Whole grains and health benefits

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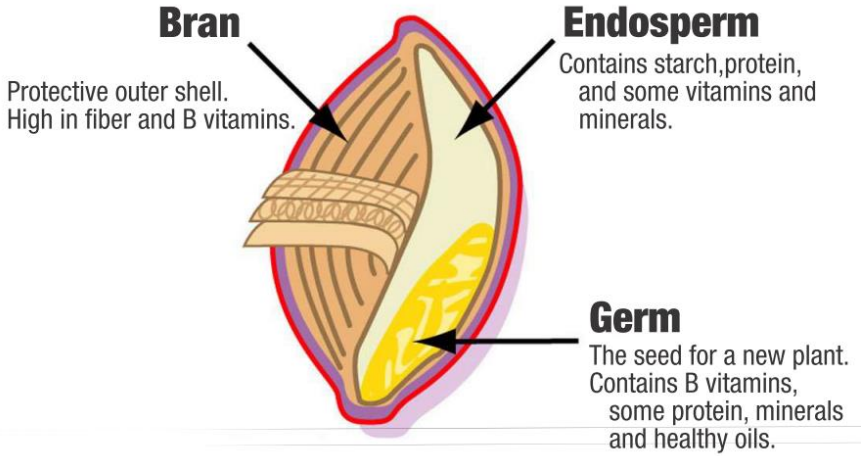
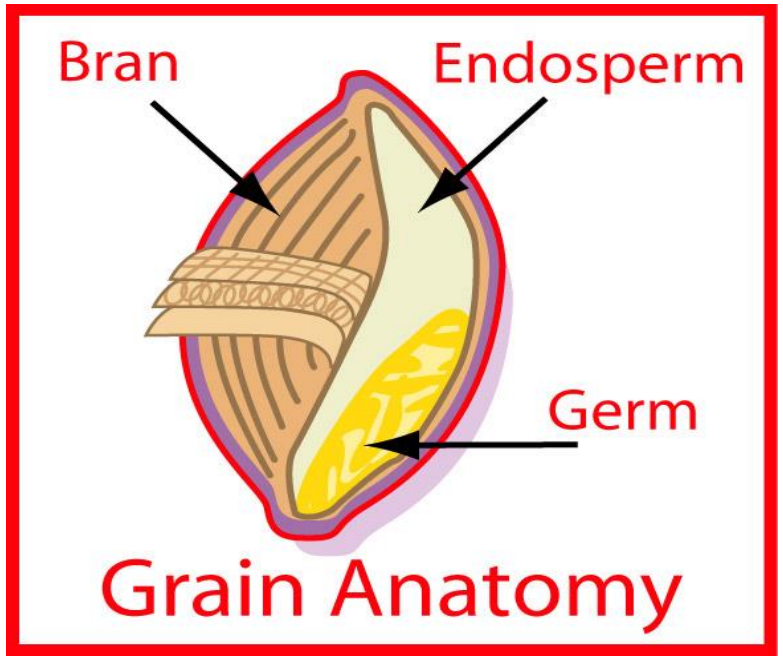
Defining Whole Grain

- Whole grain is the entire seed of a plant
  - Bran
    - Multi-layered outer layers of the kernel
    - High in antioxidants, B vitamins, and fibers
  - Germ
    - Embryo that can sprout into new plant
    - B vitamins, protein, minerals, and healthy fats
  - Endosperm
    - Plant's food supply
    - Starch, protein, and some vitamins and minerals



A Whole Grain Includes Everything



Whole grains or foods made from them contain all the essential parts and naturally-occurring nutrients of the entire grain seed.

If the grain has been processed (e.g., cracked, crushed, rolled, extruded, lightly pearled and/or cooked), the food product should deliver approximately the same rich balance of nutrients that are found in the original grain seed.

From: Whole Grains Council (2004)

Labeling terms and their definitions

Bran - means that the bran portion of the grain is a key component of the product and may not contain any of the germ portion. Products made with only bran (e.g., oat bran) are not whole grain because they don't contain all three parts of the grain kernel. Some products have bran added to whole grain flours to help boost the fiber content (e.g. Fiber One cereals).

Multigrain - This term is used to let you know that more than one grain is used in the product recipe. It doesn't mean all of them — or any of them — are whole grains!

100% Wheat — this label lets you know that wheat is the only grain used. It doesn't reveal whether or not the wheat is whole grain wheat.

Cracked Wheat - means the wheat grain kernel is broken into coarse, medium, or fine fragments before adding it to the product recipe. This doesn't mean that the product is made with whole grain wheat.

Organic - refers to the method of farming and processing foods. This is unrelated to whether or not a product is whole grain. You need other clues from the package to tell you that.

