

Safety of Oats for People with Celiac Disease

Background

Celiac Disease (CD) is a multifactorial (polygenic and environmental) immune-mediated gastrointestinal disorder that affects about 1 in 100 to 1 in 133 individuals in North America.^{1,24,25,39} This frequency equates to about 230,000 affected individuals in Canada²⁵ and 2,150,000² in the U.S., for a total of about 2,380,000 in North America. There is very little information on the prevalence of wheat sensitivity in the North American population, but the addition of these individuals could place the total North American population with celiac disease and wheat sensitivities at well over 3,000,000 individuals.

Celiac Disease is characterized by sensitivity to the gliadin component of wheat, barley, rye, triticale, kamut and spelt (WBR) glutens.³ Oats are a more distant cousin, and the storage proteins in them are sufficiently different from those of WBR so that it appears that they are not toxic to people with CD.^{1,11,14} However, because of cross-contamination with WBR during growth, harvesting, transport, storage and processing, oat food products have been off limits to people with CD. Affected individuals have diarrhea, abdominal cramping, pain and abdominal distention. Untreated, CD may lead to vitamin and mineral deficiencies, failure to thrive, delayed puberty, infertility, osteoporosis, etc. Currently the only treatment is complete abstention from WBR for life, and most affected individuals show remission after exclusion of dietary gluten.

Why oats for people with celiac disease?

Studies indicate that:

- Oats increase palatability for people with CD who are otherwise completely restricted in their diets.²²
- Rolled oats and whole oat flour add texture, flavor and fiber to gluten-free baked products made with rice, potato and tapioca flours and starches. When used as the sole source of flour, oat flour gives a firmer, more cohesive and less crumbly textured baked product.²⁸
- In oats, avenin accounts for 10 – 15% of total protein whereas in WBR the protein is 30 – 60 % gliadin.³ The putative amino acid sequence is much less prevalent in avenin than in gliadin and therefore, oats are comparatively better tolerated by the person with CD than are WBR.²⁹
- The injurious agent in WBR, for people with CD, is in the ethanol soluble fraction, the gliadins. This toxicity remains after peptic–tryptic digestion of WBR, but not after such digestion of avenin, which suggests that avenin is not harmful to CD people.

Thus, there is need among people with celiac disease for a source of oats with no cross contamination with wheat, barley, rye, triticale, kamut and spelt, which would significantly improve their quality of life.

Current status of pure, uncontaminated oats:

Until now, there have not been any pure, uncontaminated oats in Canada⁴ or the U.S.,²³ and a recent survey³² of the gluten content in commercially available oat products in the U.S. showed that all are contaminated. While some packages from a particular manufacturer may have acceptably low levels of gluten, others from the same manufacturer do not,³² so CD individuals have not been able to rely on “off-the-shelf” oat products as being safe for consumption. However, a number of European and North American studies conducted over the past 8-10 years have generally shown that moderate amounts of oats are well-tolerated in the diets of both adults^{5-7,10-13,15, 43} and children^{8,9,14,41, 42} with

celiac disease. In-vitro studies have confirmed the validity of clinical studies.²⁶ On the other hand, several studies have suggested that oats can provoke typical symptoms of CD in at least some patients,^{16,18,37} although not in all of them.^{17,31}

In consideration of the above and other information, a number of prominent U.S. medical centres, and North American and UK celiac disease support groups have commented on their web sites about the safety of oats in the diets of people with CD. ☹ indicates no clear position one way or the other.

Medical Centres:

- 👉 Beth Israel Deaconess - http://www.bidmc.harvard.edu/display.asp?node_id=7690&leaf_id=12825
- 👉 Columbia University - www.celiacdiseasecenter.columbia.edu or www.glutenfreeindy.com/newslettersforums/
- 👉 Harvard - www.intelihealth.com/IH/ihtIH/WSHPO000/25792/9681.html#treat
- 👉 Stanford University Medical Center - <http://www.bayareaceliacs.org/pdf/QuickStartDietGuide-2005.pdf>
- ☹ University of Maryland - <http://www.celiaccenter.org/>
- ☹ Mayo Clinic - <http://www.mayoclinic.com/invoke.cfm?objectid=0B50B26D-34AE-4F43-843BDA653DDEF6E3&dsection=8>
- ☹ Yale University School of Medicine - <http://ymghealthinfo.org/content.asp?page=P00361>

Government Bodies:

- 👉 U.S. National Institutes of Health - <http://consensus.nih.gov/2004/2004CeliacDisease118PDF.pdf>

