

**Product Alert from Gluten Free Watchdog  
Boulder Canyon Malt Vinegar Chips  
Tricia Thompson, MS, RD**

**Bottom Line:** At least two (maybe three) varieties of Boulder Canyon malt vinegar and sea salt chips are labeled gluten-free and/or erroneously contain the Gluten Free Certification Organization (GFCO) Certified Gluten-Free mark (i.e. they were never certified by GFCO) and include the ingredients malt vinegar and malt extract. The products are Boulder Canyon Malt Vinegar & Sea Salt Chips and Boulder Canyon Malt Vinegar and Sea Salt Wavy Potato Chips, Kettle Cooked in 100% Avocado Oil. There also are questions regarding the Malt Vinegar & Sea Salt chips in compostable packaging.

Ingredients: Potatoes, Sunflower and/or safflower oil, Malt vinegar powder (maltodextrin, food starch modified, malt vinegar), Fructose, White vinegar powder (maltodextrin, distilled white vinegar), Sea salt, Citric acid, Malt extract

Ingredients: Potatoes, Avocado oil, Malt vinegar powder (maltodextrin, modified food starch, malt vinegar), White vinegar powder (maltodextrin, distilled white vinegar), Sea salt, Fructose, Citric acid, Malt extract.

*It has become very clear over the past four weeks that Boulder Canyon has no intention of removing current product from store shelves. It is astounding to me that pullback notices were issued by GFCO almost four weeks ago. It is not clear from GFCO what a pullback notice means but it sounds like product should be removed from store shelves. It is also dumbfounding that a manufacturer with gluten-free certification on some products would be unaware that malt extract should not be included in products labeled gluten-free. But this is not the first time this has happened. It is clear that manufacturers, including those who have certification programs in place, need more education on what it means to manufacture a gluten-free product under the rules of the Food and Drug Administration (FDA).*

**Just to be clear the FDA recently confirmed with me via email that malt extract can NOT be included in foods labeled gluten-free.** While manufacturers have until August 2014 to bring labels into compliance the FDA also states that, “manufacturers are responsible for ensuring that their product labels are truthful and not misleading.”

**Boulder Canyon Timeline**

January 21, 2014: Notified via Gluten Free Watchdog’s Facebook page that a Boulder Canyon chip—Malt Vinegar & Sea Salt—was labeled gluten-free and contained the GFCO Certified Gluten-Free mark. This product contains both malt vinegar and malt extract.

January 22, 2014: Contacted the manufacturer by phone three times. I asked but was not put through to a quality control representative.

January 22, 2014: Had the following email exchange with Boulder Canyon:

Hi, I run the food testing service Gluten Free Watchdog [www.glutenfreewatchdog.org](http://www.glutenfreewatchdog.org). I was advised yesterday that your malt vinegar chips are advertised as gluten-free on the product page of your website. I am assuming this is a mistake as they contain malt vinegar and malt extract. Barley is also listed as an allergen. Please advise and let me know when this information will be corrected on your site. Thank you.

Thank you for contacting Boulder Canyon Natural Foods! We recently made a change to our Malt Vinegar & Sea Salt chips so that they are now gluten free. The vinegar distillation process removes the gluten proteins from the barley so the Malt Vinegar is gluten free. The product has been tested and certified gluten free by the Gluten Free Certification Organization. If you have any other questions, please feel free to contact us again.

January 22: Asked Boulder Canyon via Twitter to please check their product page for their Malt Vinegar & Sea Salt Chips as this product contains malt vinegar and malt extract and is categorized as gluten-free (I thought it was in error).

January 22: Boulder Canyon replies that the product is gluten-free and meets gluten-free approval for FDA and GFCO.

January 22: GFCO gets involved in the discussion.

January 23: GFCO issues a pull-back notice for Boulder Canyon Malt Vinegar & Sea Salt Chips. This particular flavor was not certified by GFCO.

January 23: Boulder Canyon is notified of another chip containing malt vinegar and malt extract that contains the GFCO certification mark.

January 24: GFCO issues a pull-back notice for the second chip--Boulder Canyon Malt Vinegar and Sea Salt , Wavy Potato Chips, Kettle Cooked in 100% Avocado Oil.

February 10: A subscriber to Gluten-Free Watchdog notifies me that both varieties of Boulder Canyon chips are still on store shelves at a Kroger in Ohio in original packaging.

February 10: Boulder Canyon is asked via Twitter why this is the case. They respond, "New packaging has no GFCO logo; are working to sticker existing; we appreciate patience while we rectify."

February 10: A subscriber to GFW sends me packages of both chips.

February 14: Boulder Canyon is asked via Twitter if their malt vinegar chips in compostable packaging also carry GFCO mark. No reply is received.

February 14: FDA is sent an email regarding the slow response of this manufacturer to remove product from store shelves.

February 14: FDA requests and is sent pictures of product Boulder Canyon product labels.