Pumpernickel - is a coarse dark bread made with a mix of rye and wheat flours. It may or may not be made with whole grain flours. Don't be fooled by the color, either — darker breads don't necessarily mean whole grain.

Stone Ground - refers to a technique for grinding grains. It usually means the grain is coarser and the germ is often intact, but the bran portion is generally not included. In other words, "stone ground" doesn't let you know if a whole grain was used.

Whole Wheat Nutrition Information

Nutrients	Whole (Hard) Wheat Flour[1]	Whole (Soft) Wheat Flour[2]	Refined Flour (Unenriched)[3]
Moisture (%)	10.3	10.4	11.9
Calories (Kcal)	339	340	364
Carbohydrate (%)	72.6	75.4	76.3
Dietary Fiber (%)	12.2	12.7	2.7
Protein (%)	13.7	10.7	10.3
Fat (%)	1.9	2	1
Ash/Minerals(%)	1.6	1.5	0.5

Nutritional data from the USDA National Nutrient Database

1 USDA Whole Grain Wheat Flour Data #20080

2 USDA Whole Grain Wheat Flour Data #20075

3 USDA Refined Unenriched Wheat Flour Data #20081

Whole Wheat Nutrition Information

Vitamins	Whole (Hard) Wheat Flour[1]	Whole (Soft) Wheat Flour[2]	Refined Flour (Unenriched)[3]
Niacin (mg/100g)	6.4	4.8	1.3
Vitamin E (mg ATE/100g)	1.2	1.0	0.1
Pantothenic Acid (mg/100g)	1.0	0.9	0.4
Thiamin (mg/100g)	0.5	0.4	0.1
Vitamin B6 (mg/100g)	0.3	0.4	0
Riboflavin (mg/100g)	0.2	0.1	0
Folate (mcg/100g)	44	41	26

Nutritional data from the USDA National Nutrient Database

1 USDA Whole Grain Wheat Flour Data #20080

2 USDA Whole Grain Wheat Flour Data #20075

3 USDA Refined Unenriched Wheat Flour Data #20081

Whole Wheat Nutrition Information

Minerals	Whole (Hard) Wheat Flour[1]	Whole (Soft) Wheat Flour[2]	Refined Flour (Unenriched)[3]
Potassium (mg/100g)	405	435	107
Phosphorus (mg/100g)	346	402	108
Magnesium (mg/100g)	138	90	22
Calcium (mg/100g)	34	34	15
Iron (mg/100g)	3.9	5.4	1.8
Manganese (mg/100g)	3.8	3.4	0.7
Zinc (mg/100g)	2.9	3.5	0.7
Copper (mg/100g)	0.4	0.4	0.1
Selenium (mg/100g)	70.7	Not Available	33.9

Nutritional data from the USDA National Nutrient Database

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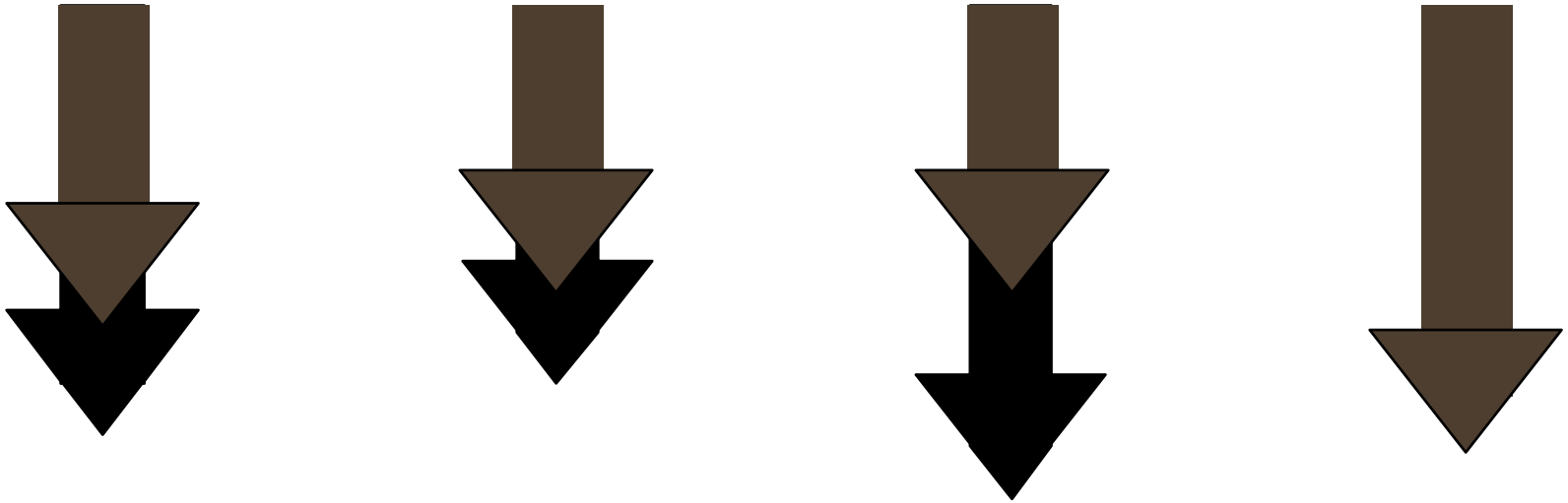
Health Benefits

