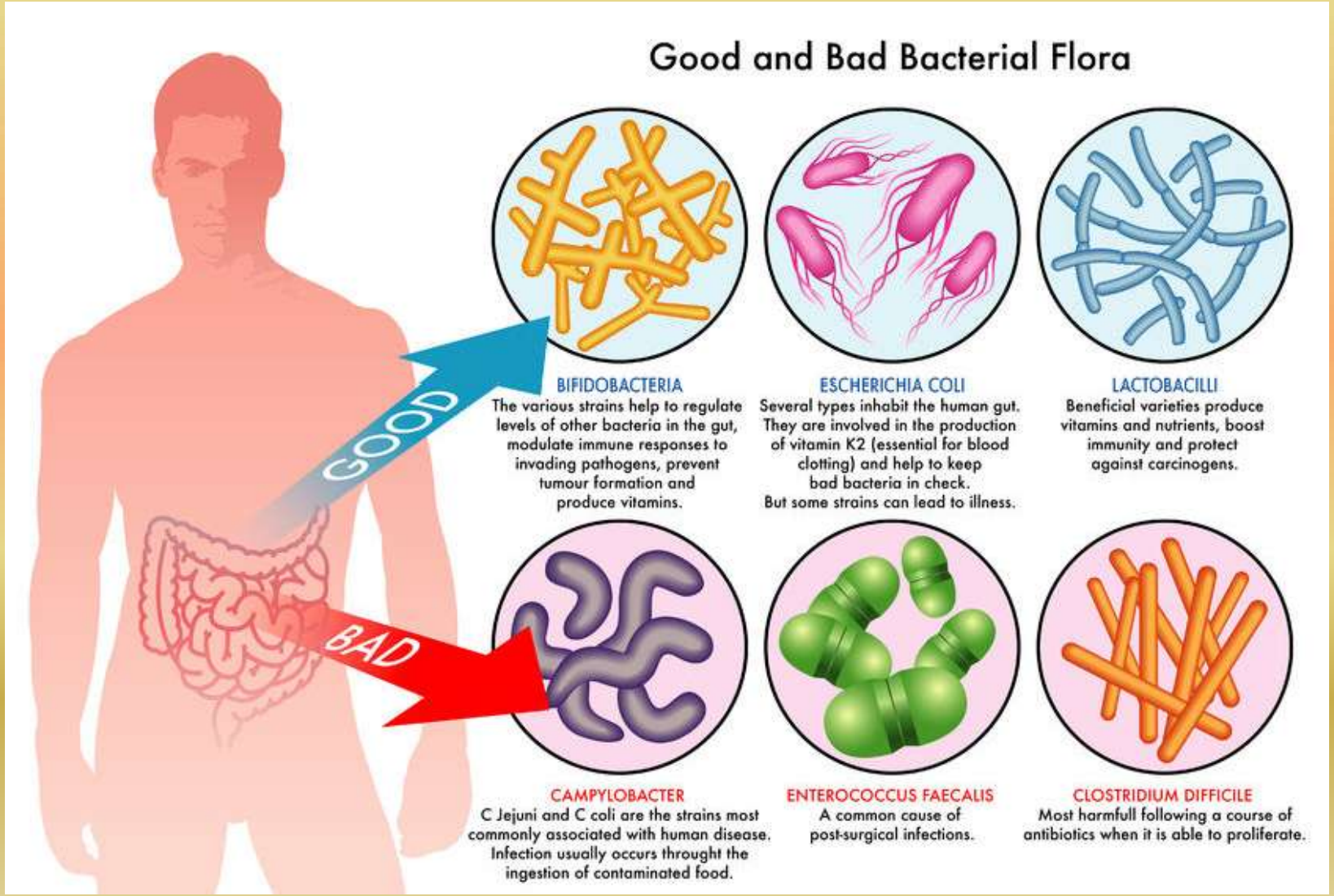


Exposing the myths

Myth : Whole grain consumption triggers inflammation

Fact : Whole grain reduces Inflammation and the incidence of chronic diseases

THE GOOD, THE BAD & THE FRIENDLY



gut microbes

Gut Microbes. 2013 Jul 1; 4(4): 340–346.
Published online 2013 Apr 15. doi: [10.4161/gmic.24707]
PMCID: PMC3744518
PMID: 23645316
in *ISME J*, volume 7 on page 269.