Associations:

- 👉 Canadian Celiac Association - <http://www.celiac.ca/Articles/PAB%20oats%20060313.html>
- 👉 Celiac Disease Foundation - <http://www.celiac.org/cd-main.php>
- 👉 Coeliac UK - <http://www.coeliac.co.uk/>
- 👉 Gluten Intolerance Group - www.gluten.net/diet.html see page 3
- 👉 Dietitians of Canada – DC PEN – Practice-based Evidence in Nutrition (membership)
- ☹ American Dietetic Association - ADA Nutrition Care Manual (membership)
- ☹ North American Society for Pediatric Gastroenterology, Hepatology and Nutrition
http://www.naspgan.org/PDF/PositionPapers/celiac_guideline_2004_jpgn.pdf
- 👉 Celiac Sprue Association (US) - www.csaceliacs.org/InfoonOats.php or www.csaceliacs.org/celiac_treatment.php
- 👉 The Celiac Society of Australia

Individuals:

- 👉 Shelley Case RD – if pure, uncontaminated oats and in moderate amounts
- 👉 Tricia Thompson RD – if uncontaminated oats available I would support inclusion in moderation
- ☹ Cynthia Kupper RD – not widely recommended because of cross-contamination

Most of the organizations, in their expressions of “reservations”, find that the main reason for avoiding oats is because of possible cross-contamination with WBR, implying, if not stating, that if this WBR cross-contamination were removed, moderate amounts of oat consumption should be acceptable for most CD people. In general, those who support the use of moderate amounts of oats by most people with celiac disease suggest a maximum of 50 gm per day for adults³⁸ and 25 gm per day for children.

The American Dietetic Association tentatively concludes that people with CD who choose to eat oats should “limit their consumption to amounts found to be safe in several studies (approximately one half cup of dry whole-grain rolled oats per day)”.^{19,27,35}

However, it should be noted that, while intermediate-term studies (5-10 years) of the effects of oats on people with CD have been started and reported,¹¹ no long-term studies (10-30 years or more) have been completed. Thus, at this time there is no conclusive evidence that oats are safe for consumption by people with CD in the long term, and it should not be assumed that long-term consumption of oats is safe for them.²⁰ Furthermore, because there is a wide range of sensitivity to gluten among people with CD,^{21,24} there will inevitably be some who should not include oats in their diets.

Studies conducted over 6 months on children who ate 24 grams of oats per day did show some decrease in intestinal biopsy score and decreased IEL count.⁹ When 39 people were studied for a period of 1 year with 30 – 50 grams of oats per day there was no change in the villous structure but the GI symptoms increased.¹⁸ This was attributed to cross contamination. There was no stimulus for endomysial antibodies or inflammatory cytokine production. An in-vitro method to assess the immunological evidence to show no harmful effect of oats in people with CD was done revealing no microvilli architectural change, and there was no inflammatory response.²⁶ A very recent 2 year controlled trial with 7 year clinical follow-up in 32 children showed the oats had no detrimental effect on intestinal histology or serology during the 2 year trail⁴². 19 of these children who continued to eat oats were followed up clinically for up to 7 years, with a mean follow-up of 5 years – all remained asymptomatic, had normal development and none was suspected of relapse of CD based on clinical and serological grounds; therefore no additional small bowel biopsies were carried out. A second recent study of 10 patients who ingested 50 g of oats daily for 3 months looked for possible evidence of immune activation. None of the patients developed clinical or laboratory evidence of adverse effects.⁴³ Hence, the authors concluded that moderate amounts of oats could be tolerated.

However, a very recent study of 9 patients who had exposure to uncontaminated oats (50 grams for 12 weeks) did show T cell inflammation.³¹ Oat intolerance can cause complications which could be proven with extended clinical follow up. Monitoring of T cell responses to avenin epitopes may potentially identify individuals who are at risk of developing intolerance. This monitoring will also help in following people with CD who are clinically tolerant to Oats. In studies where withdrawals occurred, most withdrawals were by subjects who found it difficult to follow the diet and most often this was because of a recurrence of symptoms as a result of the oats being contaminated from other sources.⁹ Recent research in celiac disease has been summarized by Robins and Howdle and the National Institutes of Health.^{34,1}

Finally, it is well established that people with celiac disease do want oats in their diets, both for their nutritional contribution (fiber, B vitamins) and for palatability^{22-25,36} reasons. This would result in an improved quality of life.³³ To date, two companies in North America have developed methods to remove contaminating grains from oats.

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