risk of heart disease drops 25-36%

risk of type 2 Diabetes drops 21-27%

risk of digestive cancers drops 21-43%

risk of stroke drops 37%



Whole Grains Council and Oldways: Summary of Recent Research On Whole Grains and Health. www.wholegrainscouncil.org

Health Benefits of Whole Grains

- **Stops Heart Disease**. Men who ate a bowl of whole-grain cereal every day cut their risk of dying of cardiovascular disease by 20%
- **Reduces Blood Pressure**. Eating a whole-grain oat cereal, such as oatmeal, every day for three months enabled 73% of those with high blood pressure to reduce or eliminate their need for medication
- **Saves Lives**. Older women who ate whole grains containing 4.7g of fiber daily were 17% less like to die of any cause in an 11-year period than were women who ate refined grains

Other Health Benefits of Whole Grains

- Reduced risk of asthma
- Healthier carotid arteries
- Reduction of inflammatory disease risk
- Lower risk of diabetes
- Less gum disease and tooth loss
- Reduces triglycerides

Whole Grains Council and Oldways: Summary of Recent Research On Whole Grains and Health. www.wholegrainscouncil.org

Characterization of Whole Grain Products by AACC International

- On May 21, 2013, AACC International's (AACCI) Board of Directors approved the Whole Grains Working Group's characterization of whole grain products. The characterization asserts that a whole grain food product must contain 8 grams or more of whole grain per 30 grams of product.

Existing Standards for Whole Grains

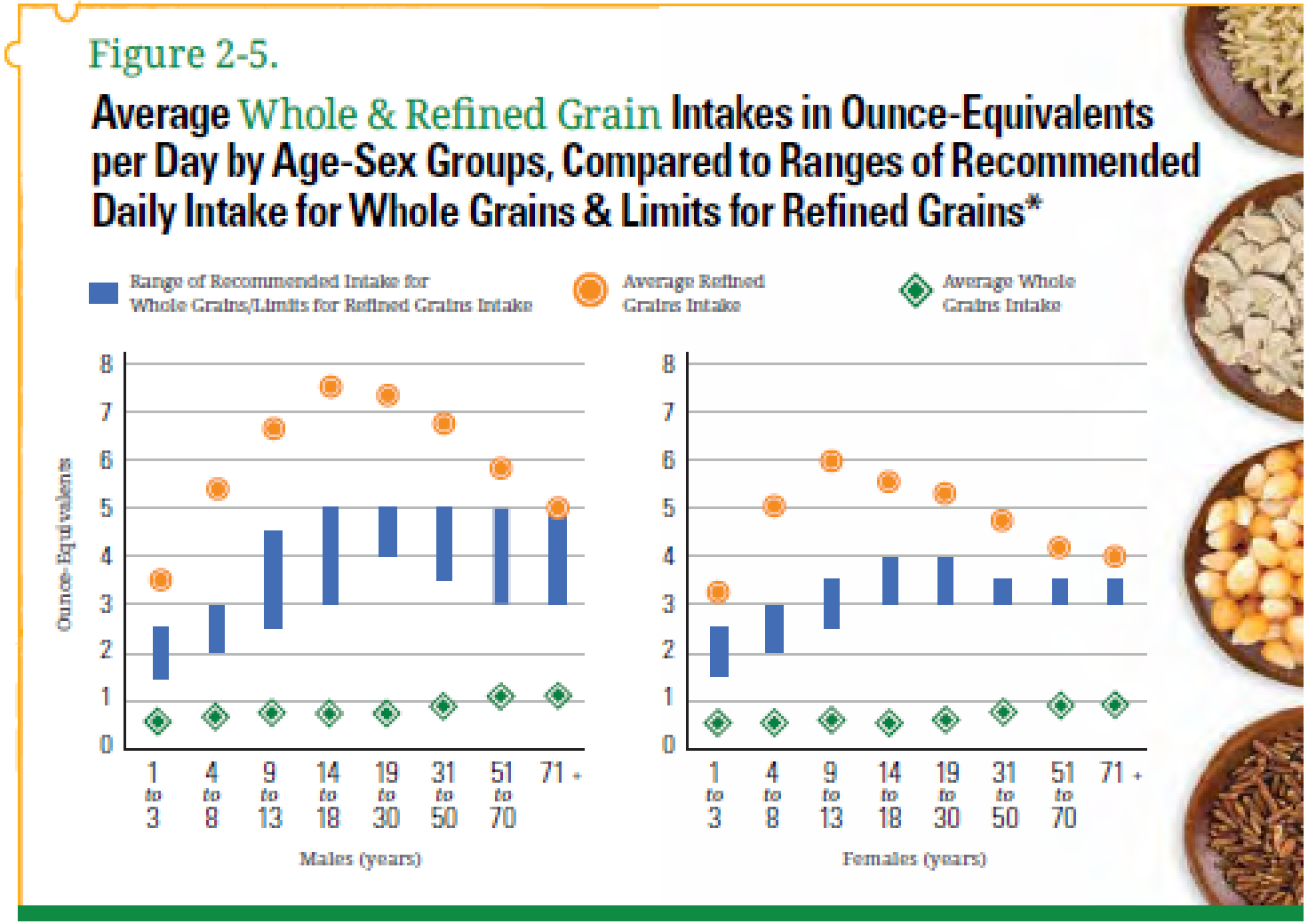
Where + When	Who + What	What qualifies as whole grain	Other restrictions
International 2005	Whole Grains Council Basic Stamp	At least 8 g WG per serving	none
International 2005	Whole Grains Council 100% Stamp	At least 8 g WG per serving All the grain is whole grain	None
USA 1999 / 2003	FDA Whole Grain Health Claim	At least 51% of the total weight must be WG	Limits on fats and cholesterol
USA 2005	USDA / FSIS Interim Policy Guidance	At least 8 g WG per serving At least 51% of the grain is WG	none