Abstract

Intake of whole grains and other food products high in dietary fiber have long been linked to the prevention of chronic diseases associated with inflammation. A contribution of the gastrointestinal microbiota to these effects has been suggested, but little is known on how whole grains interact with gut bacteria. We have recently published the first human trial that made use of next-generation sequencing to determine the effect of whole grains (whole grain barley, brown rice or a mixture of the two) on fecal microbiota structure and tested for associations between the gut microbiota and blood markers of inflammation, glucose and lipid metabolism.

Our study revealed that whole grains impacted gut microbial ecology by increasing microbial diversity and inducing compositional alterations, some of which are considered to have beneficial effects on the host. Interestingly, whole grains, and in particular the combination of whole grain barley and brown rice, caused a reduction in plasma interleukin-6 (IL-6), which was linked to compositional
features of the gut microbiota. Therefore, the study provided evidence that a short-term increased intake of whole grains led to compositional alterations of the gut microbiota that coincided with improvements in systemic inflammation.

In this addendum, we summarize the findings of the study and provide a perspective on the importance of regarding humans as holobionts when
considering the health effects of dietary strategies.

Exposing the myths

Myth : Grain causes spike in the blood sugar

Fact : Helps maintain blood glucose levels as they have low glycemic index due to its fibre and proteins

Myth : Eliminating wheat cures Diabetes / abnormal Glucose Tolerance

Fact : People eating whole grains are less likely to develop Type 2 DM
Atleast two servings of whole grains per day to reduce Type 2 DM risk

PubMed US National Library of Medicine National Institutes of Health
Eur J Epidemiol. 2013 Nov;28(11):845-58. doi: 10.1007/s10654-013-9852-5. Epub 2013 Oct 25.

Whole grain and refined grain consumption and the risk of type 2 diabetes: a systematic review and dose-response meta-analysis of cohort studies.

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Abstract

Several studies have suggested a protective effect of intake of whole grains, but not refined grains on type 2 diabetes risk, but the dose-response relationship between different types of grains and type 2 diabetes has not been established. We conducted a systematic review and meta-analysis of prospective studies of grain intake and type 2 diabetes. We searched the PubMed database for studies of grain intake and risk of type 2 diabetes, up to June 5th, 2013. Summary relative risks were calculated using a random effects model. Sixteen cohort studies were included in the analyses. The summary relative risk per 3 servings per day was 0.68 (95% CI 0.58-0.81, I(2) = 82%, n = 10) for whole grains and 0.95 (95% CI 0.88-1.04, I(2) = 53%, n = 6) for refined grains. A nonlinear association was observed for whole grains, p nonlinearity < 0.0001, but not for refined grains, p nonlinearity = 0.10. Inverse associations were observed for subtypes of whole grains including whole grain bread, whole grain cereals, wheat bran and brown rice, but these results were based on few studies, while white rice was associated with increased risk. Our meta-analysis suggests that a high whole grain intake, but not refined grains, is associated with reduced type 2 diabetes risk. However, a positive association with intake of white rice and inverse associations between several specific types of whole grains and type 2 diabetes warrant further investigations. Our results support public health recommendations to replace refined grains with whole grains and suggest that at least two servings of whole grains per day should be consumed to reduce type 2 diabetes risk.

Exposing the myths

Myth : Grains make you obese & overweight by causing increase in insulin levels and fat storage

Fact : Body fat is regulated by the brain and not the fat tissue itself or pancreas. Fat storage remains the same as far as the caloric intake and output is optimum.

The Evidence

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Review

Does wheat make us fat and sick?