February 14: Boulder Canyon releases a statement on their website (paraphrasing):

1. New packaging will contain neither the GFCO logo nor the gluten-free claim. The GFCO logo on current packaging at manufacturer plant and distribution center has been stickered over. There is no mention regarding the gluten-free claim on one variety of malt vinegar chips and whether this too has been stickered over.
2. Boulder Canyon states products, "have undergone proper third-party testing methodology as directed by The GFCO to confirm compliance with the 10 ppm (or less) standards." The testing methodology is not mentioned.
3. Boulder Canyon infers that malt extract and malt vinegar may be ingredients processed to remove gluten.

February 15: Both varieties of chips are sent to Bia Diagnostics for testing.

February 16: Notified via Twitter and Facebook that there are new displays of Boulder Canyon malt vinegar chips at Kroger stores and the GFCO logo has not been stickered.

February 16: Kroger tweets that Boulder Canyon chips are allowed to be labeled gluten-free per FDA guidelines.

### **Questions & Answers**

Hopefully your most pressing questions are answered below. If not please contact me through the contact page at [www.glutenfreewatchdog.org](http://www.glutenfreewatchdog.org).

### **What is malt extract?**

Under the FDA's Code of Federal Regulations, malt extract is defined as, "the product of barley (*Hordeum vulgare* L.) germinated under controlled conditions. Malt syrup and malt extract are interchangeable terms for a viscous concentrate of water extract of germinated barley grain, with or without added safe preservative. Malt syrup is usually a brown, sweet, and viscous liquid containing varying amounts of amylolytic enzymes and plant constituents. Barley is first softened after cleaning by steeping operations and then allowed to germinate

under controlled conditions. The germinated grain then undergoes processing, such as drying, grinding, extracting, filtering, and evaporating, to produce malt syrup (malt extract) with 75 to 80 percent solids or dried malt syrup with higher solids content.”

### **What is malt vinegar?**

According to the FDA’s Compliance Policy Guide malt vinegar is “the product made by the alcoholic and subsequent acetous fermentations, without distillation, of an infusion of barley malt or cereals whose starch has been converted by malt.”

### **Isn’t it true that the only criterion for a food to be labeled gluten-free is that it tests below 20 parts per million of gluten?**

No, but this is a common misunderstanding. To be labeled gluten-free a product regulated by the FDA must meet **all** of the following:

Is inherently gluten-free (e.g., raw carrots)

### **OR**

Adheres to the following criteria:

- Does not contain an ingredient that is a gluten-containing grain (e.g., wheat)
- Does not contain an ingredient derived from a gluten-containing grain that has not been processed to remove gluten (e.g., wheat flour)
- May contain an ingredient derived from a gluten-containing grain that has been processed to remove gluten (e.g., wheat starch) as long as use of that ingredient in the food does NOT cause the food to contain 20 ppm or more gluten

### **AND**

Any unavoidable presence of gluten in the food is less than 20 ppm gluten.

*In other words, there are certain ingredients that are NOT allowed in foods labeled gluten-free **regardless of the amount of gluten the final food product contains.***

*The FDA says the following in its online document “Questions and Answers: Gluten-Free Food Labeling Final Rule:*

### **“Can a food be labeled gluten-free if it is made with small amounts of a gluten-containing grain or ingredients derived from such grains that were not processed to remove gluten, if the food contains less than 20 ppm gluten?”**

No. A food labeled gluten-free cannot be intentionally made with any amount of a gluten-containing grain (wheat, rye, barley, or their crossbred hybrids like triticale) or an ingredient derived from such grain that was not processed to remove gluten.

The goal of manufacturing any food labeled gluten-free should be for the food to not contain any gluten or to contain the lowest amount possible that is less than 20 ppm gluten. **One goal of FDA’s regulatory definition of the term “gluten-free” is to limit consumer confusion when reading ingredient lists of foods labeled gluten-free.”**

**Does the FDA allow foods labeled gluten-free to contain malt extract?**

No. The FDA recently confirmed with me via email that they currently consider malt extract to be an ingredient NOT processed to remove gluten.

**Is malt extract a hydrolyzed ingredient?**

Malt extract is a *naturally* hydrolyzed ingredient. This means that the protein is hydrolyzed (broken apart) by enzymes that are naturally present in barley seed. Protein is not *intentionally* hydrolyzed through the addition of enzymes or acid.

**How should the gluten content of malt extract be assessed?**

Because malt extract is a naturally hydrolyzed ingredient it should be assessed for gluten using both the sandwich and competitive R5 ELISAs. Testing with just the sandwich R5 ELISA is not appropriate. *Again, regardless of test results products containing malt extract can NOT be labeled gluten-free.*

**Why shouldn’t the sandwich R5 ELISA be the only assay used to assess foods containing hydrolyzed ingredients?**

The simple explanation courtesy of Al Klapperich: “chopped up stuff is hard to detect.”