The Whole Grain Stamp

Basic Stamp
at least 8g (1/2 serving) of WG

100% Stamp
NO refined grain AND
at least 16g (1 serving) of WG

Recommended Whole Grain Consumption



Source: 2015 Dietary Guidelines for American

How to Make at Least Half of Total Grains Whole Grains

FIGURE 4-1. Three Ways to Make at Least Half of Total Grains Whole Grains[a]

1. 3 ounces of 100% whole grains and 3 ounces of refined-grain products

2. 2 ounces of 100% whole grains, 2 ounces of partly whole-grain products,[b] and 2 ounces of refined-grain products

3. 6 ounces of partly whole-grain products

Research

LWT - Food Science and Technology 126 (2020) 109294

Contents lists available at ScienceDirect

LWT - Food Science and Technology

journal homepage: www.elsevier.com/locate/lwt

Evaluation of aleurone flour on dough, textural, and nutritional properties of instant fried noodles

Min Xu[a,b,c], Gary G. Hou[a,d,*], Fengyun Ma[e], Junzhou Ding[f], Lingzhu Deng[a], Ozan Kahraman[f], Meng Niu[g], Kathleen Trivettea[a,h], Bon Lee[a], Liang Wu[i], Byung-Kee Baik[e]

- Aleurone can be incorporated at up to 10 – 15% (fwb) in instant fried noodles to improve their nutritional quality
  - *Noodle color and cooking yield were most acceptable through ~10% aleurone*
  - *Noodle textural properties were maintained through ~15% aleurone*
  - *Excellent source of fiber claim possible at 12% aleurone*

Research

LWT - Food Science and Technology 57 (2014) 58–64

Contents lists available at ScienceDirect

LWT - Food Science and Technology

journal homepage: www.elsevier.com/locate/lwt

Effects of fine grinding of millfeeds on the quality attributes of reconstituted whole-wheat flour and its raw noodle products

Meng Niu [a,b], Gary Hou [b,*], Bon Lee [b], Zhengxing Chen [a,c,**]

- Fine grinding of bran improves whole wheat noodle quality
  - *Finer particle size distributions increase*
    - Farinograph stability time
    - Noodle dough L* values (24 h)
    - Noodle cooking yield
    - Noodle firmness, springiness, cohesiveness, and resilience

Research

Food Chemistry 223 (2017) 16–24

Contents lists available at ScienceDirect

Food Chemistry

journal homepage: www.elsevier.com/locate/foodchem

Microstructural, textural, and sensory properties of whole-wheat noodle modified by enzymes and emulsifiers

Meng Niu [a,b], Gary G. Hou [b,*], Julie Kindelspire [c], Padmanaban Krishnan [c], Siming Zhao [a]

- Whole wheat noodle gluten and textural properties can be improved with transglutaminase and SSL
  - *Both improve the interactions between proteins and starch in dough*
  - *Transglutaminase improves noodle firmness, springiness, and resilience*
  - *SSL improves cohesiveness*
  - *Glucose oxidase, endoxylanase, and soy lecithin were less effective*

WHEAT MARKETING CENTER

Questions?

THANK YOU FOR YOUR VISIT

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