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ABSTRACT

After earlier debates on the role of fat, high fructose corn syrup, and added sugar in the aetiology of obesity, it has recently been suggested that wheat consumption is involved. Suggestions have been made that wheat consumption has adverse effects on health by mechanisms related to addiction and overeating. We discuss these arguments and conclude that they cannot be substantiated. Moreover, we conclude that assigning the cause of obesity to one specific type of food or food component, rather than overconsumption and inactive lifestyle in general, is not correct. In fact, foods containing whole-wheat, which have been prepared in customary ways (such as baked or extruded), and eaten in recommended amounts, have been associated with significant reductions in risks for type 2 diabetes, heart disease, and a more favourable long term weight management. Nevertheless, individuals that have a genetic predisposition for developing celiac disease, or who are sensitive or allergic to wheat proteins, will benefit from avoiding wheat and other cereals that contain proteins related to gluten, including primitive wheat species (einkorn, emmer, spelt) and varieties, rye and barley. It is therefore important for these individuals that the food industry should develop a much wider spectrum of foods, based on crops that do not contain proteins related to gluten, such as teff, amaranth, oat, quinoa, and chia. Based on the available evidence, we conclude that whole-wheat consumption cannot be linked to increased prevalence of obesity in the general population.

1. Introduction

Wheat is the most widely cultivated cereal grain worldwide, being grown in temperate climates from Scandinavia in the north to Argentina in the south, including upland regions in the tropics. It is third among the cereals, behind maize and rice, in total global production, which was 704 million tons in 2011. The

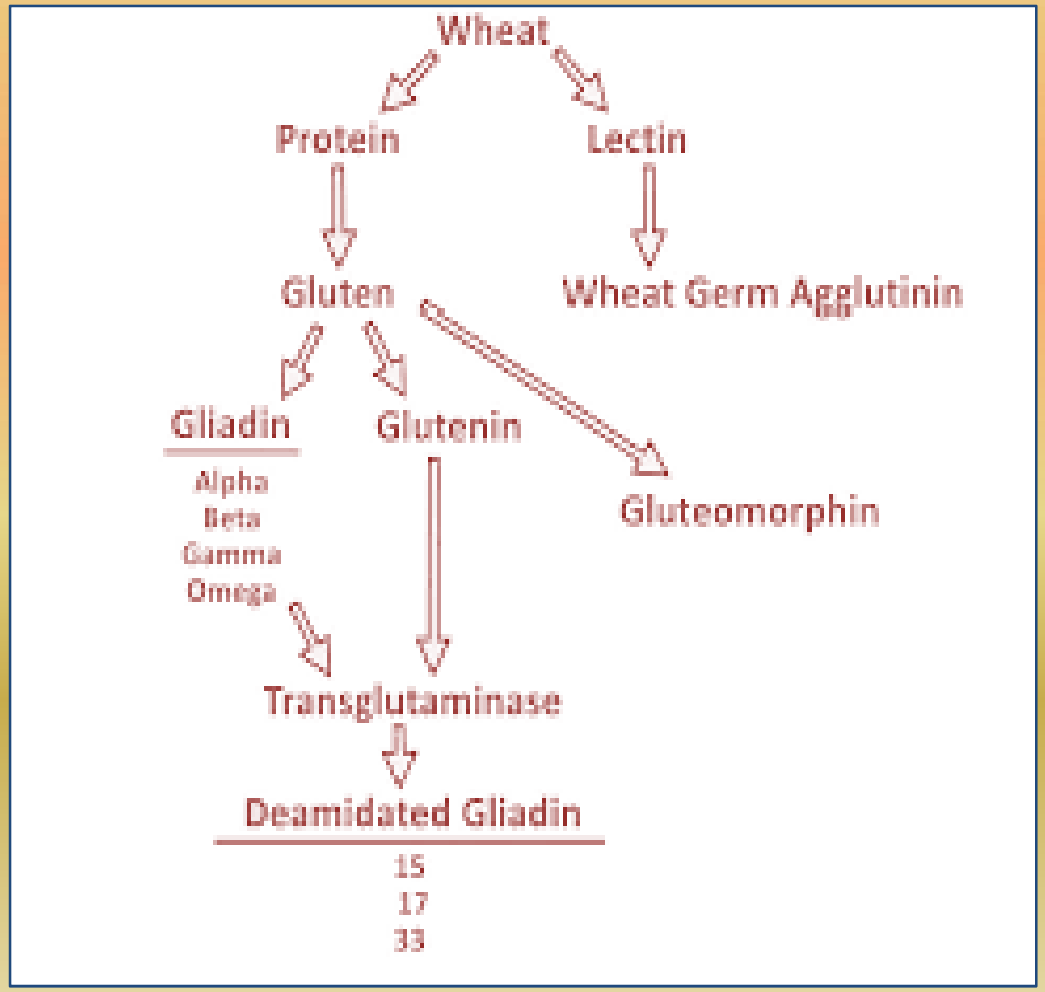
About 95% of the wheat that is grown and consumed globally is bread wheat (*Triticum aestivum*). Bread wheat is a relatively new species, having arisen in southeast Turkey about 9000 years ago (Feldman and Millet, 2001). It is hexaploid with three related genomes (termed A, B and D) and probably arose by spontaneous hybridization between a cultivated form of tetraploid wheat (*Triticum turgidum*) and a related wild grass species (goat grass, *Aegi-*