And my long-winded explanation (please feel free to skip!): A sandwich ELISA is used to assess the gluten content of foods when the gluten protein is intact or relatively intact. With this type of assay, two epitopes or antibody binding sites are needed. When an ingredient is hydrolyzed the gluten protein is broken into smaller protein fragments. These peptides may no longer contain two epitopes. As a result gluten content may be underestimated if the food is assessed using a sandwich ELISA.

For example consider the following protein where “QQPFP” represents the epitope and “a” represents other amino acids:

aaaaa**QQPFP**aaaaaaaaaaaaaaaa**QQPFP**aaa**QQPFP**aaaaaa**QQPFP**

If this protein undergoes hydrolysis, the following three fragments may result:

1. aaaaa**QQPFP**
2. aaaaaaaaaaaaaaaaa**QQPFP**aaa**QQPFP**
3. aaaaa**QQPFP**

The sandwich R5 ELISA (which utilizes the R5 monoclonal antibody to the epitope QQPFP) would be unable to measure the first or the third protein

fragments because these peptides contain only one QQPFP epitope. Only the second protein fragment would be measured by the sandwich R5 ELISA. When only one epitope or antibody binding site is available (which may be the case when ingredients are hydrolyzed) a competitive ELISA (e.g., competitive R5 ELISA) should be used.

### **Aren't there issues with the competitive R5 ELISA?**

Yes. *Potential* issues include the lack of what some scientists term “proper” standards or reference materials that allow for the results to be interpreted, the extraction solution (ethanol) which may not be ideal for extracting proteins from foods that have been heated and denatured, and the fact that the R5 epitope is simply a marker protein—it may be the case that the R5 epitope occurs in a fragment that is not toxic while it does not occur in a fragment that is toxic.

In addition the FDA writes in its online document, Questions and Answers: Gluten-Free Food Labeling Final Rule, “As discussed in the final rule, FDA is aware that sandwich ELISA methods do not adequately detect gluten in fermented and hydrolyzed foods. Because scientifically valid methods currently are lacking that can do so, we intend to issue a proposed rule on this issue.”

### **Reporting food to the FDA that may be misbranded**

You can report any complaint you have about an FDA-regulated food, including potential misuse of gluten-free claims on food labels to an FDA Consumer Complaint Coordinator in the state where the food was purchased. Please see <http://www.fda.gov/Safety/ReportaProblem/ConsumerComplaintCoordinators/default.htm> for a listing of Consumer Complaint Coordinators.

### **Gluten Free Watchdog Test Results**

This is where the issue with these chips is going to get very confusing...

Both varieties of chips were tested multiple times using the sandwich and competitive R5 ELISAs and they tested below the lower limit of quantification (5 parts per million for the sandwich and 10 parts per million for the competitive).

There are several possible explanations for the test results, all of which could apply in this case:

1. There are low levels of peptides containing the R5 epitope in the malt vinegar and malt extract used in these particular products
2. Malt extract and malt vinegar are minor ingredients in these products
3. It is difficult to assess gluten content from fermented foods (malt vinegar) and hydrolyzed ingredients (malt extract)
4. The sandwich R5 ELISA does not work very well when assessing the gluten content of hydrolyzed/fermented ingredients and issues remain (at least in the minds of some scientists and the FDA) regarding the robustness of the competitive R5 ELISA

### **Important points**

The test results on these two bags of chips do not mean that Boulder Canyon can label their malt vinegar chips gluten-free. Again, there are certain ingredients that are not allowed under the FDA's gluten-free labeling rule regardless of test results—malt extract is one of them at this time.

These results also do not mean that people with celiac disease can eat products containing malt, malt extract, and malt syrup. The gluten content of these ingredients varies and some malt extracts contain large amounts of gluten peptide fragments. A sandwich ELISA (which most manufacturers use if they test products) is not adequate for testing foods and ingredients that are fermented/hydrolyzed.

One point of confusion is that the Coeliac UK does allow malt extract in some foods labeled gluten-free depending upon the gluten content of the final food product. It is not clear whether products are required to be tested using the competitive R5 ELISA.

From the Coeliac UK website:

Can I eat breakfast cereals with barley malt extract in them?

Foods that contain barley malt extract in smaller amounts can be eaten by most people with coeliac disease but these products have to be labeled as containing barley.

### **Final thoughts...**

In my opinion, because of all the unknowns that remain regarding testing, it is best to err on the side of caution when it comes to the ingredients malt, malt extract, and malt syrup.

*Thank you to Amy Jones, MS, RD who sent me two bags of chips to test. This is not the typical protocol followed by Gluten Free Watchdog but an exception was made in this case.*

*Thank you to Al Klapperich for reviewing this article from the consumer perspective. Thank you to Amy Jones, MS, RD for reviewing this article from the dietitian perspective.*

**Results of testing done by Gluten Free Watchdog usually are available to subscribers only. Subscriptions are fee-based as we have to cover the costs of product, shipping, testing, computer services, etc. If testing of gluten-free products is important to you please consider joining us.**

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