

# What Is Gluten?

Justine Jossic  
Undergraduate Student -  
Nutrition/Food Science

Aubree Hawley  
Ph.D. Student - Nutrition/  
Food Science

Jamie I. Baum,  
Associate Professor -  
Food Science

## What Is Gluten?

Gluten is a protein found in grains such as wheat, rye, barley, some oats (via contamination during processing) and foods made from these grains (e.g., breads, pastas, pastries, crackers, granola and cereals). It is also found in a variety of processed foods such as soy sauce, lunch meats and energy/granola bars [1]. Gluten is derived from the Latin word “glue” in that it acts as the “glue of food” by helping foods stick together to keep their shape. This protein also helps bread rise and contributes to its chewiness [2].

## Gluten as Part of a Healthy Diet

Gluten-containing foods can have beneficial properties [3]. Whole grains that contain gluten can also provide a good source of fiber, vitamins and minerals for gut health [4].

## Can Gluten Be Harmful?

For most people, gluten is safe to consume, but others may experience negative effects. The popular press has labeled gluten as an unhealthy protein, but this is not always the case. Gluten only negatively affects those with gluten-related health conditions. The three most prevalent gluten-related health conditions include gluten sensitivity, wheat allergies and celiac disease.

### Non-celiac gluten sensitivity:

Individuals with a non-celiac gluten sensitivity may have a negative

response to gluten-containing products but do not experience intestinal damage or allergic reactions to gluten directly [5].

**Wheat allergy:** Wheat allergies are characterized by a reaction to wheat proteins, including but not limited to gluten, and are frequently developed during early infancy or toddlerhood [6]. People with wheat allergies must avoid foods containing wheat, even in very small amounts, to prevent allergic reactions.

**Celiac disease:** Celiac disease is an autoimmune disorder that affects less than 1 percent of the population [3]. The small intestine produces an immune response to gluten which damages the lining and results in decreased nutrient absorption [6]. People with celiac disease must avoid gluten, even in miniscule amounts, to prevent intestinal damage.

## Is a Gluten-Free Diet Beneficial?

People with gluten-related conditions must avoid gluten, but many people think it is beneficial for a healthy person to be on a gluten-free diet. Approximately 30 percent of Americans have reported trying a gluten-free diet [4]. It is important to evaluate the true health benefits of a gluten-free diet, because gluten-free foods cost approximately 200 percent more than equivalent gluten-containing products [3].

Healthy people who avoid gluten may experience weight loss

*Arkansas Is  
Our Campus*

Visit our web site at:  
<https://www.uaex.uada.edu>

and increased good cholesterol (HDL cholesterol) [4]. However, it is important to note that these benefits are likely due to the avoidance of baked and fried foods which lowers fat and calorie intake. For example, gluten-free diets commonly include fruits and vegetables, while excluding highly processed, high calorie, high fat foods such as refined carbohydrates (e.g., pastries, cakes and pizza). Research has shown that gluten-free products are not healthier than their gluten-containing counterparts [3]. In a study with 47 men and women following a gluten-free diet, men and women did not meet the recommended intake of calcium or fiber [8]. Overall, adults following a gluten-free diet do not consume enough nutrient-rich foods to meet all nutritional recommendations [8].

If you are interested in improving the healthfulness of your diet, the table at right lists good (or healthy) gluten-containing and gluten-free options to add to your diet.

On August 2, 2013, the FDA issued a final rule defining “gluten-free” for food labeling, which will help consumers, especially those living with celiac disease, be confident that items labeled “gluten-free” meet a defined standard for gluten content. As of August 5, 2014, foods with a “gluten-free” claim on the label must comply with the requirement that the food is inherently gluten-free or **does not** contain an ingredient that is:

- a gluten-containing grain;

## Healthy Gluten and Gluten-Free Food Options [9]

Gluten-Free Foods	Foods Containing Gluten
Fruits	Whole grain pasta
Vegetables	Whole grain breads
Eggs	Whole grain breakfast cereals
Fish	Protein/granola bars
Poultry	Low-sodium lunch meats
Whole Grains	Soups
– Quinoa	Low-sodium soy sauce
– Brown/black/red rice	Dairy products as an additive or thickener
– Corn	– Flavored Greek yogurts
– Sorghum	– Chocolate milk
Beans	
Nuts	Most sauces and dressings
Potatoes	

- derived from a gluten-containing grain that has not been processed to remove gluten (e.g., wheat flour); or
- derived from a gluten-containing grain that has been processed to remove gluten (e.g., wheat starch), if the use of that ingredient results in the presence of 20 parts per million (ppm) or more gluten in the food.

Also, any unavoidable presence of gluten in the food must be less than 20 ppm.

## References

1. Hatfield, H. (2014). Hidden Sources of Gluten. <https://www.webmd.com/diet/features/hidden-sources-of-gluten#1>
2. Celiac Disease Foundation. What Is Gluten? <https://celiac.org/live-gluten-free/glutenfreetdiet/what-is-gluten/>
3. Niland, Benjamin, and Brooks D. Cash. Health benefits and adverse effects of a gluten-free diet in non-celiac disease patients. *Gastroenterology and Hepatology*. 2018:14(2).
4. Kim, H. S., M. F. Demyen, J. Mathew, N. Kothari, M. Feurdean and S. K. Ahlawat. Obesity, metabolic syndrome and cardiovascular risk in gluten-free followers without celiac disease in the United States: results from the National Health and Nutrition Examination Survey 2009-2014. *Dig Dis Sci*. 2017:62(9):2440-2448.
5. Chan, T. H. Gluten: A Benefit or Harm to the Body. Harvard University.
6. Aziz, I., F. Branchi and D. S. Sanders. The rise and fall of gluten! *Proc Nutr Soc*. 2015:74(3):221-226.
7. Thompson, T., M. Dennis, L. A. Higgins, A. R. Lee and M. K. Sharrett. Gluten-free diet survey: are Americans with coeliac disease consuming recommended amounts of fibre, iron, calcium and grain foods? *Journal of Human Nutrition Dietetics*. 2005:18:163-169.
8. Missbach, B., L. Schwingshackl, A. Billmann, A. Mystek, M. Hickelsberger, G. Bauer and J. Konig. Gluten-free food database: the nutritional quality and cost of packaged gluten-free foods. *PeerJ*. 2015:3:e1337.
9. Celiac Disease Foundation. What Can I Eat? <https://celiac.org/live-gluten-free/glutenfreetdiet/what-is-gluten/>

Printed by University of Arkansas Cooperative Extension Service Printing Services.

JUSTINE JOSSIC is an undergraduate student - nutrition/food science at La Salle University, Rouen, France. AUBREE HAWLEY is a Ph.D. student - nutrition/food science at the Department of Food Science, University of Arkansas System Division of Agriculture in Fayetteville. DR. JAMIE I. BAUM is associate professor - nutrition with the Department of Food Science, University of Arkansas System Division of Agriculture in Fayetteville.

FSFCS101-PD-1-2019N

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director, Cooperative Extension Service, University of Arkansas. The University of Arkansas System Division of Agriculture offers all its Extension and Research programs and services without regard to race, color, sex, gender identity, sexual orientation, national origin, religion, age, disability, marital or veteran status, genetic information, or any other legally protected status, and is an Affirmative Action/Equal Opportunity Employer.