Exposing the myths

Myth : Wheat is addictive

Fact :Wheat proteins called gliadins, can stimulate opioid receptors, paving the way for addiction. However, these peptides are also found milk, rice and even spinach. Spinach addiction certainly isnt a problem!!


ADDICTION


Wheat
Protein
Lectin
Gluten
Wheat Germ Agglutinin
Gliadin
Glutenin
Alpha
Beta
Gamma
Omega
Gluteomorphin
Transglutaminase
Deamidated Gliadin
15
17
33

Exposing the myths

Myth:Gluten in the wheat is a concern for allergy and weight gain

Fact : Current evidence indicates that allergy to ingested wheat and coeliac disease (and related intolerances) each occur in up to 1% of the population. People who consume whole grains, many of which contain gluten, either lose weight or gain less weight over time, compared to people who consume little or no whole grains

Myth: Whole grains cause atherosclerotic CVD

Fact : whole grain intake is associated with a reduced risk of coronary heart disease and CVD

The Evidence

- *Research* ***Whole grain consumption and risk of cardiovascular disease, cancer, and all cause and cause specific mortality: systematic review and dose-response meta-analysis of prospective studies***
- *BMJ 2016; 353 doi: https://doi.org/10.1136/bmj.i2716 (Published 14 June 2016) Cite this as: BMJ 2016;353:i2716*

The Evidence

- Abstract Ref: BMJ. 2016 Jun 14;353:i2716. doi: 10.1136/bmj.i2716.
- **Objective** To quantify the dose-response relation between consumption of whole grain and specific types of grains and the risk of cardiovascular disease, total cancer, and all cause and cause specific mortality.
- **Study selection** Prospective studies reporting adjusted relative risk estimates for the association between intake of whole grains or specific types of grains and cardiovascular disease, total cancer, all cause or cause specific mortality.
- **Results** 45 studies (64 publications) were included. The summary relative risks per 90 g/day increase in whole grain intake (90 g is equivalent to three servings—for example, two slices of bread and one bowl of cereal or one and a half pieces of pita bread made from whole grains) was 0.81 (95% confidence interval 0.75 to 0.87; I^2=9%, n=7 studies) for coronary heart disease, 0.88 (0.75 to 1.03; I^2=56%, n=6) for stroke, and 0.78 (0.73 to 0.85; I^2=40%, n=10) for cardiovascular disease, with similar results when studies were stratified by whether the outcome was incidence or mortality. The relative risks for morality were 0.85 (0.80 to 0.91; I^2=37%, n=6) for total cancer, 0.83 (0.77 to 0.90; I^2=83%, n=11) for all causes, 0.78 (0.70 to 0.87; I^2=0%, n=4) for respiratory disease, 0.49 (0.23 to 1.05; I^2=85%, n=4) for diabetes, 0.74 (0.56 to 0.96; I^2=0%, n=3) for infectious diseases, 1.15 (0.66 to 2.02; I^2=79%, n=2) for diseases of the nervous system disease, and 0.78 (0.75 to 0.82; I^2=0%, n=5) for all non-cardiovascular, non-cancer causes. Reductions in risk were observed up to an intake of 210-225 g/day (seven to seven and a half servings per day) for most of the outcomes. Intakes of specific types of whole grains including whole grain bread, whole grain breakfast cereals, and added bran, as well as total bread and total breakfast cereals were also associated with reduced risks of cardiovascular disease and/or all cause mortality, but there was little evidence of an association with refined grains, white rice, total rice, or total grains.
- Conclusions This meta-analysis provides further evidence that whole grain intake is associated with a reduced risk of coronary heart disease, cardiovascular disease, and total cancer, and mortality from all causes, respiratory diseases, infectious diseases, diabetes, and all non-cardiovascular, non-cancer causes. These findings support dietary guidelines that recommend increased intake of whole grain to reduce the risk of chronic diseases and premature mortality.

Myth: Whole Phytic acid and phytates in grains are "Anti – Nutrients"

Fact : Soaking, germination, boiling, cooking, and fermentation all inactivate phytic acid and free up minerals for absorption Phytates have many health benefits

Exposing the myths

Dietary phytate has received much attention as an antinutrient, but more recent scientific studies support different beneficial properties of phytate in humans : Antioxidative effect, preventing pathological calcification, e.g. kidney stones and calcification in the heart vessels, cholesterol lowering effects and anticancer activity.

Myth: Lectins in whole grains can impair gut integrity

Fact : No substantial evidence shown to cite this as a reason to abstain from eating whole grains

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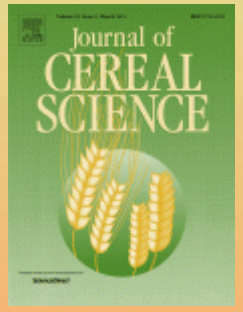
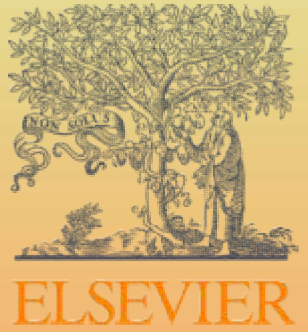
Review

Health effects of wheat lectins: A review





Vincent J.van Buul Fred J.P.H.Brouns
https://doi.org/10.1016/j.jcs.2014.01.010Get rights and content

Highlights

Lectins are carbohydrate-binding proteins present in most plants.

Raw cereal grains have relatively high concentrations of a variety of lectins.

Lectins in wheat germ are characterized as wheat germ agglutinin (WGA).

Isolated and excessive WGA intake is associated with negative health outcomes.

Adverse effects of WGA, as consumed in cooked or baked foods, are not observed.

Abstract

Lecitins are carbohydrate-binding proteins present in most plants.
They play a role in protecting plants against external pathogens, like fungi, and other organisms. Some common dietary staples, such as cereal grains and legumes, have relatively high concentrations of a variety of lectins. A part of the proteins present in wheat germ is characterized as wheat germ agglutinin (WGA), in this respect. Authors of popular nutritional plans propose adverse health effects of this wheat lectin.
With the use of different arguments, the consumption of foods high in lectins is discouraged. In this context, we discuss the effects of lectins f rom wheat on human health. Up-to-date research findings on mechanisms that wheat lectins have effects on health factors, such as obesity, autoimmune disease, and celiac disease, are critically reviewed. We conclude that there are many unsubstantiated assumptions made.
Current data about health effects of dietary lectins, as consumed in cooked, baked, or extruded foods do not support negative health effects in humans. In contrast, consumption of WGA containing foods, such as cereals and whole grain products, has been shown to be associated with significantly reduced risks of type 2 diabetes, cardiovascular disease, some types of cancer, as well as a more favourable long-term weight management. Research is recommended to define actual active lectin contents in wheat-based foods after heat preparation for human consumption.

Exposing the myths

- **Myth: Whole grains are high in calories**

- **Fact : Could help lose weight as they provide fibre, proteins, vitamins and minerals contributing to satiety**

WHOLE WHEAT/REFINED/ ENRICHED

Ref: The Whole Grains Council

Exposing the myths

Myth:Whole grains take longer to cook

Fact : Pre soaking the grains help in shortening the cooking time. Many whole grain products with shorter cooking are now available.

Myth: Whole grains are heavy to eat

Fact: Not so, tastier and wholesome too!!

A Final Note

- **Epidemiological studies consistently shows a positive role for whole grains – compelling**
- **Lack of data from large interventional trials to detect casual links**

Take Home Message

- Include whole grains in a meal/snack daily. Kickstart your day with a whole grain breakfast cereal!!
- Try to make half your grains whole.
- Whole grain is a bundle of nutrients, the advantages of which cannot be ignored.

Thank you